

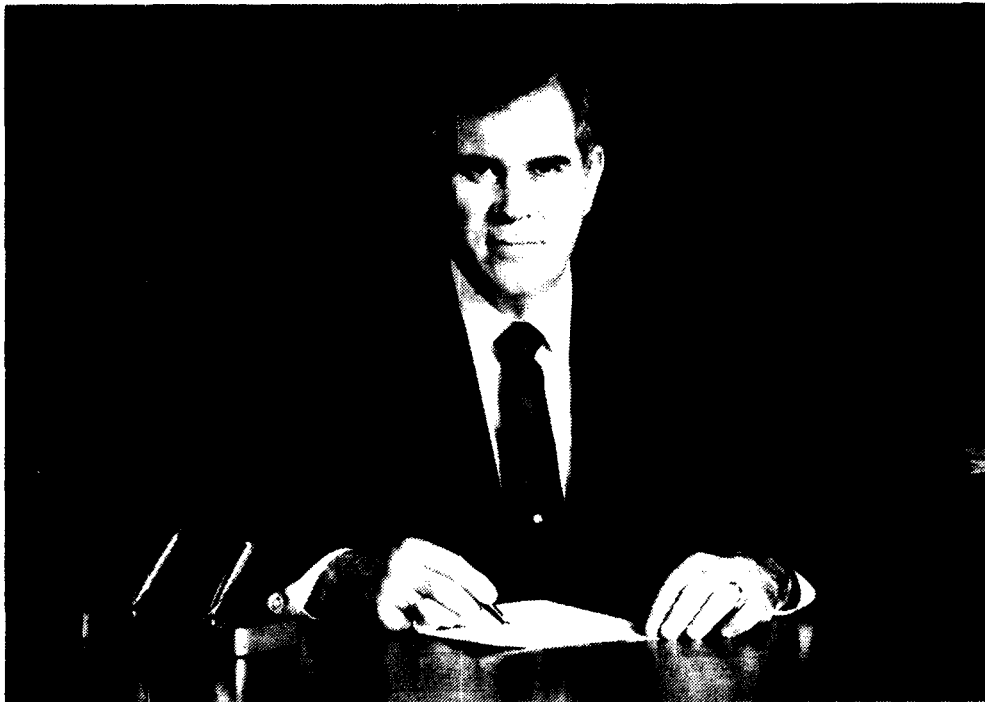
Calendar
1987-88

*Full-time
Trades and
Technology
Diploma
Programs*

**BRITISH COLUMBIA
INSTITUTE OF
TECHNOLOGY**



President's Message



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As the province's only institute of technology and trades, BCIT has a unique place in the post-secondary educational system. Forged out of an amalgamation between the Pacific Vocational Institute and the former B.C. Institute of Technology many of our technical and vocational programs are parallel to none in western Canada.

In fulfilling our mandate since the amalgamation was announced in 1985, we have established new programs, worked at enhancing partnerships with business, industry, and other institutions and made the changes necessary to maintain our reputation for excellence.

In partnership with industry, we have sought out those high technology programs that best reflect the social and economic needs of the country and several of these are now in the process of being implemented as full-time, part-time, or post-diploma programs. Others will come on stream as funding and resources become available. All post basic nursing training in the province is now our responsibility and the School of Health Science has so far incorporated five specialty nursing programs into its curriculum. While we have yet to start bridging programs, we hope in the near future to implement new, innovative programs that will allow bridging from trades to technology.

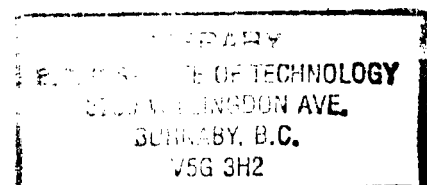
Our partnership with industry has been enhanced this year with the establishment of a new Development Assistance Centre, designed to offer BCIT expertise and resources to companies in problem solving, product development and technology transfer.

Our new Government/Industry Liaison office is also on the way to achieving mutual beneficial links.

In our commitment to excellence we have also undertaken extensive review of our two competency-based programs — TRAC and HITRAC.

As a partner in the community with all those who aspire to life-long learning, we continue to make our educational programs accessible to most adults in the province through transfer programs, satellite campuses, teleconferencing, educational television, interactive video and other communication aids. We invite your participation.

Roy V. Murray
Roy V. Murray
President



Published by: The Community Relations Department
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Changes in Curricula and Regulations

Changes to BCIT's Academic and Administrative structure have been proposed at the time of going to press. Such changes, if they occur, will not materially affect students.

Although it is proposed to adhere to the programs of study as set forth in this calendar, the Institute reserves the right to make, without prior notice, whatever changes are deemed necessary to either the programs of study or the regulations. The Institute reserves the right to cancel any program.

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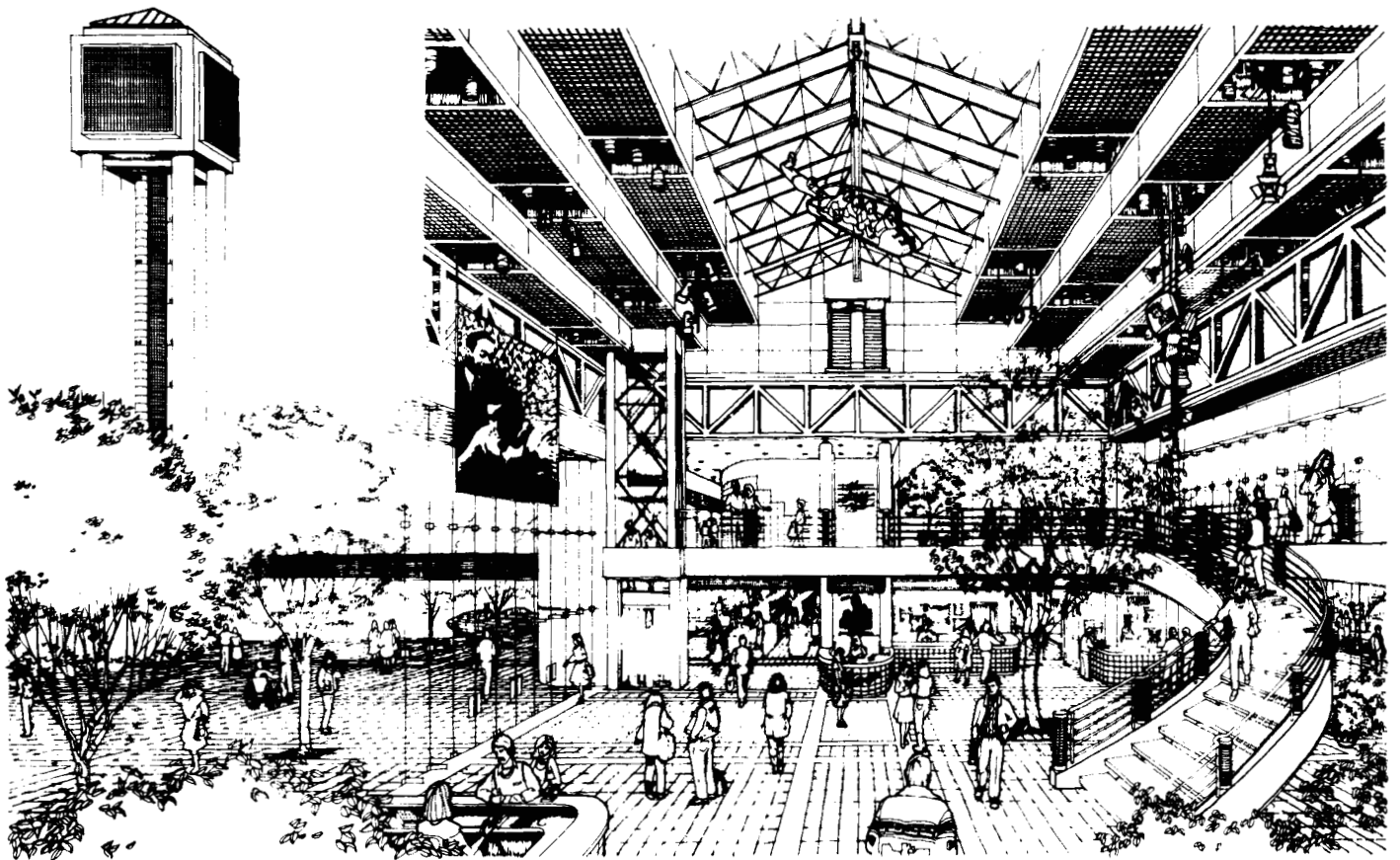
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VIEW OF LOBBY

Proposed new BCIT Campus Centre, 1987.

General Information

Campus Locations

1. Burnaby, Main Campus — Full-time and Part-time Technology and Trades Courses and Programs

3700 Willingdon Avenue
Burnaby, B.C.
V5G 3H2
434-5734 (Campus switchboard)

Important numbers:

Program Advising: 432-8433
Counselling: 432-8433
Financial Aid and Awards: 432-8433
Admissions — Full-time Programs: 432-8419
Registration — Part-time: 434-1610
Student Records: 432-8478

Office hours for most departments are 0830 to 1630, Monday to Friday. Admissions Office hours for general enquiries are 0830 to 1300 Monday to Friday; after 1300, enquiries should be directed to the Registration Office.

Office Hours for Registration and general enquiries — From late August to early December and early January to late April

0830-2030 Monday-Thursday
0830-1630 Friday
0830-1230 Saturday (except holiday weekends)

2. Downtown Education Centre — Part-time Studies Technology Courses only

549 Howe Street
Vancouver, B.C.
V3C 2C6
687-4666

Office Hours — When school is in session

0830-1830 Monday-Thursday
0830-1630 Friday

Otherwise 0830-1730 Monday-Friday

3. Surrey — Part-time Studies Technology Courses only

Princess Margaret Senior Secondary School
12870 72nd Avenue
Surrey, B.C.
V3W 2N1

NOTE: While the Burnaby main campus and Downtown Education Centre offer year-round registration service for part-time studies courses, the Surrey location has limited registration services. Please see our advertising supplements for registration and course details for this location.

4. Sea Island — Aviation courses and programs only

Vancouver International Airport (South)
5301 Airport Rd., South
Richmond, B.C.
278-4831

Personal Data

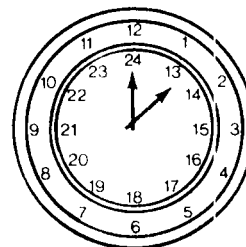
It is the student's responsibility to ensure all personal data on file with the Registrar's Office is accurate.

Refund Deadline

It is the student's responsibility to check the refund deadline dates. This information may be obtained in the Registrar's Office.

BCIT Uses the 24-hour Clock

0001 - 12:01 AM		1300 - 1:00 PM
0100 - 1:00		1400 - 2:00
0200 - 2:00		1500 - 3:00
0300 - 3:00		1600 - 4:00
0400 - 4:00		1700 - 5:00
0500 - 5:00		1800 - 6:00
0600 - 6:00		1900 - 7:00
0700 - 7:00		2000 - 8:00
0800 - 8:00		2100 - 9:00
0900 - 9:00		2200 - 10:00
1000 - 10:00		2300 - 11:00
1100 - 11:00		2400 - 12:00 midnight
1200 - 12:00 noon		



Clean Air Policy

It is the policy of the British Columbia Institute of Technology that a smoke free environment be provided for employees, students and visitors. Smoking is, therefore, restricted to specially designated areas throughout the Institute.

Conduct and Attendance

It is assumed that all students enrolled at the British Columbia Institute of Technology are interested in pursuing an intense program of studies and that they are prepared to conform to all regulations.

1. Students are expected to conduct themselves in exemplary fashion at all times and pay diligent attention to their studies. If the School Dean or the Registrar believes a student's conduct is such that it is detrimental to the interests of the Institute, a recommendation may be made to the President to exclude the student from further attendance. The President has the final power to suspend or expel a student for disciplinary reasons, subject to the student's right to appeal this decision to a committee designated by the Board of Governors. A student who has been expelled or suspended for misconduct will not be admitted to the Institute grounds or buildings.
2. Acts of cheating, plagiarism and dishonesty will not be tolerated by this Institute, and the degree of punitive action may range from a written warning, to a withdrawal from the program. These penalties may also be applied to students who knowingly contribute to the act of dishonesty, cheating and plagiarism.
3. The Institute is not responsible for debts incurred by student organizations.

4. If through carelessness or negligence, a student damages Institute property, the student will be held responsible. If the damage is caused by students whose names are not known, the cost of repairing the damage may be assessed equally among all students enrolled at the Institute.
5. A student will not be permitted to borrow or remove any apparatus or tools except by written authority of the President or his delegate.
6. General supervision over all forms of entertainment given under the auspices of a student organization comes under the jurisdiction of the President.
7. It is the policy of BCIT to rely on the judgement of students to maintain a reasonable standard of dress and appearance. The choice of dress is left to the individual student, subject to the following considerations:

(a) in some field trips and laboratory situations, safety considerations require that special head gear, shoes or other clothing, and other safety equipment must be worn;

(b) where programs involve regular periods of scheduled experience, in industry or hospital for example, the student may be required to wear a uniform or otherwise dress himself/herself in the appropriate manner acceptable to the affiliating agency.

Based on experience to date, BCIT faculty believe that there is a positive relationship between general dress standards and employment of graduates. Faculty are prepared to advise students in the area of acceptable attire.

8. Regular attendance in lectures, seminars and laboratory periods is required of all students. If a student is absent for any cause other than illness for more than 10% of the time prescribed for any subject, he/she may be prohibited from completing the course. In case of illness or other unavoidable cause of absence, the student should communicate immediately with his department head, stating the cause of absence. Special regulations governing attendance in clinical experience areas are prescribed by the School of Health Sciences.

Due to the nature of Trades Training, regular attendance is critical for successful completion. Students failing to report absences to their departments, for five or more consecutive days, may be prohibited from completing the program.

9. Computer Ethics

"Code of Ethics" on Access to Computer Resources at the British Columbia Institute of Technology

In the following statement, a "user" is any person who makes use of any computer owned or operated by BCIT. A "password" is a code word or number which identifies a user to a computer; that is, knowledge of a password which is recognized by a particular computer allows a person to use that computer (just as knowledge of the correct combination allows one to open a safe).

Access to BCIT computer equipment is authorized only for those persons doing work for which that equipment was acquired. Users should be guided by the following:

- a. Do not attempt to discover other users' passwords, or to use any password discovered by chance. Take all reasonable precautions to prevent anyone from discovering your password. Report immediately any suspected "leak" of a pass-

word so that it may be changed. (Where two or more persons use the same password, which may be necessary on group projects, all those persons share responsibility for that password.)

- b. Do not attempt to discover or change any user's charges.

- c. Do not attempt to read or copy any information stored on the computer system unless explicitly authorized to do so. This includes information which has been stored by Computer Resources, by other computer users, by a commercial vendor or by any other party.

- d. Do not knowingly consume excessive resources.

- e. Do not use Institute computer facilities for non-institutional projects, or for personal or commercial purposes, unless written authorization has been received from the Information and Computing Committee.

- f. Do not move any computing equipment, and be extremely careful to avoid damage.

Users of the computer systems are cautioned that violation of the above rules may disrupt service to themselves and others. Furthermore, it could violate a copyright or other non-disclosure agreement into which BCIT has entered.

Computer Resources staff who have access to information owned by users of the system will treat all such information as strictly confidential.

BCIT Board of Governors and Administration

Board of Governors

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President
Mal-Cam Properties

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Collins Manufacturing

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R. Hyde, B.S.A., M.Sc., P.Ag., Dean, School of Construction and Natural Resource Studies
J. Kyle, B.A., M.B.A., Ph.D., Dean, School of Management Studies
R. Sterne, B.A.Sc., M.A.Sc., P.Eng., F.I.M.A., Dean School of Computing and Electro-Mechanical Studies
P. Pick, B.A., M.L.S., Institute Librarian
M. Mazziotti, Dipl.T., Registrar
H. Hyde, B.A., M.A., Coordinator, Student Services
R. Curtis, B.Comm., M.B.A., R.I.A., Director Learning Resources
C.M. Hendy, Ed.Cert., M.A., Ph.D., Director, Co-operative Education, Government and Industry Liaison
R. Bell, Director, Personnel/Employee Relations
D. Hickman, MAIBC, FRAIS, Director, Physical Plant
G. Lloyd, B.Sc., Director, Community Relations
B. Copping, M.D., B.Sc., M.Sc., Director, Medical Services
V. Karpinsky, B.A.(Hons.), Director, Student Housing
J. Mitchell, Director, Recreation and Athletic Services
N. Andrew, C.G.A., Director, Financial Services
W. Hepple, Director, Material Management
I. Nash, B.A., M.A., Manager, Bookstore

Office of the Registrar



The Registrar's Office, Registration, Admissions and Records are located in the 1A Building, 1st floor facing Willingdon Avenue.

Registrar's Office

This office is the Administration centre for all the related activities of the Registrar's office. It directs its efforts towards coordinating the major functions of Registration, Admissions processing, and Records keeping. The personnel in this office are part of a major link in the policy setting and implementation process of the Institute between the Administration, the Deans and the students, particularly as they relate to the student's progress through the Institute, from initial application to the final graduating ceremonies. Students may also utilize this office in the case of an appeal or re-assessment of the marks process. Most of the enrolment statistics published by BCIT are developed by this office. The office has two student information/registration systems. ISIS (for all Technology and Continuing Education students) and SRS (for all Trades students).

Registration

This area is the Institute's first public contact and maintains a high profile for the Institute. This office handles all general information enquiries and accept applications for Trades/Technology programs. Part-time students also register here: over the phone, in person and through the mail. Other activities include processing incoming mail and mailing out information. Office hours are from 0830 to 2030 Monday through Thursday, 0830 to 1630 on Friday, and from 0830 to 1230 on Saturday (except on long weekends).

Admissions

This department accepts and processes applications for full-time Trades and Technologies, and for part-time Electrical, as well as handling enquiries about applications. Office hours for admissions enquiries are 0830 to 1300, Monday to Friday. From 1300 on, enquiries should be directed to the Registration desk.

Records

This office maintains all student files, both full-time and part-time; updates all student file and transcript information; processes all marks and issues transcripts, full and part time, processes verification of attendance letters, loan documents, issues class lists, T2202A forms (Tax Deduction Certificates), assesses students for eligibility to graduate and assists with Convocation, orders and issues all Certificates and Diplomas. It is responsible for academically successful students to be forwarded into their next terms. It processes course credit exemption applications and transfer credit applications for all students. Office hours are 0830 to 1630 Monday to Friday.

Timetabling

The Timetabling Department produces the Institute's master timetables, including those for full-time technology programs, part-time trades and technology programs and full-time technology examinations. Handles day to day room bookings for meetings and other events.

Staff

Mario Mazziotti, Dipl.T., Registrar
Mike Powley, B.Ed., M.B.A., Assistant Registrar (Acting)
Angela Evans, Systems Assistant

Registration

Kelly Durkin, Supervisor, Registration
General enquiries: 434-1610

Admissions

Brenda Walton, Supervisor, Admissions
General enquiries: Trades 432-8229
Technology 432-8419

Student Records

Jeri Fostvelt, Supervisor, Student Records
General enquiries: Trades 432-8228
Technology 432-8478

Timetabling

George Brown, Supervisor, Timetabling
General enquiries: 434-5734 (5386)

Important Dates 1987-88

BCIT is open except on statutory holidays.

Schools of Computing and Electro-Mechanical Studies, Construction and Natural Resource Studies, Health Science Studies, Management Studies and Academic and Vocational Studies

See subsequent pages for Electrical Technology, General Nursing, Medical Laboratory and Diagnostic Medical Sonography.

1987

Mon June 1	Level 2 classes begin for Administrative Management, Financial Management, Computer Systems and Marketing Management Technologies
Fri June 5	Level 2. Fee deadline for Administrative Management, Financial Management, Computer Systems and Marketing Management Technologies
Mon June 15	Last day to apply for course credit exemption
Mon June 15	Last day to withdraw and receive full refund (less \$75)
Wed July 1	CANADA DAY
Fri July 10	Fee Deadline for Level 1 registering September 8
Fri July 24	Last day to withdraw in order to receive "W" on Transcript
Mon Aug 3	B.C. DAY
Mon Aug 10	Fee Deadline for Level 3 registering September 8
Mon-Fri Aug 24-28	Examinations for Level 2 Administrative Management, Financial Management, Computer Systems and Marketing Management Technologies
Mon Sept 7	LABOR DAY
Tues Sept 8	Level 1 and 3 Registration
Wed Sept 9	Level 1 and 3 classes begin
Tues Sept 22	Last day to withdraw to receive a full refund (less \$75)
Tues Sept 22	Last day to apply for course credit exemption
Wed TBA	SHINERAMA
Mon Oct 12	THANKSGIVING
Tues-Wed Oct 13-14	SCHOLARSHIPS (tentative)
Thur Nov 5	Fee Deadline for Level 1 Administrative, Financial and Marketing Management, and Computer Systems Technologies registering January 4, 1988.
Fri Nov 6	Last day to withdraw in order to receive "W" on transcript
Wed Nov 11	REMEMBRANCE DAY
Mon-Fri Dec 7-11	Examinations Levels 1 and 3

Mon Dec 14	Start of CHRISTMAS BREAK for TECHNOLOGY students
Fri Dec 18	Last day of training for TRADES apprentices
Wed Dec 23	Last day of training for TRADES non-apprentice students
Thur Dec 24	School closed
Fri Dec 25	CHRISTMAS DAY
Mon Dec 28	School closed
Thur Dec 31	School closed

1988

Fri Jan 1	NEW YEARS DAY
Mon Jan 4	Level 1 Registration for Administrative, Financial and Marketing Management, and Computer Systems Technologies
Mon Jan 4	All TECHNOLOGY, TRADES CLASSES and apprentices begin
Fri Jan 8	CONVOCATION (Winter)
Fri Jan 8	Term fee deadline for Levels 2 and 4
Mon Jan 18	Last day to withdraw to receive full refund (less \$75)
Mon Jan 18	Last day to apply for Course Credit/Exemption
Mon-Fri TBA	SPRING BREAK for all Technology Students — except Electrical
Fri Apr 1	GOOD FRIDAY
Mon Apr 4	EASTER MONDAY
Tues Apr 5	Last day to withdraw in order to receive "W" on transcript
Mon May 23	VICTORIA DAY
Tues-Fri May 24-27	Examinations Levels 1, 2, and 4
Mon May 30	Level 2 classes begin for Administrative, Financial and Marketing Management and Computer Systems Technologies
Fri June 3	Term Fee Deadline for Level 2
Tues-Wed June 14-15	AWARDS
Thur-Fri June 16-17	CONVOCATION (Spring)

Electrical/Electronics Technology

1987

Wed July 1	CANADA DAY
Fri July 10	Term Fee Deadline for Level 1 registering September 2
Mon Aug 3	B.C. Day
Mon Aug 10	Fee deadline for Level 3 registering September 8
Mon Sept 7	LABOR DAY
*Tues Sept 8	Registration for all Levels; CO-OP 1 and 2 begin
Wed Sept 9	Classes begin for all Levels
Mon Sept 21	Last day to change set
Tues Sept 22	Last day to withdraw in order to receive full refund (less \$75)
Tues Sept 22	Last day to apply for Course Credit/Exemption
Wed TBA	SHINERAMA
Mon Oct 12	THANKSGIVING
Thur Nov 5	Term Fee Deadline for Level 1 registering January 4, 1987
Fri Nov 6	Last day to withdraw in order to receive "W" on transcript
Wed Nov 11	REMEMBRANCE DAY
Mon-Fri Dec 7-11	Examinations all Levels
Mon Dec 14	START OF CHRISTMAS BREAK
Thur Dec 24	School closed
Fri Dec 25	CHRISTMAS DAY
Mon Dec 28	School closed
Thur Dec 31	School closed

1988

Fri Jan 1	NEW YEARS DAY
*Mon-Tues Jan 4-5	Registration for all Levels
Mon Jan 4	Electrical — CO-OP 1 and 2 begin
Wed Jan 6	Classes begin for all Levels
Fri Jan 8	CONVOCATION (winter)
Fri Jan 8	Term Fee Deadline for Levels 2, 4, 5, and CO-OP 1 and 2
Mon Jan 18	Last day to apply for Course Credit/Exemption
Mon Jan 18	Last day to change sets
Tues Jan 19	Last day to withdraw in order to receive full refund (less \$75)
Mon Mar 14	Last day to withdraw in order to receive "W" on transcript
Fri Apr 1	GOOD FRIDAY
Mon Apr 4	EASTER MONDAY
Mon-Fri Apr 11-15	Examinations all levels
Mon May 23	VICTORIA DAY
Tues-Wed June 14-15	AWARDS
Thur-Fri June 16-17	CONVOCATION (Spring)

* Please be advised that the September 1987 and the January 1988 registration procedures and dates could vary.

General Nursing

1987

Mon June 15	Fee Deadline for Term 1 registering August 13
Wed July 1	CANADA DAY
Tues July 14	Fee Deadline for Term 3 registering August 17
Mon Aug 3	B.C. DAY
Thur-Fri Aug 13-14	Term 1 Registration and Orientation
Mon Aug 17	Term 3 and 5 Registration and classes begin
Mon Aug 17	Term 1, 2 and 4 classes begin
Fri Sept 4	Last day to apply for Course Credit/Exemption
Fri Sept 4	Last day to withdraw to receive a full refund (less \$75)
Mon Sept 7	LABOR DAY
Wed TBA	SHINERAMA
Mon Oct 12	THANKSGIVING
Fri Oct 30	Last day to withdraw in order to receive "W" on transcript
Wed Nov 4	Term Fee Deadline for Term 1 registering January 4, 1988
Wed Nov 11	REMEMBRANCE DAY
Fri Dec 4	Term Fee Deadline for Term 3 registering January 4, 1988
Mon-Fri Dec 7-11	Examinations for all Levels
Mon Dec 14	START OF CHRISTMAS BREAK
Thur Dec 24	School closed
Fri Dec 25	CHRISTMAS DAY
Mon Dec 28	School closed
Thur Dec 31	School closed

1988

Fri Jan 1	NEW YEARS DAY
Mon Jan 4	Term 1 Registration and Orientation
Mon Jan 4	Term 3 and 5 Registration, Term 2, 3, 4 and 5 classes begin
Mon Jan 4	Term 2 classes begin
Tues Jan 5	Classes begin for all other levels
Fri Jan 8	Term fee deadline for Terms 2, 4, 5
Fri Jan 8	CONVOCATION (Winter)
Mon Jan 18	Last day to withdraw to receive a full refund (less \$75)
Mon Jan 18	Last day to apply for Course Credit/Exemption
Mon-Fri TBA	SPRING BREAK
Fri Apr 1	GOOD FRIDAY
Mon Apr 4	EASTER MONDAY
Tues Apr 5	Last day to withdraw in order to receive "W" on transcript
Mon May 23	VICTORIA DAY
Tues-Fri May 24-27	Examinations for all Levels
Tues-Wed June 14-15	AWARDS
Thur-Fri June 16-17	CONVOCATION (Spring)

Medical Laboratory Technology

1987

Fri June 5	Term Fee Deadline for Level 1 registering August 4
Wed July 1	CANADA DAY
Mon Aug 3	B.C. DAY
Tues Aug 4	Level 1 Registration
Wed Aug 5	Level 1 Classes begin
Tues Aug 18	Last day to withdraw in order to receive a full refund (less \$75)
Tues Aug 18	Last day to apply for Course Credit/Exemption
Mon Sep 7	LABOR DAY
Wed TBA	SHINERAMA
Mon Oct 12	THANKSGIVING
Fri Oct 23	Last day to withdraw in order to receive "W" on transcript
Wed Nov 11	REMEMBRANCE DAY
Mon-Wed Dec 14-16	Examinations
Mon Dec 21	START OF CHRISTMAS BREAK
Thur Dec 24	School closed
Fri Dec 25	CHRISTMAS DAY
Mon Dec 28	School closed
Thur Dec 31	School closed

1988

Fri Jan 1	NEW YEARS DAY
Mon Jan 4	Level 2 Classes begin
Fri Jan 8	Term Fee Deadline for Level 2
Wed Jan 20	Last day to withdraw in order to receive a full refund (less \$75)
Wed Jan 20	Last day to apply for Course Credit/Exemption
Mon-Fri Mar 14-18	SPRING BREAK
Fri Apr 1	GOOD FRIDAY
Mon Apr 4	EASTER MONDAY
Tues Apr 5	Last day to withdraw in order to receive "W" on transcript
Mon May 23	VICTORIA DAY
Mon-Thurs May 30-June 2	Examinations
Tues-Wed June 14-15	AWARDS
Thur-Fri June 16-17	CONVOCATION (Spring)

Diagnostic Medical Sonography

1987

Mon June 29	Term Fee Deadline for Level 1 registering September 8, 1987
Wed July 1	CANADA DAY
Mon Aug 3	B.C. DAY
Mon Sept 7	LABOR DAY
Tues Sept 8	Level 1 Registration
Wed Sept 9	Level 1 Classes begin
Mon Sept 21	Last day to withdraw to receive full refund (less \$75)
Mon Sept 21	Last day to apply for Course Credit/Exemption
Wed TBA	SHINERAMA
Mon Oct 12	THANKSGIVING

Wed Nov 11	REMEMBRANCE DAY
Fri Nov 13	Last day to withdraw in order to receive "W" on transcript
Mon-Fri Dec 7-11	Examinations
Mon Dec 14	START OF CHRISTMAS BREAK
Thur Dec 24	School closed
Fri Dec 25	CHRISTMAS DAY
Mon Dec 28	School closed
Thur Dec 31	School closed

1988

Fri Jan 1	NEW YEARS DAY
Mon Jan 4	Level 2 Clinical Phase begins
Fri Jan 8	Term Fee Deadline for Level 2
Wed Jan 20	Last day to withdraw to receive a full refund (less \$75)
Wed Jan 20	Last day to apply for Course Credit/Exemption
Fri Apr 1	GOOD FRIDAY
Mon Apr 4	EASTER MONDAY
Mon May 23	VICTORIA DAY
Tues June 5	Last day to withdraw in order to receive "W" on transcript
Fri July 1	CANADA DAY
Mon Aug 1	B.C. DAY
Wed Aug 24	Examination Day

NOTE: There is no summer break for this program.

Medical Radiography

1988

Fri Jan 1	NEW YEARS DAY
Mon Jan 4	Level 1 classes start
Wed Jan 6	Orientation for students Level 1
Fri Jan 8	Term fee deadline for Level 1
Mon Jan 18	Last day to withdraw to receive a full refund (less \$75)
Mon Jan 18	Last day to apply for course credit/exemption
Mon-Fri TBA	SPRING BREAK
Fri Apr 1	GOOD FRIDAY
Mon Apr 4	EASTER MONDAY
Tues Apr 5	Last day to withdraw in order to receive "W" on transcript
Mon May 23	VICTORIA DAY
Tues-Fri May 24-27	Examinations (Level 1)
Mon June 6	Level 2 commences in assigned hospitals
Fri June 10	Term fee deadline for Level 2
Thur June 30	Level 2 assigned hospitals ends
Fri July 1	Summer vacation period
Fri Sept 2	
Mon Sept 5	LABOR DAY
Tues Sept 6	Level 3 commences
Fri Sept 9	Term fee deadline for Level 3
Mon Sept 19	Last day to withdraw to receive a full refund (less \$75)
Mon Sept 19	Last day to apply for course credit/exemption
Mon Nov 7	Last day to withdraw in order to receive a "W" on transcript
Mon-Fri Dec 5-9	Exam week Level 3 (TENTATIVE)

Campus Map



BRITISH COLUMBIA
INSTITUTE OF
TECHNOLOGY
3700 Willingdon Avenue
Burnaby
British Columbia
Canada
V5G 3H2

Campus directory assist.:
(604) 434-5734

Student services:
(604) 432-8433

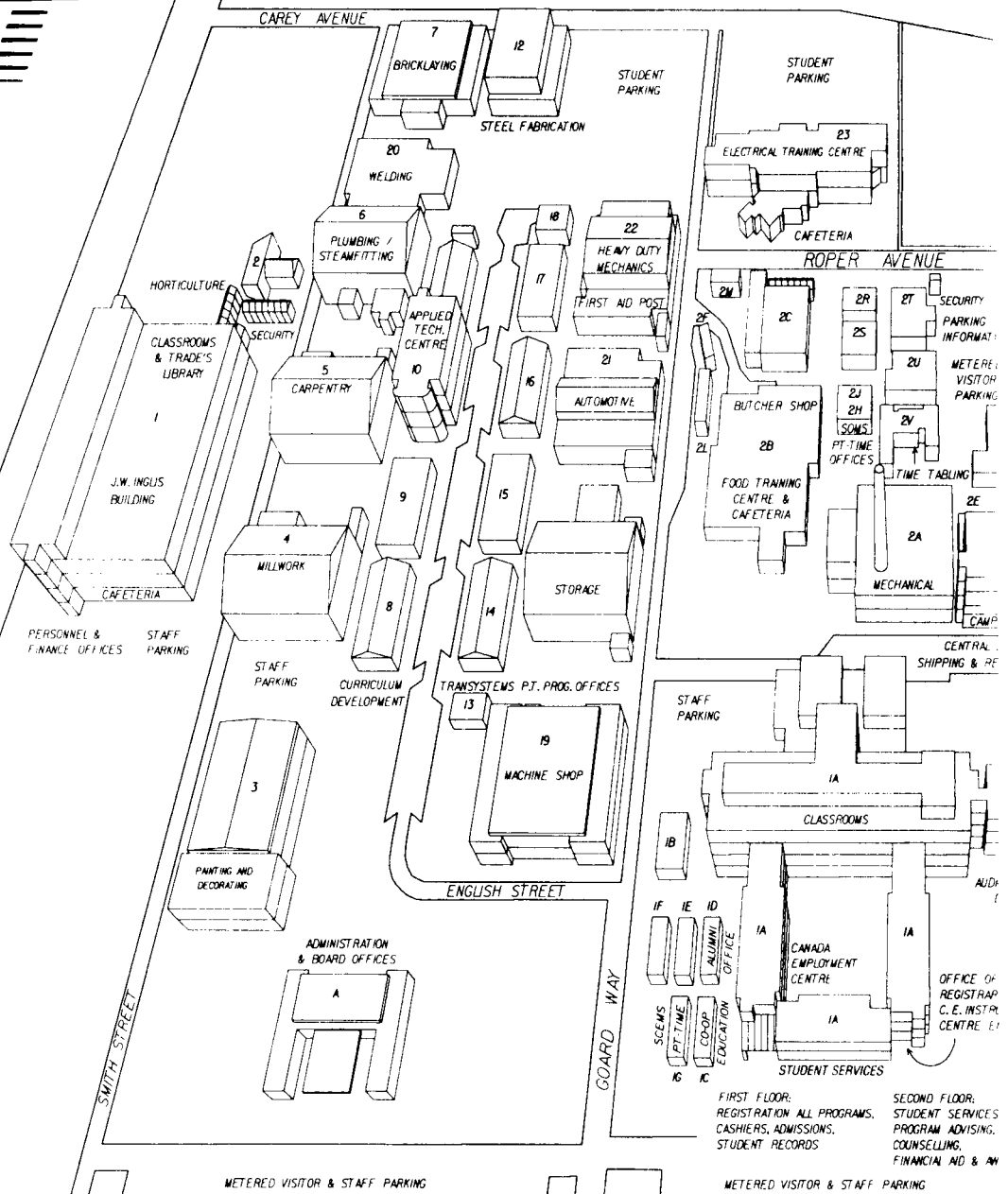
Full-time admissions:
(604) 432-8419

Student records:
(604) 432-8478

Part-time registration:
(604) 434-1610

CAMPUS MAP

Map produced by CAD/CAM department
using the Institute's Intergraph System.
A perspective with hidden lines
removed was generated from a
3 dimensional surface model
of the campus.



CANADA WAY

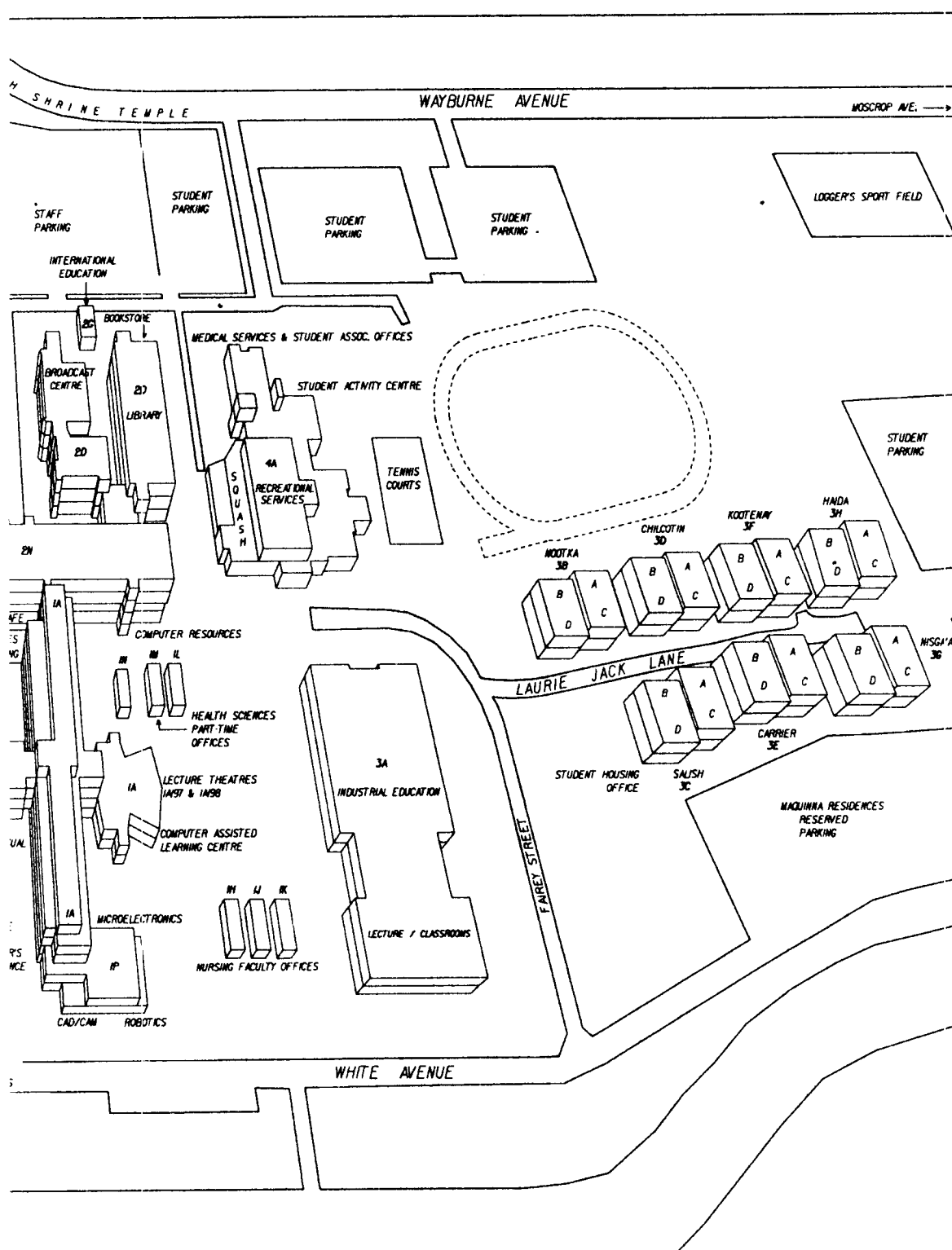
SMITH STREET

ENGLISH STREET

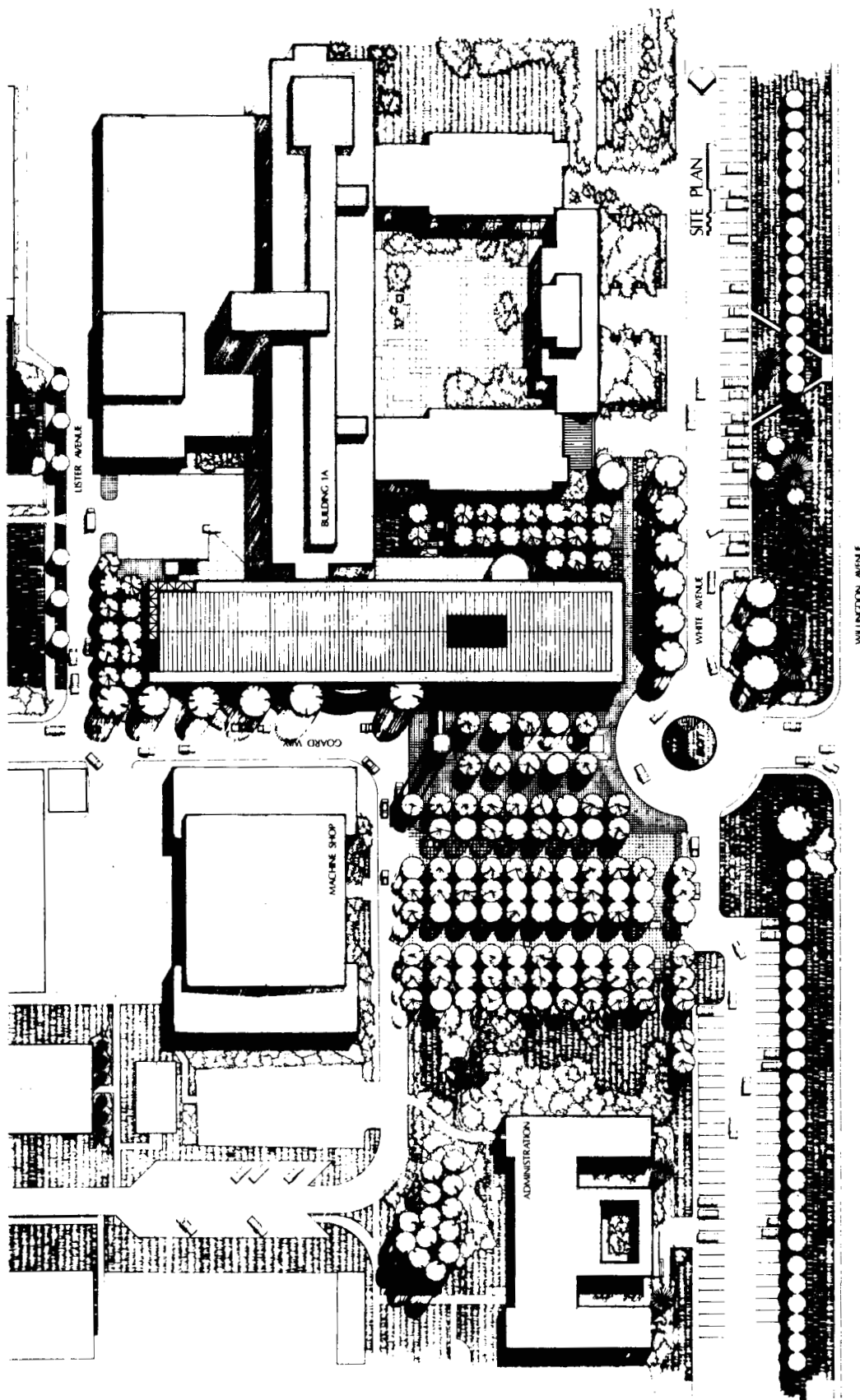
GOARD WAY

WILLINGDON AVENUE

← REDFORD HOUSE, 1850 ROSSER AVENUE & 401 FREEWAY



Administration/Board Offices. A
 Admissions, 1A
 Alumni Office, 1D
 Applied Technology Centre, 1D
 Automotive, 21
 Bakery, 2B
 Bookstore, 2D
 Bricklaying, 7
 Broadcast Centre, 2D
 Butcher Shop, 2B
 CAD/CAM, 1P
 Cafeterias, 1, 1A, 2B, 23, 2C, 2N, 4A
 Campus Cafe, 2N
 Canada Employment Centre, 1A
 Carpentry, 5, 9
 Central Stores, 2N
 Classrooms, 1, 1A, 2N, 3A
 Computer Resources, 2N
 Counselling, 1A
 Co-op Education, 1C
 Curriculum Development, 8
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 Engineering - Computing, Electrical & Mechanical Studies Part-time, 1G
 Engineering - Construction & Natural Resource Studies Part-time, 13
 Financial Aid & Awards, 1A
 Financial Services, 1
 First Aid, 22
 Food Training Centre, 2B
 Full-time Admissions, 1A
 Greenhouse, 2, 2C
 Health Sciences Studies Part-time, 1L, 1M
 Heavy Duty Mechanics, 22
 Horticulture, 2
 Housing Office, Maquinna Res.
 Industrial Education, 3A
 Information, 1A
 Inglis Building, 1
 International Education, 2G
 Library, 1, 2D
 Machine Shop, 19
 Management Studies Part-time, 2H, 2J
 Maquinna Residence
 Mathematics, 1E, 1F
 Mechanical, 2A
 Medical Services, 4A
 Microelectronics, 1P
 Millwork, 4
 Nursing, 1H, 1J, 1K
 Painting & Decorating, 3
 Parking Trailer, 2T
 Part-time (Full-time) Registration, 1A
 Personnel, 1
 Plumbing & Pipefitting, 6
 Program Advising, 1A
 Racquetball, 4A
 Recreational Services, 4A
 Robotics, 1P
 SAC (Student Activity Centre), 4A
 SCEMS Part-time Offices, 1G
 Security, 1, 2T
 SOMS Part-time Offices, 2H, 2J
 Squash, 4A
 Steel Fabrication, 12
 Student Association, 4A
 Student Records, 1A
 Student Services, 1A
 Time Tabling, 2V
 TNT (This 'n That Stores), 1A, 2N, 4A
 Transystems Part-time Offices, 13
 Welding, 20



Proposed new BCIT Campus Centre, 1987.

BCIT Services



Student Services

The Student Services reception area for Program Advising, Counselling and Financial Aid and Awards is located at the North West Corner, Second Floor, Building 1A. Our offices are open from 0830 to 1630, Monday to Friday. For telephone enquiries, please call 432-8433.

Staff

Sheri Dawson, B.A., Reception
Heather Hyde, B.A., M.A., Coordinator, Student Services
Vibeke Jose, Clerical Support
Sandie Mooney, Reception
Jennifer Orum, B.Ed., M.A., Deputy Coordinator, Student Services
Muriel Shaw, Clerical Support

Program Advising

Program Advisors are available for information about courses, learning and career opportunities, for both full and part-time studies. Appropriate referrals may be made in order to best serve students' needs. The Career Resource Centre assists students with program brochures and additional career and occupational information.

Advisors may be seen by appointment or on a drop-in basis, in addition to telephone enquiries.

We are located in the Student Services division, 1-A Building, 2nd Floor where we look forward to hearing from you by telephone, 432-8433, in person, or by mail. Students outside the lower mainland may reach us by using the *HOT LINE* 1-800-242-0676.

Program Advising Staff

Pat Awarau, B.A., Program Advisor
Anne Bullinger, Program Advisor
Ann McNaughton, Cert., Program Advisor
Raelene Rowe, B.A., Coordinator, Program Advisor

Program Advising Staff — Part-time Studies

Chris Lloyd, Dipl.T., Program Advisor, Part-time Studies, School of Management Studies

Program Advisor, Part-time Studies, Schools of Computing and Electro-Mechanical Studies, Construction and Natural Resource Studies

Counselling

Counselling Services offer a free and confidential career counselling service to all current and prospective BCIT students. Professionally trained counsellors will assist students in selecting a career, making a career change, re-entering the work force, or adjusting a career to fit a chosen lifestyle.

Current and prospective students are invited to drop in to the Career Resource Centre in the counselling office to view slide and tape presentations of various BCIT trades and technologies, or to pick up brochures on each trade and technology. There are reference materials to assist you in your educational and lifestyle planning as well as calendars from other Canadian and U.S. post-secondary institutions and universities. There is also a special section devoted to women's issues.

Counselling Services, in conjunction with Part-time Studies, offers several Career Search Workshops during the school year. These workshops are four sessions (12 hours) long and are designed primarily for prospective students who have been in the work force at least two years. Participants examine their career paths and lifestyles in terms of direction and personal satisfaction. Registration for Career Search Workshops is handled through Part-time Studies at 434-1610. Currently, this is the only standardized testing package available to the general public.

BCIT students may receive assistance in overcoming blocks to successful educational performance to optimize learning efficiency and effectiveness. Supportive counselling to BCIT students during times of stress or change is also available through Counselling Services. It may take the form of direct service to the student, referral to the appropriate campus service or community agency.

The Special Needs Counsellor provides persons with disabilities and special needs with career, educational and personal counselling assistance. The Special Needs Counsellor also coordinates services for these students and facilitates their participation in training.

The Women's Access Consultant assists enrolled and prospective women students to access and participate in non-traditional trades, technician and technology training. 'Non-traditional' training refers to any occupation where women currently hold fewer than 10 percent of the available jobs. The Women's Access Consultant identifies services and resources available at BCIT and in the community that facilitate and enhance opportunities for women training in non-traditional occupations.

Group Workshops for BCIT students are offered from time-to-time throughout the year.

Prospective students should make appointments to attend group information sessions prior to booking an individual appointment.

For further information about any of the Counselling Services at BCIT, contact Student Services reception, in Building 1A, 2nd floor, or telephone 432-8433.

Counselling Staff

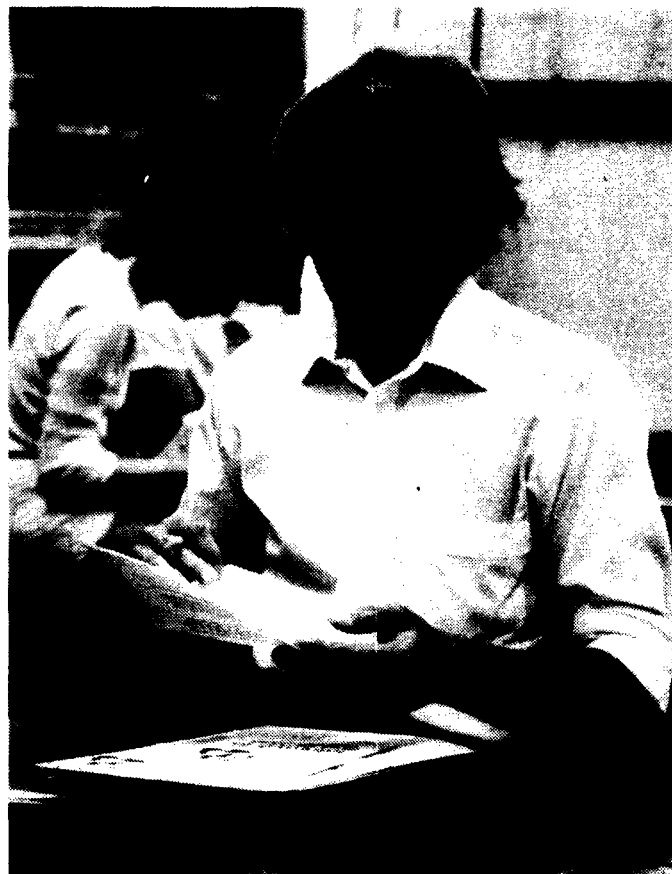
Stu Gibbs, B.A., M.S.Ed., Counsellor
 Norma Hawkes, B.A., M.Ed., D.Ed., Counsellor/Coordinator, Counselling
 Heather Hyde, B.A., M.A., Counsellor/Coordinator, Student Services
 Howard Peto, B.S.A., M.Ed., Counsellor
 Jean Spence, B.A., M.Ed., Special Needs Counsellor
 Brenda Pengelly, B.A., Women's Access Consultant

Financial Aid and Awards

The most important point to remember when considering educational finances is to plan ahead. For this reason you are urged to investigate the financial assistance programs available, and explore other options well before the start of a new school year.

How Much Will It Cost

The first step in determining your total financial picture is to calculate resources and expenses. In addition to tuition fees and book/supply costs, single students not living with their parents can expect to spend approximately \$600.00 per month on living expenses. It is important that costs such as rent, food,



utilities, transportation, clothing, laundry and entertainment are taken into account. To estimate total resources, you should consider such items as savings, parental contribution and part-time earnings while attending school.

If your estimated expenses exceed your total resources, please consider the following programs and services available at BCIT. (Note: These programs and services are subject to change).

B.C. Student Assistance Program

This government sponsored program is the major source of financial assistance for post-secondary students. The maximum assistance a student is eligible for varies according to program length and whether a student is single, married or has dependents. Based on 1986/87 guidelines, the maximum available for a single student or a married student without children is as follows:

PROGRAM/YEAR LENGTH (WEEKS)	CANADA STUDENT LOAN MAXIMUM	B.C. STUDENT LOAN MAXIMUM	TOTAL LOAN MAXIMUM
12	\$1260	\$ 700	\$1960
18	\$1890	\$1050	\$2940
22	\$2310	\$1285	\$3595
30	\$3150	\$1755	\$4905
36	\$3780	\$2000	\$5780
39	\$4095	\$2000	\$6095
43	\$4515	\$2000	\$6515
52	\$5460	\$2000	\$7460

The maximums for single parents and married students with children are slightly higher. **Please note:** These figures are maximums — the amount a student actually receives is determined by an assessment of their financial circumstances. Students who require funds at the beginning of the program/year should apply at least 3 months before the start of classes.



Work Study Program

The Work Study Program is a government sponsored program designed to provide on-campus, part-time work for students in financial need. This program is intended for students whose financial needs cannot be fully met by the B.C. Student Assistance Program, or for those who wish to reduce the amount of their student loans. Many of the positions provide career related work experience, and the hours are generally flexible so as not to interfere with classes. Positions are posted at the Canada Employment Centre beginning in September.

CIT Bursaries

CIT bursaries are non-repayable awards ranging from \$100 to \$1,000. They are made possible through contributions from private companies, organizations and individuals, to the BCIT Scholarship and Bursary Fund. A description of available bursaries can be found in the booklet "BCIT Student Awards and Financial Aid", copies of which may be obtained from the Student Services Reception desk.

To be considered for a bursary, students must demonstrate financial need and have satisfactory academic standing. In some cases consideration is also given to the student's contribution to BCIT and/or the community. Technology students cannot apply for a bursary until they have successfully completed one term at BCIT. An application must be submitted with the normal deadline being the third week in January. Vocational students must also complete an application to be considered for bursaries. The deadline is the 29th of each month.

BCIT Technology Scholarships

Based on first year performance, scholarships are presented to full-time technology students entering second year. Presentations are made at the October Scholarship Ceremonies. These awards are automatic with no application necessary. A complete list of scholarships can be found in the BCIT Awards and Financial Aid booklet.

Emergency Loans

Short-term, interest-free emergency loans are available, in some circumstances, to assist students in meeting essential living and educational expenses. Students are expected to have exhausted all other possible financial resources, including family loans, before being considered for an emergency loan. These loans are normally granted to students who are able to repay them from a specified source within a short time period.

For further information, telephone 432-8433 or visit the Student Services Reception desk located at the northwest corner, second floor, Building 1A. Hours are 08:30 to 16:30, Monday to Friday.

Staff

Jennifer Orum, B.Ed., M.A., Coordinator
 Jim Anderson, B.A., Senior Advisor
 Cathy Schweers, Advisor
 Angie Chan, Senior Financial Aid Assistant
 Hanne Logan, Financial Aid Assistant
 Mary-Ann Moysiuk, Financial Aid Assistant

Graduating Awards

Honor Awards

The following Honor Awards are presented at convocation.

The **Governor General's Silver Medal** is presented to the top academic student in a Technology Diploma Program. Graduates from the previous August Nuclear Medicine class are also considered, as are August and December graduates from the Electrical/Electronics Technology and December graduates from Nursing.

The **Lieutenant Governor's Silver Medals** are awarded for academic excellence and contribution to both the Institute and the community at large. Two are presented each year, one to a Trades program graduate and the other to a graduate of a Certificate Program.

The **Board of Governors' Citizenship Award** is presented to the graduating student who has a record of active participation in student activities, a reputation for mature personal relations with both staff and students, and reasonable academic standing.

The **President's Award** is presented to a student who has demonstrated outstanding leadership and service to peers, faculty and staff and who has achieved at least a second class standing.

The **Dean's Awards** are presented to the most outstanding academic students in each of the four Schools: Computer and Electro-Mechanical Studies, Construction and Natural Resource Studies, Health Science Studies and Management Studies.

Academic Awards

Academic Awards are presented annually to students who achieve the highest academic standing in their programs of studies. The following awards were presented at the June 1986 Graduating Awards Ceremony.

School of Computing and Electro-Mechanical Studies

CAD/CAM

Intergraph Systems Limited Award

Computer Systems

The Computer Systems Award in Information Systems
The Computer Systems Award in Management Systems
The Computer Systems Award in Microcomputer Systems
The Computer Systems Award in Expert Systems
The Computer Systems Award in Engineering Systems

Electrical/Electronics

The Microtel Pacific Research Award in Telecommunications
The Federal Pioneer Limited Award in Power
The Instrument Society of America Award in Instrumentation
The MacDonald, Dettwiler and Associates Limited Award in Control Electronics
The Microelectronics Graduating Award

Mechanical

The Canadian Manufacturers' Association Award in Production
The Canadian Society for Mechanical Engineering Award in Design
The Mechanical Contractors Association of B.C. Award in Mechanical Systems



School of Construction and Natural Resource Studies

Biological Sciences

The B.C. Federation of Agriculture R.B. Stocks Award in Agriculture
The B.C. Nursery Trades Association Award in Landscape Horticulture
The Canadian Agricultural Chemicals Association, B.C. Section Awards in Food Production
The Fisheries Council of B.C. Award in Food Processing

Building

The Architectural Institute of British Columbia Award in Architecture
The Building Award in Economics

Civil and Structural

The Swan Wooster Engineering Company Limited, Col. W.G. Swan Award

Surveying

The BCLS — George New Compass Award

Forest Resource

The Council of Forest Industries Award in Forestry
The Fish, Wildlife and Recreation Graduating Award

Lumber and Plywood

The Council of Forest Industries Award in Lumber and Plywood

Mining

The Canadian Institute of Mining and Metallurgy, Vancouver Branch Award

Natural Gas and Petroleum

The Westcoast Transmission Company Ltd. Award

Chemical Sciences

The Canadian Institute of Mining and Metallurgy Award in Extractive Metallurgy
The Canadian Pulp and Paper Association Award
The Canadian Society for Chemical Technology Award in Organic Chemistry
The Chemical Sciences Award in Pollution Science
The Chemical Sciences Award in Physical Metallurgy

School Awards

The BCIT Alumni Award

School of Health Science Studies

Biomedical Electronics

The Biomedical Electronics Graduating Award
The Electrophysiology Graduating Award

Environmental Health

The Environmental Health Graduating Award

Health Information

The Health Record Association of B.C. Award in the Health Record Administrator Program
The Health Record Association of B.C. Award in the Health Record Technician Program

Medical Laboratory

The B.C. Society of Medical Technologists Award

Medical Radiography

The B.C. Radiological Society Award

Nuclear Medicine Technology

The Frosst Radiopharmaceuticals, Ralph Jamieson Award

Occupational Health and Safety

The Occupational Health and Safety Award

Prosthetics and Orthotics

The J.A. Pentland Ltd. Award

General Nursing

The W.B. Saunders Co. Canada Ltd. Award

School of Management Studies

Administrative Management Systems

The Bank of British Columbia Award in Administrative Systems
The Finning Tractor and Equipment Co. Ltd. Award in Personnel and Industrial Relations Administration
The Business Administration Double Diploma Award

Broadcast Communications

The British Columbia Association of Broadcasters Award

Financial Management

The Canadian Life Insurance Association Awards
The Society of Management Accountants of British Columbia Award in Accounting
The Royal Bank Finance Award

Hospitality and Tourism Administration

The British Columbia Hotels' Association Award in Hotel, Motel and Food Service Management
The Ryan Schlyecheer Memorial Award in Travel and Tourism

Marketing Management

The Real Estate Council of British Columbia Award in Real Estate Studies
The Vancouver Sun and Vancouver Province Award in Technical

Sales and Marketing

The Canadian Tire Award in Advertising and Sales Promotion

Operations Management

The Vancouver Transportation Club Award in Transportation and Distribution Management
The Transportation and Distribution Program Faculty Award of Excellence
The Bank of British Columbia Award in International Business
The Operations Management Program Faculty Award of Excellence

Achievement Awards

Institute Awards

The Applied Science Technologists and Technicians of British Columbia - President's Award of Excellence
BCIT Mathematics Department Book Prize

School of Computing and Electro-Mechanical Studies

Electrical/Electronics

The Teleglobe Canada Award in Telecommunications
The Western Canada Telecommunications Council, R.C. Eldridge Award in Technical Writing

Mechanical

The Institution of Mechanical Engineers, Western Canada Branch, Commander S.M. Terry Memorial Award
H.A. Simons (International) Ltd. Award
The Wright Engineers Ltd. Award

School of Construction and Natural Resource Studies

Biological Sciences

The B.C. Food Technologists Award in Food Processing

Building

The Clay Brick Association of Canada Award
The P.B. Ford and Company Award
The Royal Institution of Chartered Surveyors, B.C. Group Award
The Quantity Surveyors Society of B.C. Award
The Isabel Verner Memorial Book Prize
Construction Specifications Canada (Vancouver Chapter) Special Projects Award

Civil and Structural

The Dillingham Construction Ltd. Award
The Dominion Construction Co Ltd. Award
The Wright Engineers Ltd. Award
The Associated Engineering Services Ltd. Award

Surveying

The Dillingham Construction Ltd. Award
The Canadian Institute of Surveying Membership Award

Forest Resource

The Canadian Institute of Forestry, Vancouver Section

Lumber and Plywood

The Ralph S. Plant Ltd. Award

Chemical Sciences

The Canadian Pulp and Paper Association Award
The Can Test Limited Award in Organic Chemistry
The Analytical Service Laboratories Limited Award in Pollution Science

School of Health Science Studies

Environmental Health

The Environmental Health Award

Medical Laboratory

The Coulter Electronics of Canada Award in Haematology

The Metropolitan Clinical Laboratories Ltd. Award in Clinical Chemistry

The Metropolitan Clinical Laboratories Ltd. Award in Clinical Microbiology

The Ortho Diagnostic Award in Immunohaematology

The Sherwood Medical Industries Inc., Paraplast Award in Histotechnology

The Organon Teknika Award in General Proficiency

Nuclear Medicine Technology

The Metropolitan Clinical Laboratories Ltd. Award for Clinical Excellence

General Nursing

The Department Head's Prize for Excellence in Bedside Nursing

School Awards

The School of Health Science Studies Prize

The BCIT Alumni Award

School of Management Studies

Administrative Management Systems

The Westcoast Transmission Company Ltd. Awards

The Administrative Management Systems Students' Award

The National Real Estate Service Award

Broadcast Communications

The British Columbia Film Industry Association, Jack Gettles Memorial Award for Creativity in Television

The Broadcast Communications Commercial Production Awards of Excellence

The Rogers Cable T.V. — Vancouver Award of Excellence in Broadcast Engineering

The Canadian Broadcasting Corporation Award in Television

The Gastown Productions Award in Television

Financial Management

The Certified General Accountants Association of B.C. Awards

The Financial Executives Institute, Vancouver Chapter Award

The Institute of Chartered Accountants of B.C. Award

The Financial Management Faculty Award in Finance

Hospitality and Tourism Administration

The Sunational Vacations Limited Award in Travel and Tourism

The White Spot Ltd. Awards in Hotel, Motel and Food Service Administration

Marketing Management

The National Real Estate Service Award

Operations Management

The Canadian Association for Production and Inventory Control, Vancouver Chapter Awards

School Awards

The BCIT Alumni Award



International Education

Life at BCIT has acquired an international flavour with the increasing enrolment of international students. This year BCIT is host to nearly 90 students from other countries. The presence of international students on campus provides an excellent opportunity for intellectual and cultural interaction.

The International Education Office provides services to international students at BCIT and coordinates other international activities at the Institute. The office is located in Trailer 2G, just north of the Bookstore. Telephone: 432-8475.



International students.

Co-operative Education Government and Industry Liaison

Martin Hendy, Ph.D., Director. Telephone 432-8590
Kerry Jothen, M.A., Coordinator, Government and Industry Liaison. Telephone 432-8471
Ernst Wilmink, B.P.E., Coordinator, Co-operative Education. Telephone 432-8499
Gino Simeoni, M.Ed., Coordinator, Co-operative Education. Telephone 432-8291

One of the aims of this office is to increase the responsiveness of the Institute to government and industry in general. More specifically, the office acts as a focal point and will either give information or make a referral to the appropriate person(s). It promotes BCIT programs and services to government and industry; identifies and assists in accessing government funding for industry and BCIT departments; and promotes Institute/government/industry collaboration.

BCIT currently offers Co-operative Education only to technology students in Electrical/Electronics. Programs in other technologies and in the trades are being considered. For more information contact the Director.



The Cooperative Plan

Cooperative Education is a plan of education which integrates paid work experience with academic studies. The name reflects the cooperative relationship between BCIT, students and employers. The employment relates to the student's field of study.

Many students take a job or jobs to finance their education but often the job is no more than a means to that end. In addition to helping students finance their education, Co-operative Education allows students to explore their career choices in a structured and purposeful manner. It gives them the opportunity to test skills and knowledge learned on campus, to adjust to the world of work, to acquire relevant experience as well as an education.

Operation of the Plan

Responsibility for the operation for the plan rests with the Co-operative Education Coordinators. They meet employers to establish and maintain jobs and determine future requirements for students. They counsel students, deal with any problems which may arise, and liaise with faculty members from the academic department who visit students on the job and evaluate the reports submitted at the end of work semesters.

Admission to the Co-operative Program

Co-operative Education at BCIT is selective. Selection is based upon academic performance and an interview. At the interview such factors as motivation, inter-personal and communication skills are checked. To enter and to continue in a Co-operative program a student must normally have a cumulative grade point average of 60% and no more than one failed course up through level three. Students should make application for admission to the Co-operative program at the beginning of their third study semester. Transfer students, especially those transferring from other co-operative programs, should consult the Director at the earliest opportunity.

Under Canada immigration regulations relating to employment, only Canadian citizens and permanent residents are eligible to enter a Co-operative Education program.

WORK STUDY SEQUENCE

Year 1			Year 2			Year 3			Year 4		
SEP DEC	JAN APR	MAY AUG	SEP DEC	JAN APR	MAY AUG	SEP DEC	JAN APR	MAY AUG	SEP DEC	JAN APR	MAY AUG
SI	S2 S1	H H	S3 S2	W1 S3	W2/H W1	S4 S4	S5/W2 W2	W3/H W3/H	S5 S5		

Key S1 = 1st study semester
W1 = 1st work semester
H = holiday or non-coop job

Notes: 1. Where there is a choice, e.g., W2/H, the preferred choice is first.
2. This diagram is for 1987 only and subject to change.

The diagram shows the alternating pattern of work and study semesters required in Co-operative Education programs at BCIT. Normally, each work semester is of 13 to 16 weeks duration. Vacation time for students between work and study semesters will vary from one to four weeks according to personal choice and by arrangement with the employer.

The Job Competition

The job competition takes place during the second half of the semester prior to the work semester. Initially, employers indicate the number and type of students required and provide job descriptions. The job descriptions provided by the employers are displayed for Co-operative Education students who may apply for up to ten interviews, selecting the opportunities that offer the types of experience they are seeking.

Applicants' resumes and academic records are sent to employers who may then elect to interview all or some of the applicants. After the individual interviews, which are normally held on campus, employers prepare a list in order of preference of students who are acceptable for the job. Students also state their order of preference for the employers with whom they have had interviews. These two sets of choices are combined to effect the best possible match of employers and students.

The Institute then contacts employers informing them of the students obtained through the selection process. Students then write confirming their acceptance of employment and include any details that they may wish to discuss in advance of reporting for their jobs.

Registration in a Co-operative Education program at BCIT commits students to the acceptance of employment either through the regular job competition or, where it would be to a student's advantage, on an assignment that their Coordinator may determine. Students with a job available to them outside this procedure must have the job evaluated by their Coordinator. All positions held by students must be approved by the Director of Co-operative Education.

By registering in a Co-operative Education program, students give permission for the release to prospective employers of copies of their academic records and, when applicable, previous employer evaluations.

Under the procedure described above, there may be some students who do not secure a job and some employers who do not obtain students. In such cases the Institute makes every effort to place these students and to satisfy the employers where the best interests of each can be served.

Co-operative Education students are expected to return for a second work semester when acceptable to employers. Second work semesters provide students with an opportunity for better assessment of the employer and provide employers with the benefit of increased productivity. In most instances, the second work semester also offers students some new duties and responsibilities. Valid reasons for exceptions to this rule will be considered by the Coordinator. Additional work semesters are a matter of mutual agreement between employers, students and the Coordinator.

Pay Rates

Rates of pay for Co-operative Education students are determined by employers within their own wage or salary structure. As students progress through their programs and assume more responsibility on work assignments, it is expected that their rates will increase as merited. In order to aid employers in establishing or reviewing pay scales, the Institute completes an anonymous pay rate survey each work semester. Averages obtained from these surveys are then made available to both employers and students.

Fees

During study semesters, Co-operative Education students are expected to be full-time students, and are assessed according to the regular fee schedule. During work semesters, Co-operative Education students are formally registered in a job practicum course; they are assessed course fees equivalent to one-half of those assessed for general tuition, the "off-campus" Student Activity Fee, and special fees if appropriate.

Evaluation

Students are required to prepare a work report on their employment during each work semester. This provides experience in the preparation of written reports similar to those which an employer expects from a responsible staff member. The work report is evaluated as satisfactory or unsatisfactory by a member of the faculty, and perhaps by the employer also.

Regular performance evaluation is provided by the employer during the job period and formally on the evaluation form provided by the Institute. This form asks for ratings of specific characteristics and an overall performance rating. Employers discuss their final evaluation with the student at an exit interview; it is reviewed by student and Coordinator upon return to campus.

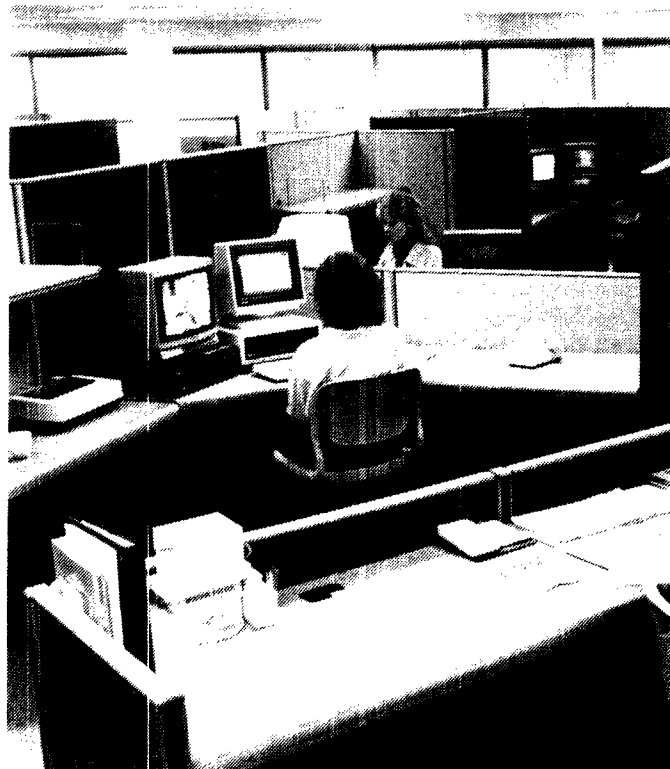
During each work semester, each student is visited, when practicable, by a Coordinator or other faculty member. Meetings such as these afford the opportunity for a frank exchange of views with the student and employer on all aspects of the job and the student's performance.

The co-op work semesters are graded on a Satisfactory/Unsatisfactory (S/U) basis.

Graduation Requirements

In addition to the normal academic requirements, satisfactory work reports and work semesters are required for graduation from a Co-operative Education program. Unsatisfactory work

reports may be improved, or new ones submitted. Each job work semester must be completed with a grade of S for a student to remain in good standing in the Co-operative Education program. A student's academic record shows completion of each work semester, and 15 hours of academic credit is given for each of them. Students completing all the requirements of a Co-operative Education program will receive a "Co-operative Education" designation on their academic record and on their diploma.



Open Education Access Center

This microcomputer auto tutorial training center is designed to provide career skills to adults in business application programs. Learners select a time frame that suits their needs and learning is self paced.

The center is equipped with 16 skill stations that include IBM compatible PC's and video disc players. Professional proctors are available to assist you with your progress.

The center focus is on career skills development, small business. Managerial upgrading and employment training.

Available courses include:

BOS (Basic Operating Skills) 3 hour lecture, 12 hours hands on exercises. A course designed for people with little or no micro-computer experience. **CAT** (Computer Aided Training) 15 hours computer time with courseware. Courseware includes; Lotus 123, dBASE III, Multimate, the PFS Family of chart, graph, plan and write, Auto Cad, Bedford and PC Write.

A software library is available for users to review programs.

The center is also available for private, individual or company training on a per station, per hour basis and can incorporate training programs.

The center is located at 145 Chadwick Court, next to the North Shore Sea Bus terminal and Lonsdale Quay. Please phone 987-4671 for additional information between noon and 8 p.m. weekdays and noon to 4 p.m. weekends.

Library Services

The BCIT library system is one of the province's major centres for technological and trades information, serving curricular needs of the Institute as well as providing general support to business and industry in British Columbia. Library holdings include over 200,000 volumes of books, periodicals, pamphlets, maps, micro-computer software, films, videos and kits. Major strengths are found in the collections of technical reports, standards, and Statistics Canada. The listening and viewing area of the main library houses preview booths, slide tape units, video monitors, microform viewers and microcomputers.

The 2-year programs provide five hours a week for library use and research. Professional staff give instruction in library research skills. The opportunity to become familiar with key information sources in a chosen field assists students not only in completing course assignments but also in facing the challenge of keeping current in a changing work environment. As well as individual and group instruction, there are printed guides to various information sources, facilities and services.

BCIT students use computer terminals in the libraries to access DOBIS, the complete on-line catalogue of holdings. This is the first integrated on-line library system in the province to serve an academic community. A courier service delivers library materials between Sea Island and the Burnaby campus.

Book Replacement Fee

A non-refundable fee is levied for overdue material that is not returned. The fee covers the purchase and processing of a replacement copy and is payable to the BCIT Finance office. No statement of marks, diploma or certificate is issued until the student settles all financial obligations for overdue material. Overdue loans result in the blocking of further loan transactions.

Quick Facts about the Library Services Division

Library Hours:

September-May (subject to change)

Main Library

Monday-Thursday	0730-2230
Friday	0730-1700
Saturday and Sunday	0900-1700

Inglis Library

Monday-Friday	Check for times
Summer hours vary	Check for times

Learning Centre hours: (subject to change)

South Campus, Burnaby

Monday-Thursday	0800-2000
Friday	0800-1600

North Campus, Burnaby,

Monday-Friday	Check for times
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Faculty and Staff

Paula C. Pick, B.A., M.L.S., Institute Librarian
 Margot Allingham, B.A., M.L.S., Reference Librarian
 Sheila Ferry, B.A., B.L.S., Reference Librarian
 Frank Knor, Dipl.T., B.Ed., B.L.S., Multi-campus Coordinator
 Merilee MacKinnon, B.A., M.L.S., Head Cataloguer/DOBIS Project Leader
 Robert A. Roy, B.A., M.A., B.L.S., Public/Technical Services Coordinator
 Gerry Weeks, B.A., M.L.S., Information Service Coordinator
 Nini McPhail, B.Sc., Lib.Tech.Dip., Inglis Library

Medical Services

A three-bed Medical Services unit, located in the Student Activity Centre, is staffed by physicians and nurses Monday through Friday, 0830 - 1630, and offers the same services as any doctor's office. A doctor is on call after hours, and Burnaby Hospital is ten minutes from campus. A psychiatrist and physiotherapist are also available. All visits are strictly confidential.

All patients who wish to see a doctor must have valid medical coverage; B.C. students can either have their own coverage or, if under 25, apply to remain on their parents' plans. Out of Province students may use their own Provincial Health Plans. Foreign students studying on student visas must have private medical insurance. Application forms for the Medical Services Plan of B.C. (and information on premium assistance for eligible, low-income students), and application forms for private medical coverage for travel, extended care, etc., are available in Medical Services. Emergencies are always seen.

Some medication is dispensed free of charge and most immunizations are free. Prescribed allergy shots can be given. There is no dentist on staff, but Medical Services can usually assist with dental referrals.

No appointment is needed to visit Medical Services except in the case of a complete physical examination. Referral to either the physiotherapist or the psychiatrist is through Medical Services or your own physician. The physiotherapist's office is adjacent to the Medical Services facility. For more information on Medical Services please visit us or call 432-8608.

Staff

Barbara E. Copping, B.Sc., M.Sc., M.D., Director-Physician
 David Mullard, M.B., B.S., Physician (part-time)
 Jacqueline Hurst, B.Sc., M.D., Physician (part-time)
 David Fung, M.B., B.Ch., F.R.C.P(C), Psychiatrist (part-time)
 Ralph, Wyatt, B.A., B.S.R., Physiotherapist
 James Morrow, R.N., Nurse
 Louise Baker, R.N., Nurse (part time)
 Millie Linnen, R.N., Nurse (part-time)
 Joan Barrett, Secretary
 Carol Braden, Medical Office Assistant

First Aid

First aid attendants are on call as follows:

Burnaby North Campus

Monday-Friday (Attendant located in Building #22)
 0700-2200 Emergency: Local 8820
 Non Emergency: Local 8872

Saturday (Attendant located in Building #20)
 0830-1230 Emergency/non emergency: Local 8845

Burnaby South Campus

Monday-Friday Local 8608 or 5609
 0830-1630

Note: After 1630 Monday-Friday and on Saturday, call north campus attendant as above.

When first aid attendants are on duty:

(a) If injury or health problem is life threatening or if patient is otherwise immobile:

- (i) Call attendant as above giving precise location of patient;
- (ii) Call ambulance at 872-5151 advising them to enter the campus via Willingdon/Goard Way;
- (iii) Call security — pager #735-5201, wait for beep tone, give location of patient and request security to meet ambulance at Willingdon/Goard Way entrance and escort ambulance crew to patient.

(b) If patient is mobile, escort to first aid attendants at above locations.

When first aid attendants are not on duty:

(a) if injury or health problem is life threatening or if patient otherwise requires medical treatment:

- (i) call ambulance at 872-5151.

Sea Island Campus

Monday-Friday, 0800-1600

Housing

The BCIT Housing Office can help you find housing and urges you to begin your search as soon as you have been officially accepted.

Maquinna Residence

If you are registered in a full-time program of four months duration or more, you are eligible to live at Maquinna Residence.

The residence is situated on campus, minutes away from the Student Centre with its recreational facilities, food and medical services, and classroom labs. It consists of apartment blocks where 12 people can live together sharing a kitchen and cooking facilities, living/dining rooms, washrooms and laundry; bedrooms are private. The apartments are arranged for all male, all female or co-ed occupation. Each residence has a resident advisor who is there to help you with counsel and advice, in case of emergency, and to facilitate social events.

Cost

\$265.00 monthly (this does not include meals).

How to Apply

When you are advised of your academic acceptance by BCIT, you will also receive complete information and an application form for Maquinna Residence. Contact the Housing Office as soon as possible — accommodation is limited.

Redford House

If you like the idea of living in a self contained high rise bachelor apartment, then Redford House is for you. It offers single or double, furnished rooms, each with its own bathroom. You may prepare light meals in your room — kettles, toaster ovens, toasters are allowed.

Short-term or long-term students are eligible to live at Redford House.

The Culinaire Dining room at Redford House provides breakfast and lunch at reasonable prices and specially priced evening meals for student residents.

Advisors are assigned to each floor to assist and advise students.

Redford House is located next to Brentwood Mall, on several direct bus routes to BCIT and Vancouver, within 3 km of the campus.

Cost

\$9.00 per night (linen and weekly housekeeping are provided).

How to Apply

You may reserve a room by calling Redford House at (604)294-6873, in advance. An application form will be included in your academic acceptance package from BCIT.

Off-Campus Housing

Many BCIT students prefer to live in private accommodation, off-campus.

The Housing Office maintains a register of suitable local accommodation. Costs vary according to the type of housing you



choose. In 1986, average monthly costs were as follows:

- Room and board: \$350
- Sleeping room: \$150
- Room with cooking facilities: \$200-250
- Suites (basement, or...): \$275-300
- Shared accommodation (usually rented house): \$200-275

Food Services on Campus

The Food Training Centre

In the Food Training Centre, food operations are mainly performed by students in training. Service is available from 0700 in the Snack Bar with breakfast served until 1030 and lunch from 1030 to 1330. The cafeteria opens at 0900 and serves lunch from 1130 to 1330.

The Bakery

Students operate a bakery counter at the entrance to the FTC where pies, cookies, bread and a wide variety of pastries are offered for sale at reasonable prices. When training allows, special cake orders are taken; ask the cashier. The bakery is open from 0900 to 1430, Monday through Friday.

The Butcher Shop

The butcher shop, another popular shopping place on campus, is located in the FTC. Student butchers cut a wide variety of meats and operate a deli counter. Freezer orders may be placed as well. The butcher shop is open from 0900 to 1400, Monday through Friday.

The Campus Cafe

The Campus Cafe, Breezeway of Building 2N, is open *Monday through Thursday* from 0700 to 1000 for breakfast cooked to order. Lunch is served from 1100 to 1330 and dinner from 1600 to 1930. At both lunch and dinner there's a choice of hamburgers made to order; pasta bar with choice of sauces and pastas; fresh fruit health bar; salad bar and the never-empty soup corner. The deli-bar offers sandwiches made to your order with seven kinds of bread, croissants and pita bread. In fine weather, the patio area has tables for eating outdoors. In the Campus Cafe there is a large non-smoking area and the surroundings are made pleasant by dozens of hanging plants. On **Friday** there is no evening service and **closing time is 1530**. On **Saturdays** the Campus Cafe opens for breakfast from **0800 to 1000** and for lunch from **1100 to 1330**; coffee and snacks are available from opening to closing. The Campus Cafe is operated by Campus Food Services, BCIT. Questions may be addressed to the manager, Tony Spotzl, at local 8819.

Night School Service

Mobile coffee service is available in buildings 1A and 2N, Monday through Thursday from 1915 to 2015, for the convenience of those attending night classes. The Campus Cafe remains open until 21:00 Monday through Thursday.

Redford House

At Redford House cooking students and instructors operate the Culinaire Dining Room. This is an attractively appointed dining room featuring gourmet food, full table service and full bar service with an extensive wine list. Redford House is located at 1850 Rosser Avenue, one block west of Brentwood Mall. Breakfast, lunch and dinner are served Monday through Friday. Please call 298-8260 for reservations and information.



Catering Service

Campus Food Services offers catering service for meetings, dinners and campus functions. Call local 8819 for information.

Growlies

The Student Association operates "Growlies" at the SAC serving a variety of salads, sandwiches and hot foods. Vending machines are located at several points around campus. These services are available from September to the end of June. The summer schedule is not confirmed at time of printing.

Transit

The BCIT campus has frequent daily bus service providing direct access to the campus. In addition, the Sky Train rapid transit service is a short bus ride from the campus and Redford House. The cost of monthly transit passes varies according to zones travelled; passes are available from "This'n That" stores on-campus.

For information about bus routes, fares and schedules within the Greater Vancouver transit system, call the Metro Transit Information line at 324-3211. You can also pick up bus schedules for Greater Vancouver in the Maquinna Residence and Redford House.

Parking

All vehicles parking on campus, day or night, must display a valid Institute parking permit. Paid parking is in effect 24 hours a day, year round. Parking and traffic is administered and controlled by the Safety and Security Department, Building 2T, phone 432-8719. Parking Office hours are 0700-1600, Monday to Friday. Improperly parked vehicles or vehicles not displaying valid permits are subject to impoundment off campus at the owner's risk and expense. License numbers of impounded vehicles are posted at the entrance to the parking office, Building 2T, together with the name and location of the towing company. Persons parking on campus are encouraged to read the Parking and Traffic Regulations available at the parking office. Vehicles should be kept locked at all times. BCIT does not accept liability for theft from, or damage to, vehicles parked on campus.

Parking permits can be purchased at the parking office 0700-1600, Monday-Friday, year round. Sales of parking permits at other times will be announced in the campus media.

Handicapped Parking

Special parking arrangements are available by contacting the parking office.

Parking Violations

To avoid vehicle impoundment, please note the following: ensure that a valid permit is displayed at all times while parked on campus day or night; park only in areas authorized by permits; do not park in fire lanes, blocking fire hydrants, along yellow curbs, on roadways or anywhere not designated for parking or that impedes free traffic flow/pedestrian safety; do not block off another parked vehicle; do not use parking permits fraudulently.

Vehicle Assistance

Vehicle breakdowns or other problems should be referred to security staff who will assist if possible.

Canada Placement Centre

The Canada Employment Centre is located in the 1A building, 2nd floor. For employment enquiries, the office is open between 0830-1630, Monday through Friday, throughout the year; For training enquiries for students already enrolled in courses at BCIT the office is open 0930-1230, Monday through Friday, throughout the year.

The Centre provides a job placement service to diploma and certificate program graduates as well as summer and part-time job listings for undergraduates. Alumni may use the centre for up to two years after graduation.

To assist new diploma graduates, the Centre provides an on-campus recruiting program for employers to interview students for career positions, prior to graduation.

As well as job placement, the Centre provides: labor market information, company information, job search techniques, assistance with resumes and interview preparation.

For students who require a tutor, a registry of peer tutors is maintained. Telephone: 432-8333 for more information.

Staff

Michael McGarrity, Branch Manager



Bookstore

The BCIT bookstore is located at the south end of the campus on the ground floor in the south east corner of the Building 2D. It sells required textbooks and educational material for BCIT courses. Textbook lists may be consulted in the bookstore. In addition to textbooks, an extensive selection of school, drafting, engineering and computer supplies as well as paperbacks, bestsellers, magazines and sportswear are available. Personal computers may be purchased at special educational prices by full-time students. Special orders for books may be placed. The bookstore is open from 0800-1600 hours throughout the year, Monday to Friday. Extended hours of operation are offered at the beginning of each term. A schedule of dates and extended hours is posted in the bookstore prior to the commencement of each term.

Textbooks and educational material for courses at the Downtown Education Centre are available at the bookstore outlet at that location. Telephone 687-4678 for hours of operation.

Used Textbooks

The BCIT bookstore schedules used book buy backs each term. Textbooks required for that term are purchased from students for up to 50% of the current new book prices. Buy back dates are posted around the Institute a few weeks prior to the event.

Recreation and Athletic Services

BCIT offers a variety of indoor and outdoor recreational facilities designed to appeal to most students. These include four racquetball/handball courts which now accommodate the new sport, wallyball, and two squash courts; an excellent gymnasium accommodating eight badminton, two basketball and three volleyball courts, which is also used for many other sports and recreational activities. Our activity room is equipped with a universal gym, free weights, exercise area, table tennis, ballet barre and much more. Four tennis courts, two sports fields, a fitness trail and exercise stations, as well as a 396 metre track offer excellent outdoor recreation. Complete shower facilities, change and locker rooms for both men and women are included.

Hours of Operation

September-May: Monday-Thursday 0645-2300; Friday 0645-2100; Saturday 0900-1900 and Sunday 0900-2100; June-August: to be announced.

Facility hours are subject to change, check the weekly schedule posted outside the Recreation and Athletic Equipment office.

Facilities and Services — How to Use Them — All students, staff and alumni are encouraged to use the recreation facilities. Lockers, towel and laundry services are available to rent. Most equipment is provided on loan; current BCIT identification is mandatory. There is a nominal rental fee for balls, birds and racquets. There are many structured programs to participate in as well as plenty of recreation time when the gym is available for your own activity. Check the facility schedule for open and programmed time.

Guests — Students and staff may bring one guest into the facility at any time. Guests cannot sign out equipment and are asked to follow the facility regulations.

How trades or Technologies can book the Gym — Gym time is available three to five specified periods each week; BCIT

groups can book half the gym. This program is known as challenge bookings and is set up so groups can get together and enjoy a recreation activity of their choice.

How to Book Badminton and Table Tennis Facilities — Bookings are made on a first-come, first served basis with no charge for court time. You must check in and book the court at the equipment office. (No pre-booking allowed, 45 minutes court time limit).

How to Book Tennis Courts — Tennis courts can be booked for a small fee or you may play on a first-come, first-served basis, with no charge for court time. You must check in and pay prior to playing if you have booked a court.

How to Book Squash and Racquetball Courts — How often can I book? Seven full days advance booking per person, Monday through Sunday. Initial and last name must be given for all bookings. Student and staff bookings may be made by calling 432-8612 or in person. A current BCIT library card or BCIT picture ID card must be shown when you pay. Alumni may book in person or by telephone. General public may book courts in person or by telephone.

Payment of Court Fees — All fees must be paid prior to court use. Current BCIT ID must be presented in order to get the student rate. Players are required to check in at the Equipment Office prior to using the courts. A 10 minute grace period is provided for players to claim their courts. If left unclaimed, they may be resold to someone else, unless prepaid. Players must vacate their courts at the end of the specified booking period whether the game has ended or not. Failure to observe court courtesy rules will result in loss of playing privileges. Recreation and Athletic Services reserves the right to book court times for private lessons.



Facility Regulations — The Recreation and Athletic Services staff are responsible for the facility. **Smoking is not allowed in any part of the recreation facility.** Alcoholic beverages, including beer and wine, will not be allowed in the recreation facility unless approved by the Institute's chief executive officer and the appropriate permits obtained. Proper attire and accessories, shorts and shirts or sweat suits are highly recommended and clean, non-marking gym shoes (white soles preferred). Safety eye protection is highly recommended while playing squash or racquetball.

Recreation and Athletic Services — Is here to assist you in planning your leisure time. Fitness activities and leagues are scheduled around your academic programs. If you have a special interest that does not appear in this section drop in or call the Recreation and Athletic Services office located in the lobby of the SAC building, telephone 432-8613.

Intramurals — Leagues for volleyball, indoor soccer, soccer, ice hockey, wallyball, flag football, basketball, squash, racquetball, etc. are organized for school breaks, evenings and early mornings. Watch notice boards and **The Link** for costs and team information.

Clubs — We organize activities such as trips or tournaments for weekends or midterm breaks. Some funding is available to assist in transportation and equipment rentals. Activities pursued by existing clubs include skiing, outdoor recreation, scuba, sky-diving, archery and windsurfing.

Non-credit Courses — Beginner courses in kung-fu, squash, racquetball, jazz dance, golf, aerobic fitness, etc., are on-going during the school year and are subsidized by the student activity fee.

One-day Workshops — Are scheduled on weekends. They include self-defence for women, massage, stress management and various sports.

Kilometre Club — The Kilometre Club is sponsored by the Recreation and Athletic Services Department to encourage students, staff and alumni to keep active and participate in cycling, swimming or running. To become a club member, register at the Recreation and Athletic Services Office, Monday to Friday from 1000-1400. Registration Fee: \$4.00 per person/per activity. To be entitled to a T-shirt you must: Cycle 600 km in 4 months, or Swim 30 km in 4 months or run 150 km in 4 months or a run/swim/cycle combination. On completion of the appropriate activity, a T-shirt will be awarded in recognition of your dedication to achieving your goal.

Special Events — Throughout the year, we schedule special events for students and staff to promote fitness and social activities (Turkey Shoot, Challenge games, etc.), also recreational, low skill requirement, invitational and competitive tournaments with students and staff from UBC, SFU, Douglas College, etc. BCIT students are entitled to participate in any program. If you have any other interests that might attract students/staff, drop in or call the Recreation Programmer 432-8282.

Swimming Pool Tickets — The Recreation and Athletic Services Department makes available pool tickets for the following pools:

Canada Games Pool (New Westminister) 10 tickets/\$16.00
C.G. Brown Pool (Burnaby) 10 tickets/\$12.00

Alumni — Your Willingdon Club membership entitles you to participate individually or as a team in intramural leagues and other events. Contact the Recreation and Athletic office for information on leagues and schedules.



Additional Information — A brochure on dates, times and rules for intramural activities is available from the Recreation and Athletic Services and Equipment office in the SAC. (September and January)

Intercollegiate Athletics — BCIT, in conjunction with funding assistance from the Student Association, will continue to embark on the gradual re-introduction of an intercollegiate athletic program for the 87/88 academic year.

— Badminton	Men and Women
— Rugby	Men
— Volleyball	Men and Women
— Soccer	Men and Women
— Basketball	Men and Women
— Hockey	Men

We encourage any student wishing to try out for teams to watch for Cougar posters and to inquire at the program equipment office for practice times and locations.

Recreation and Athletic Services (Program Office) 432-8613/432-8282

Equipment Office and Attendants (Racquet Court Bookings) 432-8612

Student Association

The Student Association is the independent "student union" at BCIT with an annual cash flow approaching \$3 million. It provides most of the non-academic services and nearly all of the recreation and entertainment on the campus.

All BCIT students, whether full-time or part-time, automatically become members of the SA upon registration. The student activity fee, which is paid as a small addition to BCIT course fees, goes directly to the SA to help pay for the recreational and social activities provided on campus.

Another portion of the fee goes to pay for the SA's new Campus Centre, a multi-million dollar recreational and social complex organized and financed by the SA. The Campus Centre is the first independently financed student building constructed in western Canada in twenty years. Phase one, containing squash and racquetball courts, is now complete. Fund raising is under way for the new Campus Centre.

Student government began in 1966, two years after the Institute opened its doors. In October 1968, the Student Association was registered in Victoria as a Society under the Societies Act. The Student Activity Centre was built in July 1971 and the first TNT was opened. The SA pub, known as "Taps", is fully licenced and first opened its doors in 1976. In 1978 the SA opened its own food service, Growlies. In 1983 a racquetball centre was built, expanding the SAC building. In 1984 a satellite dish and screen with M.T.V. was installed in the pub. The BCIT and PVI student unions amalgamated in 1985.

New ventures of the Student Association include Duke's Cookie and Coffee bar (in the SAC), featuring freshly baked cookies of all descriptions and a gourmet selection of coffees — espresso, cappuccino, and exotic teas; a retail computer store in the library, which sells microcomputers at student prices. In addition, the Student Association now operates all vending copier machines on campus. In addition to the machines in the library, a copy centre has been established in the North Foyer of the 1A Building. Copies can also be obtained in the SAC. The SAC Information Booth sells lottery tickets, including Lotto 649, with all earnings applied to student bursaries, and tickets for various student activities.

BCIT's Student Association deserves its reputation as "the best organized student union in western Canada".

There are four "This and That" stores on campus; Store #1, on the ground level of the 2N Building, features school supplies, calculators, clothing, photo finishing, special class needs including tapes, floppy discs, technology jackets and drafting supplies; bus passes, newspapers, munchies, gift items and a whole lot more. Store #2, located in the north foyer of the 1A Building, has nearly everything listed above plus coffee, ice cream, and popcorn. Store #3, located in the SAC, specializes in clothing and sporting goods and, for your every day needs, cigarettes, pop, munchies, newspapers and school supplies. #4 store, located in the north campus Inglis Building, features the same items as above.

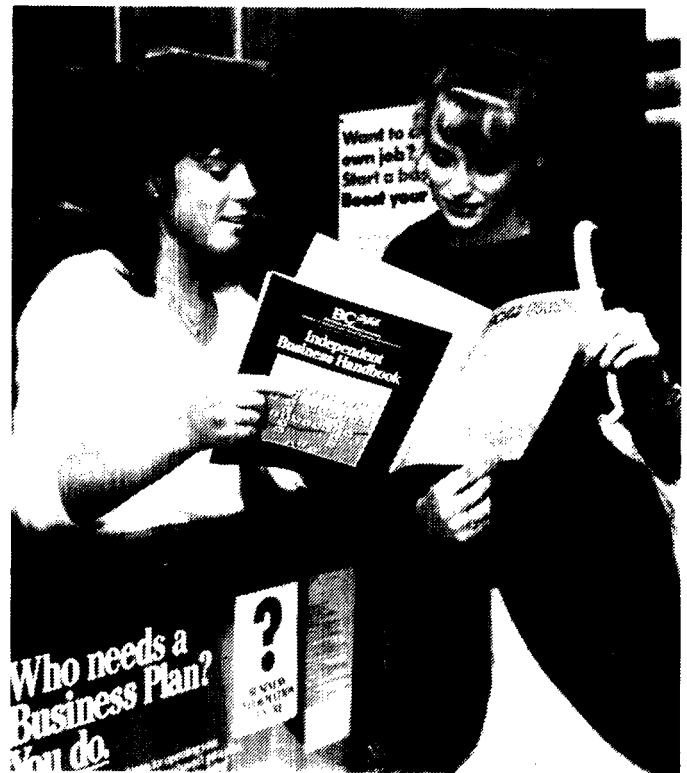
In the SAC and in the Inglis Building there is a resume service and an employment action centre to assist students in their employment search.

The SA holds elections each March to choose eight of a ten member executive: President; VP Administration and Finance; VP Public Relations; VP Student Affairs; Sport Chairperson; Engineering Society Chairperson; Business Society Chairperson; Health Society Chairperson. In addition two students from the Vocational Division of BCIT are appointed to serve on the

executive. The executive is responsible for the day-to-day management of the Association's affairs and the spending of its budget. The executive meets regularly with the Student Council consisting of representatives from all the technologies on campus.

The Executive and Council, in addition to managing the SA's internal affairs, are charged with representing BCIT students to all levels of institutional, municipal and provincial government. In recent years, this work has included lobbying against tuition fee increases, coordination of the Campus Centre and work with the BCIT administration for efficient and useful student services.

Most of the management of the SA's business operation is entrusted to a full-time professional staff of approximately 35 under the direction of Business Manager, Phil Henderson and his Assistant, Lorne Hildebrand. The managers for the various operations are: Linda Field — TNT Stores; Don Wright — Link; Janice Eden — Office; Patti Kluckner — Accounting; Darren Suveges — Media Services; Betty McCallum — Resume and Typing Service.



Activities

The SA funds the Intramural athletics and clubs program, which provides lunch hour and after class recreation for several hundred BCIT students. Extramurals have returned to BCIT this year. For skiers, the SA has access to a 24 bed chalet at Whistler Mountain, which is available year round to students at a reasonable nightly rent.

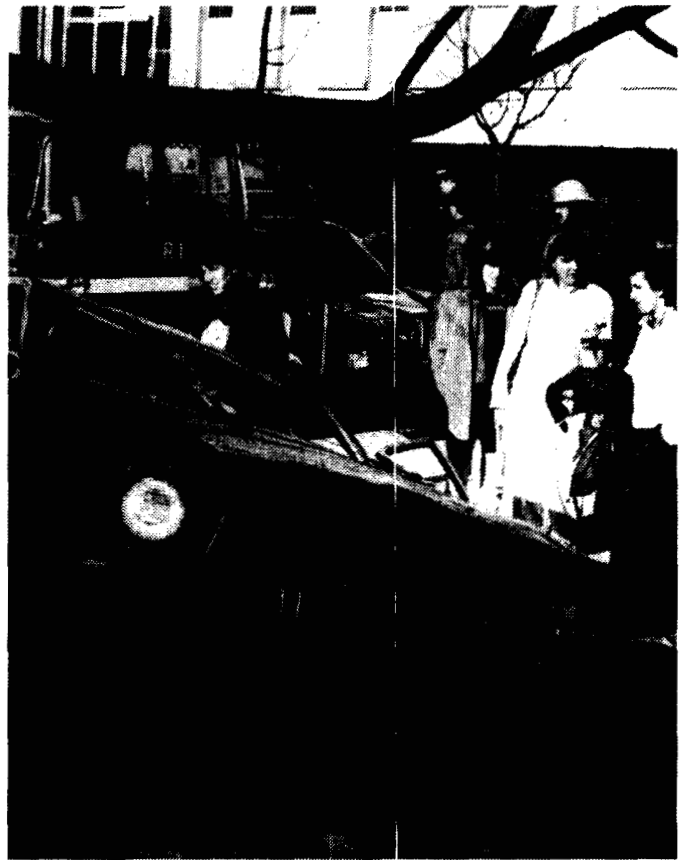
The student newspaper, "Link", is published every Wednesday during the 9 month school year and monthly during the summer.

For the past dozen years, the SA has been a major supporter of the Shinerama Cystic Fibrosis fundraising campaign held

each September, during which students shine shoes for donations around the Lower Mainland. Students are also organized to help with the Variety Club Telethon each February. Over a quarter of a million dollars have been donated to charities in Vancouver by BCIT students.



Shinerama.



Safe driving day.

Lost and Found

Please refer enquiries to Safety and Security at 432-8356. The Lost and Found is located in Building 1A, Room 130. Hours are 0800-0900 and 1200-1300, Monday to Friday.

Lockers

Lockers at BCIT are available to students on a first-come basis, except in technologies with special requirements such as Forest Resources, Surveying and Building. Students should locate an unreserved locker near their technology and put their lock on it. Lockers are situated throughout the Institute on each floor of most buildings. Lockers must be vacated at the end of each academic year, or no later than May 31. The Institute will not accept responsibility for loss or damage to a student's personal property.

Banking

Banking services on campus are available through the Canadian Imperial Bank of Commerce situated about mid-campus in the 1A building, north end. The branch is well acquainted with Canada Student Loans, so you may choose to negotiate your loan on campus. Out of town students should bring enough money to buy books, pay fees and the first month's rent. This can be in the form of a bank draft, travellers cheques, or inter-branch banking can be arranged before students leave their home towns. For your convenience, at the same location, there is an Instant Teller Machine available with Interac Network.





Alumni Association

President: John Leech (Survey '70 and '71)
Vice President: Melanie Wheating (Administrative Management '84)
Secretary: Nicki Magnolo (Travel and Tourism '81)
Treasurer: Fred Gaier (Financial Management '83)

The BCIT Alumni Association provides a vital communication link between graduates and the Institute. Graduates receive the Alumni News, published quarterly by the Association and the Association acts as the official record keeper for BCIT grads, organizes reunions and offers a group insurance plan.

The Association has extended membership to include Trades/Vocational graduates who have completed programs of at least 6 months duration, holders of Continuing Education Certificates as well as graduates of two year Diploma of Technology programs. Membership requires registration and is free of charge.

The Willingdon Club is available to all BCIT graduates. A three year membership costs \$30.00 and entitles you to a variety of benefits including: library borrowing privileges, access to student accommodation across Canada, special rates on Alumni travel programs, student rates for racquetball and squash courts on campus, and discounts on all merchandise sold by the Alumni Association. Club members can continue to use many student services after graduation that are not available to the general public. Graduates, or about to graduate students, may purchase membership at any This 'N That Emporium or at the Alumni Office.

Other priorities for the Alumni Association include development of Alumni Branch offices, involvement in the Alumni Fund Raising Campaign, increasing Willingdon Club membership and services and establishing an alumni network.

The Alumni Office is located in Trailer 1B. The direct line phone number is 432-8847.

Alumni Executive Director: Nicki Magnolo (Travel and Tourism '81)

BCIT ALUMNI ASSOCIATION REGISTRATION FORM

NAME:

PHONE: Home

ADDRESS:

Work

.....

POSTAL CODE:

PROGRAM:

GRAD MONTH/YEAR:

Please return to:

BCIT ALUMNI ASSOCIATION — 3700 Willingdon Avenue, Burnaby, B.C. V5G 3H2

Trades Training

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Trades

BCIT is the largest vocational trades training centre in British Columbia. Our programs are designed to prepare students to enter employment, and to provide them with employment upgrading and retraining opportunities. The Institute provides extensive training options in Construction Industry Trades, Metal and Steel Trades, Piping and Electrical Trades, Drafting, Mechanics, Horticulture, and Food and Hospitality.

Office of the Registrar

Mario Mazziotti, Dipl.T., Registrar
Mike Powley, B.Ed., M.B.A., Assistant Registrar Acting
Angela Evans, Systems Assistant

Registration

Kelly Durkin, Supervisor, Registration
General enquiries: 434-1610

Admissions

Brenda Walton, Supervisor, Admissions
General enquiries: Trades 432-8229
Technology 432-8419

Student Records

Jeri Fostvelt, Supervisor, Student Records
General enquiries: Trades 432-8228
Technology 432-8478

Timetabling

George Brown, Supervisor, Timetabling
General enquiries: 434-5734 (5386)

Admissions

Applicant priority is given first to British Columbia residents who are Canadian Citizens and landed immigrants who have lived in British Columbia for the immediate twelve months prior to enrolment; second priority is given to out-of-province Canadian citizens and landed immigrants, third priority is given to out-of-country applicants. BCIT does not accept applications from persons on visitors visas.

All applicants must provide official documentary proof that they meet the necessary program prerequisites. Official transcripts are required; photocopies are not acceptable. Please note, where necessary, students applying to BCIT are requested to submit all documentation with English translations in order to reduce the period required for evaluation.

Upon acceptance to a program students will be asked to pay a non-refundable/non-transferable deposit; the remaining fees are due the first day of class. Students unable to pay their tuition fees should make financial arrangements prior to the start of class.

English Language Proficiency

All programs require students to have a good comprehension of the English language. Applicants whose first language is not English may be asked to provide satisfactory test results from the Vancouver Community College English Language Assessment Test.

Transfer from Regional Colleges

Students may transfer from regional colleges to some of our Entry Level Trades Training programs. An application form must be completed and forwarded to the Admissions Office with official transcripts showing successful course completion. Admission dates are subject to space available in the program. Fees are applied accordingly.

Credit for Completion of Career Preparation Programs in Secondary Schools

Memorandums of Understanding have been signed between the Institute and Boards of School Trustees for many school districts. Credit may be given to students who have successfully completed the secondary school portion of the training, thus avoiding duplication of learning.

Continuous Entry Programs

Programs are offered throughout the year with varying start dates for each program. Students should contact the Program Advisors at 432-8433 for program information and next available start dates.

Entry Level Trades Training

Entry Level Trades Training (ELTT), BCIT's delivery of Provincial Training Access, is designed to give students the skills and practical knowledge required to get a job in one of the trade specialities listed below. On successful completion of the program, you will receive a certification and a detailed transcript documenting the skills and knowledge you have attained. In addition, you may receive credit for the first year of institutional training if you obtain apprenticeship employment.

Entrance Requirement for ELTT Programs only

Anyone over 16 who meets either of the two requirements listed below may enroll.

1. *Pass an entrance test in mathematics and reading skills.* To pass you must achieve approximately a grade 8 score. Note: Those with minor deficiencies will be admitted but will be required to complete remedial upgrading at BCIT as part of the program. Those who have major deficiencies will maintain their place on the waiting list but will be referred to another institution for upgrading before being admitted to the program.
2. *Submit documentation that you have one of the following*
 - Successful completion of Career Preparation from a BC secondary school within the past 3 years
 - Successful completion of a portion of TRAC training from another B.C. post-secondary institution within the past 3 years
 - Journeyman standing in a related trade

- Completion of one English **and** one Math course, within the past 3 years, with the stipulated mark as listed below.

Math	English
Math 10 with a B letter grade	English 10 with a B letter grade
Trades Math 11 with a B	English 11 with a C
Consumer Math 11 with a B	Composition 11 with a C
Algebra 11 with a C	Communications 11 with a C
Algebra 12 with a P	English 12 with a P
	Communications 12 with a C
	Literature 12 with a P

Some programs may require higher levels, see the appropriate specialty or call the ELTT office for additional information.

Program Description

ELTT is a competency based vocational training program. You will learn your trade in a series of small, clearly defined steps, or competencies. You will become fully proficient at each step before going on to the next one. ELTT is a practical, hands-on training system. You will be working in your shop area within the first week of entrance and the majority of your learning will be actual work in the shop. The theory you learn will be clearly related to your own trade, and you will learn it at the time that you need to apply it to practical activities.

You may begin programs the first Monday of each month, if there are spaces available. Although each specialty has a set duration (generally between 6 and 10 months) you may proceed through the program as quickly as you are able to master the skills, or you may be allowed to take up to 20% longer if you need to. Your fees will be based on the program length.

In addition to your technical skills and knowledge, you will learn and be evaluated on good work practices. Consequently, you will be expected to attend regularly and to work to industry standards.

Trade Specialties

The following trades training specialties are offered in the ELTT format:

Greenhouse and Nursery Worker	Machinist
Landscape Maintenance	Millwright
Carpentry	Ironworker
Joinery	Boilermaker
Steamfitting	Steel Fabricator
Plumbing	Sheet Metal
Electrical	Automotive Mechanic
Inboard/Outboard Mechanic	Heavy Duty Mechanic
Small Engine Mechanic	Diesel Engine Mechanic
Motorcycle Mechanic	Commercial Transport Mechanic

For further information about the ELTT program, call the ELTT Centre, 432-8312.

Apprenticeship Courses

For information on sponsorship in Apprenticeship training, you should contact the Ministry of Labor Apprenticeship Training Programs Branch at: 4946 Canada Way, Burnaby, B.C. V5G 4J6. Telephone: 660-7200.

Attendance

Regular and punctual attendance is essential for students to complete training and be granted a certificate. Students with poor attendance may not be permitted to write the final examination for the course, except in unusual circumstances such as excused absence. If students are absent for five (5) days without notifying the instructor, then it will be assumed they have withdrawn from training. For apprenticeship students, three or more days of unexcused absence will result in termination.

Students are required to contact their department when they are absent.

Certificates

A certificate of achievement will be granted to students who successfully complete approved programs.

Fees and Expenses

Tuition fees for fixed-duration training programs vary according to the length of the program. Students accepted by any program must pay a non-refundable, non-transferable deposit to confirm a space. The full tuition fee must be paid by the first day of class. Additional costs will be required to cover textbooks, personal safety equipment and tools. The additional costs vary according to the program.

Student Activity Fee

A student activity fee is charged to students at the time of registration. The fee helps to support work, services and activities organized by the Student Association.

Refunds

Students who withdraw up to 14 calendar days after the start of the classes are eligible for a full refund less the \$75 commitment fee. No refunds are given after this date.

Cancellations

The Institute will make every effort to offer all courses as listed in the calendar. Nevertheless, the Institute reserves the right to limit enrolment, to select students, to cancel courses, to combine classes or to alter time of instruction without prior notice.

Miscellaneous Fees

NSF cheques	\$15.00
Transcripts, first copy	4.00
— Additional copy	1.00
Tax receipts, duplicate	10.00
T2202A forms, duplicate	10.00
Late fee/reinstatement fee	50.00
Rereads, appeals	25.00
Student ID card duplicate	5.00
Certificate Duplicate	10.00

School of Computing and Electro-Mechanical Studies

Aviation Trades

Faculty

Foyle, William	Director
Edwards, John	Instructor
Knight, James	Instructor
Lockwood, Brian	Instructor
Mills, Peter	Chief Instructor
Muldoon, Patrick	Instructor
Murray, Vincent	Instructor
Pinz, John	Instructor
Roberts, Charles	Instructor
Sargent, John	Instructor
Upton, David	

Staff

Anderson, Patricia	Secretary
Hodgins, Greg	Storesman

Aircraft Maintenance

The Program

The program prepares students for employment in the aviation industry as aircraft mechanic learners; and eventually as mechanics or Aircraft Maintenance Engineers (AME).

The program is broad, covering all aspects of maintenance, inspection and repair of engines and airframes. The intention is to learn the basics that will enable a student to work on light, medium or heavy, fixed or rotary wing aircraft.

Program Content

There are six terms of approximately 40 days each (total 1500 hours) with a ratio of 60% practical and 40% theory.

- Term 1 — General: introduction to mechanics of flight, structures, metallurgy, blueprint reading, tools and hardware.
- Term 2 — Powerplants: basic reciprocating engines, overhaul procedures, ignition systems, carburetors.
- Term 3 — Airframe Systems: electrical, hydraulic, pneumatic, oxygen, landing gear, air conditioning.
- Term 4 — Powerplants 2: gas turbines, propellers, powerplant systems.
- Term 5 — Airframe 2: rotary wing, sheet metal, control systems.
- Term 6 — Maintenance Procedures: inspection, repair, air regulations, servicing.

The program is approved by Transport Canada.

Prerequisite

Grade 12 graduation with Physics 11 and Algebra 12. Good color vision is required. A mechanical background is recommended.



Aircraft Structures

The program prepares students for employment in the aircraft manufacture and repair industries. It covers the manufacture, fabrication, repair and maintenance of the airframe to aviation/aerospace industry standards concentrating on sheet metal, composite materials, wood and fabrics as used in aircraft components.

Program Content

This is a six month program (750 hours), with a ratio of approximately 60% practical and 40% theory.

- Term 1 — Composite Materials: structure and repair, analysis.
- Term 2 — Shop Practices: mechanics of flight, structures, blueprint reading, aircraft hardware, tools and equipment, shop mathematics.
- Term 3 — General Repair Procedures: blueprint reading and interpretation, non-destructive testing and inspection, metallurgy, sheet metal fabrication.
- Term 4 — Manufacturing and Overhaul: aircraft corrosion control, special instruments and equipment, plastics, titanium, float and hull repairs.

Prerequisite

Secondary school graduation with Algebra 11. A drafting background is recommended.

Electrical/Electronics Trades

Rudy Nobauer, Division Manager

Appliance Repair Trade

The Program

Appliance repair training includes the service and repair of domestic electric and microwave ranges, dishwashers, washing machines, electric clothes dryers, food waste disposers, water heaters, freezers, refrigerators and air conditioners.

Program Content

Trade tools and procedures	Water Heaters
Basic electrical and mechanical theory	Solid state control of appliances
Cooking appliances	Test and measurement
Laundry appliances	Public relations
Freezers, refrigerators and room air conditioners	Portable appliance repair
Dishwashers and food waste disposers	

Length of Program

10 months (40 weeks)

Prerequisite

Grade 10. Must have a good working knowledge of the English language.

Diesel Electric Power Mechanics Trade

The Program

Training will provide students for entry-level employment in any of the diverse areas of activity related to production of electrical energy. Basic theory and related information combined with "hands-on" shop practice will provide students with a firm base upon which to build confidence and competency in future dealings with diesel-generators and their associated support equipment.

Program Content

Introduction (3 months)

Hand tools and shop practice
The lathe
Welding
Basic electricity

Electrical Generating Systems (5 months)

Prime movers
DC machines
AC circuits
Alternators and transformers
AC machines
Circuit protection, switch gear and instrumentation
Schematics and auto controls
Plant operation and maintenance procedure

Length of Program

The complete course is covered in 32 weeks or 20 weeks, if credit is received for related training or experience.



Career Potential

Employment opportunities may be found with department stores, major appliance stores and appliance servicing shops which deal with electro-mechanical processes.



Prerequisite

Grade 10 is required. Must have a good working knowledge of the English language.

Career Potential

Employment opportunities may exist with major power companies; equipment designers, assemblers, and field maintenance companies; remote northern communities and camps.

Electrical Trade

The Program

Students are prepared for entry-level employment in the electrical trade. Basic theory and related information along with hands-on shop practice will develop competence to perform basic electrical tasks. Upon successful completion of the program, students may wish to work toward journeyed status in the trade by seeking employment as an apprentice.

Program Content

Describe safe work practices	Install conductors, cables, raceways and boxes
Apply the Canadian Electrical Code	Install lighting, switches and receptacles
Use electrical hand tools	Install simple motor controls
Use electrical power tools	Construct simple three wire circuits
Identify common wiring installation materials	

Length of Program

Approximately 6 months. However, students may be allowed to proceed through as quickly as they are able to master the skills, or allowed up to 20% additional time (at additional cost) if needed to complete the program.

Prerequisite

See pages 21 and 22. In addition, Algebra 11 with C standing is required.

Electronics Trade

The Program

Electronics training will provide the graduate with the skills to construct, install, maintain, analyze and troubleshoot electronics equipment and circuits. Students will learn the use of tools and test equipment; repair, adjust and test communication systems; troubleshoot and interface microcomputer systems, and participate in more advanced analog and digital systems training.

Program Content

Level A

Fundamentals of electronics AC/DC theory
Safety in electronics
Tools for electronics
AC/DC theory circuits and network analysis
Measurement and instruments
Electro-magnetism and application

Level B

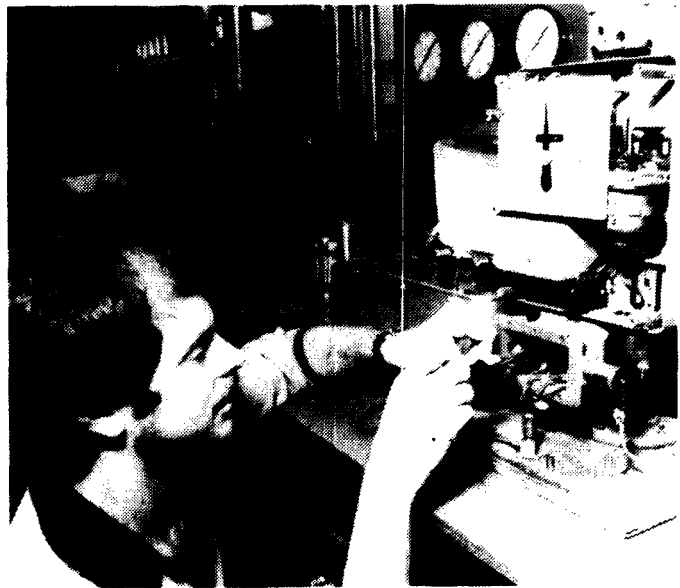
Semiconductor devices and theory	Amplification
Characteristics of semiconductors	Integrated circuits
Power supplies	Operational amplifiers
Oscillations	Communication circuits

Level C

Digital techniques and systems	Maintain microprocessors and computers
Maintain digital circuitry	Process technical information

Length of Program

39 weeks consisting of three 13-week levels, plus 5 days of testing and evaluation (40 weeks total).



Career Potential

Work may be found in residential, commercial and industrial sites with contracting firms or with any one of the resource industries.

Prerequisite

Level A — Grade 12 with Algebra 12 and Physics 11; Level B — Completion of Level A* or pass assessment for Level A; Level C — Completion of Level B* or pass assessment for Level B. Poor color vision may restrict employment in some electronic fields.

*Students with training or a combination of work experience and training may write a gating exam for advance placement.

Career Potential

This program trains graduates to undertake the installation, troubleshooting and repair of a variety of electronic equipment, including microprocessors, in the manufacturing and service departments of industrial and commercial establishments. Graduates would also be suitable to work in the electronics sales field.

Mechanical Trades

Ron Evans, Division Manager

Automotive Mechanics Trade

The Program

Training will prepare students for entry-level employment in the automotive trade. Basic theory and related information along with hands-on shop practice will enable students to become competent in basic automotive maintenance and repairs. Upon successful completion of the program, students may wish to work toward a journeyed status in the trade by seeking employment as an apprentice.

Program Content

Service wheels, hubs and tires	Service fuel delivery systems
Service brake systems	Service emission control systems
Service suspension systems	
Service steering systems	Engine analysis, troubleshooting and tune-up
Service engine components	Service transmissions
Service cooling systems	Service drives and drive shafts
Service electrical systems	

Length of Program

Approximately 7.5 months. However, students may be allowed to proceed through as quickly as they are able to master the skills, or allowed up to 20% additional time (at additional cost) if needed to complete the program.

Prerequisite

See pages 21 and 22.

Career Potential

Graduates may commence an apprenticeship or obtain employment in service and repair shops. Employment opportunities also exist with automobile accessory stores, as service and sales representatives, or graduates may choose to be self-employed.

Commercial Transport Mechanics Trade

The Program

Training will prepare students for entry-level employment as commercial transport mechanics. Basic theory and related information along with hands-on shop practice will enable students to become competent in basic mechanical maintenance of commercial transport and passenger vehicles. Upon successful completion of the program, students may wish to work toward journeyed status in the trade by seeking employment as an apprentice.

Program Content

Lift and block vehicles	Air brake systems
Operate vehicles	Air operated controls and accessories
Hydraulic systems	Batteries and electrical circuits
Steering systems operations	Perform basic oxyacetylene cutting and heating
Frames, suspensions and attachments	
Hydraulic brake systems	



Length of Program

Approximately 7 months. However, students may be allowed to proceed through as quickly as they are able to master the skills, or allowed up to 20% additional time (at additional cost) if needed to complete the program.

Prerequisite

See pages 21 and 22.

Career Potential

Employment opportunities may exist in specialty truck and bus repair shops, bus fleet yards and trucking companies.

Compressed Natural Gas/Liquid Petroleum Gas Installer (CNG/LPG) Trade

The Program

Training will prepare individuals in the motor vehicle industry to install and service CNG/LPG conversions and accessories. Theory and related information along with shop practice will develop competence to allow students to seek employment immediately in this specialized area. This program prepares you to write the required Provincial Government Certification exam.

Program Content

Safety	Installation
Basic test equipment	Refuelling
Characteristics of CNG/LPG	Tune-up
Engine and ignition requirements	Troubleshooting
CNG/LPG components	

Length of Program

CNG: 30 hours — 5 days
LPG: 18 hours — 3 days

Prerequisite

Persons seeking entry into this course must show proof of journeyman status (certificate of apprenticeship or TQ acceptable) or have successfully completed a pre-entry evaluation. A CNG certificate of completion is required for the LPG portion.

Career Potential

Successful graduates may obtain employment in service stations, automobile accessory stores and motor vehicle manufacturers, as service and sales representatives, or be self-employed. A Provincial Government License is required to install and service CNG/LPG equipment.

Computer Numerical Control (CNC) Machine Operator Trade

The Program

The purpose of the program is to train students to operate CNC machines. Training is designed for machinists and other trades wishing to upgrade their skills in the operation of CNC equipment. Students must demonstrate ability to use conventional shop equipment before being trained to operate and program CNC equipment. Training provides students with a basic background in the production of CNC programs. The learning tasks involving programming provide the operator with sufficient background to produce simple programs, and to edit existing CNC programs.

Program Content

Describe computers
Describe basic NC and CNC programming
Use CNC equipment
Process technical information

Length of Program

14 weeks

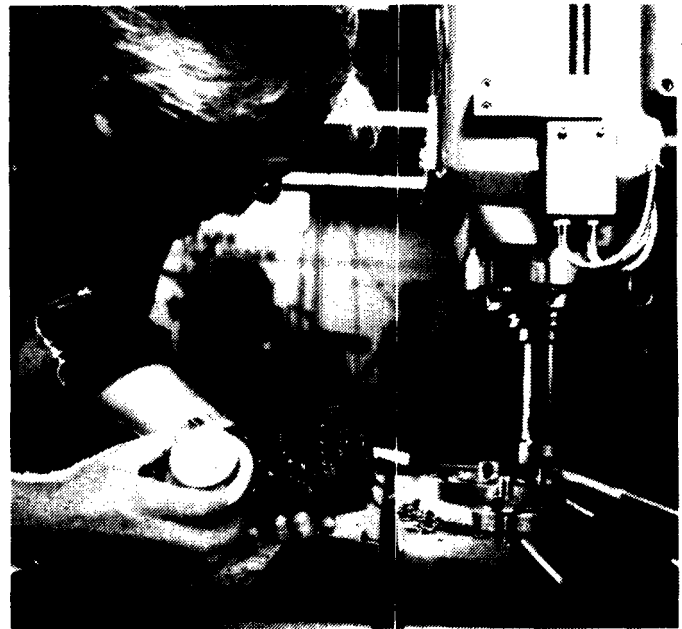
Prerequisite

Students should have completed a machinist pre-employment program, hold a trade certificate or 4th year apprenticeship or have equivalent demonstrated capability in the following areas: use of conventional shop equipment; safe work practices; mathematical problems — machine shop geometry, angles; reading and interpreting drawings and using precision measuring instruments.

Career Potential

This efficient and precise method of machine operation has a variety of applications in: machine shops, the tool and die and moldmaking fields, the aircraft industry, steel fabrication, sign making, furniture production, etc.

Any industry which requires the manufacture of individual parts or limited production runs could use this method of manufacturing.



Diesel Engine Mechanics Trade

The Program

Students are prepared for entry-level employment as diesel engine mechanics. Basic theory and related information along with hands-on shop practice will enable students to become competent in basic diesel engine maintenance and overhaul procedures. Upon successful completion of the program, students may wish to work toward journeyed status in the trade by seeking employment as an apprentice.

Program Content

Lift and block engine assembly	Service engine systems
Operate diesel engines	Service diesel fuel systems
Service cylinder block assembly	Service electrical systems
Service cylinder head assemblies	Test and store engines
	Remove and inspect engine drives

Length of Program

Approximately 10 months. However, students may be allowed to proceed through as quickly as they are able to master the skills, or allowed up to 20% additional time (at additional cost) if needed to complete the program.

Prerequisite

See pages 21 and 22.

Career Potential

Graduates of this program may find employment opportunities in the marine, logging, construction and transportation industries as well as engine overhaul shops.

Heavy Duty Mechanics Trade

The Program

Training prepares students for entry-level employment as heavy duty mechanics. Basic theory and related information along with hands-on shop practice will enable students to become competent in basic heavy duty mechanical maintenance and repair. Upon successful completion of the program, students may wish to work toward journeyed status in the trade by seeking employment as an apprentice.

Program Content

Lift and block heavy equipment in shop and field	Service track machine steering systems
Service wheel machine suspensions	Service tires
Start, move and shut down selected equipment	Service wheel machine final drives
Maintain hydraulic equipment	Service wheel machine steering and front suspension
Maintain braking systems	Service working attachments
Maintain power trains	Service gas and diesel engine support systems
Service bearings and seals	Service electrical systems and components
Service track machine undercarriages	Service winches, hoists, cables, clamps sheaves
Service track machine final drives	

Length of Program

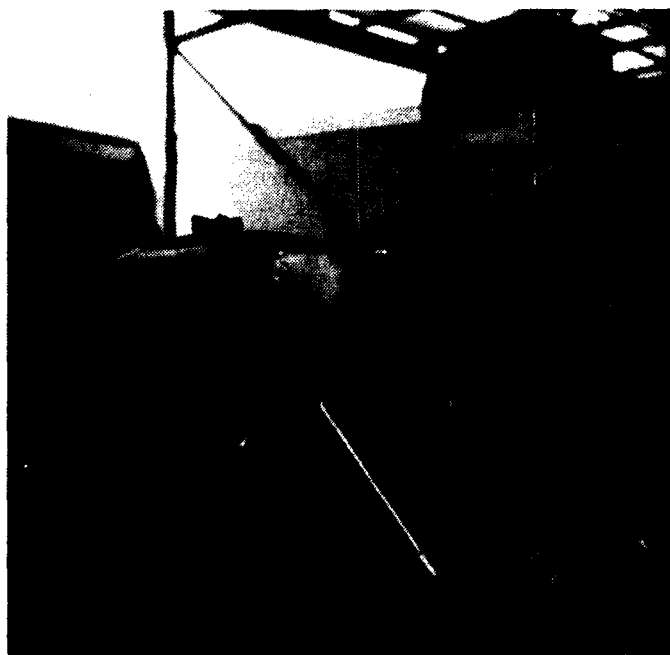
Approximately 7 months. However, students may be allowed to proceed through as quickly as they are able to master the skills, or allowed up to 20% additional time (at additional cost) if needed to complete the program.

Prerequisite

See pages 21 and 22.

Career Potential

Employment opportunities may be found with logging companies, construction companies, heavy equipment repair shops, mines, municipalities and equipment dealerships.



Inboard/Outboard Mechanics Trade

The Program

Students are prepared for entry-level employment as inboard/outboard marine mechanics. Basic theory and related information along with hands-on shop practice will enable students to become competent in basic inboard/outboard maintenance. Upon successful completion of the program, students may wish to work toward journeyed status in the trade by seeking employment as an apprentice.

Program Content

Two-cycle outboard and four-cycle outboard and inboard/outboard motors and drives covering:

- Electrical systems — Theory, starting system, charging systems, ignition systems
- Powerhead/engine overhaul — Disassembly, inspection, overhaul
- Hydraulic systems — Power train/tilt
- Cutdrive/gearcase — Disassembly, inspecting, shimming, reassembly
- Fuel systems — Theory, fuel delivery, carburetion
- Cooling systems — Outboard and inboard/outboard, raw water cooling, fresh water cooling
- Accessories — Propellers, steering remote controls
- Boat rigging for outboard motors;
- Engine timing, testing, adjusting, use of special tools, etc.

Length of Program

Approximately 8 months. However, students may be allowed to proceed through as quickly as they are able to master the skills, or allowed up to 20% additional time (at additional cost) if needed to complete the program.

Prerequisite

See pages 21 and 22.

Career Potential

Employment opportunities may exist with marinas, shops which service and repair motors, department stores and a variety of private and public operations employing their own service people and mechanics.

Machinist Trade

The Program

Training will prepare students for entry-level employment in the machinist trade. Basic theory and related information along with hands-on shop practice will enable students to become competent in the basic operations needed to make industrial parts and components. Upon successful completion of the program, students may wish to work toward journeyed status in the trade by seeking employment as an apprentice.

Program Content

Develop safe and acceptable work habits	Use shapers, planers and slot- ters
Use measuring tools	Use lathes
Solve problems using machin- ery's handbook	Use precision grinders
Apply heat treatment	Use vertical and horizontal milling machines
Use drilling machine	Describe the fundamentals of NC and CNC
Use contour bandsaw	Build a project

Length of Program

Approximately 3 months. However, students may be allowed to proceed through as quickly as they are able to master the skills, or allowed up to 20% additional time (at additional cost) if needed to complete the program.

Prerequisite

See pages 21 and 22. In addition, Algebra 11 with a C standing is required.

Millwright Trade

The Program

Training will prepare students for entry-level employment in the millwright trade. Basic theory and related information along with hands-on shop practice will enable students to become competent in basic millwright duties.

Program Content

Safety practices and proce- dures	Machine installation
Hand tools	Basic pneumatic system and components
Measuring tools	Basic fluid power systems and components
Machine components	Material handling
Millwright shop equipment	Preventive maintenance
Install power drives	
Mathematics	

Length of Program

Approximately 6 months. However, students may be allowed to proceed through as quickly as they are able to master the skills, or allowed up to 20% additional time (at additional cost) if needed to complete the program.

Prerequisite

See pages 21 and 22.

Career Potential

There is a continuing demand for skilled millwrights. Graduates may find employment in pulp and paper mills, sawmills, refineries, chemical plants, mines, shipyards, and as independent jobbers.



Career Potential

Opportunities for employment may exist in machine shops, shipyards, mills, technical laboratories, hospitals, wire rope works and the aircraft industry.



Motorcycle Mechanics Trade

The Program

Training will prepare students for entry-level employment as motorcycle mechanics. Basic theory and related information along with hands-on shop practice will enable students to become competent in working in the motorcycle service industry. Upon successful completion of the program, students may wish to work toward journeyed status in the trade by seeking employment as an apprentice.

Program Content

Shop tools	Crankshaft service
Seal, gasket and bearing design and service	Fuel delivery system service
Two- and four-cycle top end theory and design	Exhaust systems
Two- and four-cycle top end service and rebuilding	Electrical system operation, troubleshooting and service
Clutch service	Final drive systems
Lubrication systems	Brake systems
Power transmission theory and service	Wheel and tire service
	Frame and suspending systems
	Selected repairs and rebuilds

Length of Program

Approximately 8 months. However, students may be allowed to proceed through as quickly as they are able to master the skills, or allowed up to 20% additional time (at additional cost) if needed to complete the program.

Prerequisite

See pages 21 and 22.

Small Engine Mechanics Trade

The Program

Students are prepared for entry-level employment as small engine mechanics. Basic theory and related information along with hands-on shop practice will enable students to become competent in basic small engine mechanic-related tasks. Upon successful completion of the program, students may wish to work towards journeyed status in the trade by seeking employment as an apprentice or graduates may choose to be self-employed.

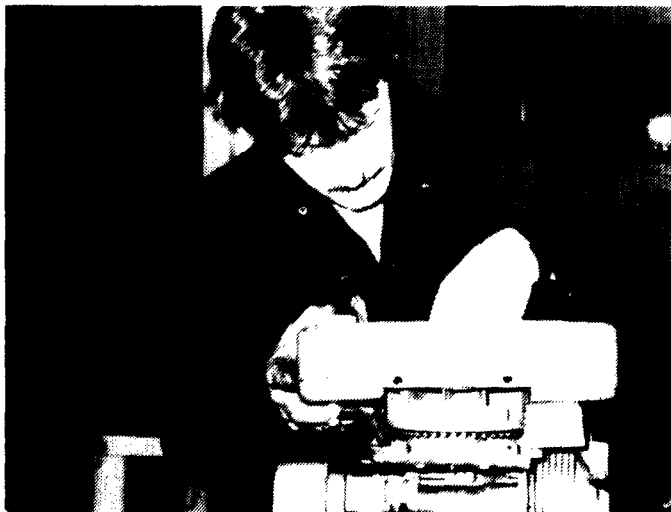
Program Content

Describe the small engines trade	Service electrical systems
Use selected shop tools	Describe lubrication systems
Perform two- and four-cycle service and rebuilding on small engines and chainsaws	Describe seal, gasket and bearing design and service
Service fuel delivery systems	Service clutches and transmissions
Service diesel fuel injection systems	Service hydraulic systems and components
Service all types of recoil starters	Describe exhaust system design and maintenance
Perform selected service procedures	Develop business procedures
	Sawfiling
	Special sharpening equipment



Career Potential

Employment opportunities include working at motorcycle dealership service departments and parts or sales positions at all levels of this expanding industry.



Length of Program

Approximately 8 months. However, students may be allowed to proceed through as quickly as they are able to master the skills, or allowed up to 20% additional time (at additional cost) if needed to complete the program.

Prerequisite

See pages 21 and 22.

Career Potential

Mechanics may find employment with department stores, construction firms, equipment rental shops, resorts, golf courses, city works yards, school boards, landscaping contractors and small engine repair shops; or graduates may choose to be self-employed.

Metal Working Trades

Ron Evans, Division Manager

Boilermaker Trade

The Program

Training will prepare students for entry-level employment as boilermakers (erectors). Basic theory and related information along with hands-on shop practice will enable students to become competent in basic vessel construction tasks. Upon successful completion of the program, students may wish to work towards journeyed status in the trade by seeking employment as an apprentice.

Program Content

Apply safe and acceptable work habits	Fabricate and erect tanks
Apply rigging	Fabricate and erect boilers
Use lifting equipment	Assemble and dismantle refinery components
Use specialized boilermaker tools	Identify non-destructive testing (NDT)
Apply oxyacetylene burning techniques	Use fibreglass reinforced plastics (RFP)
Arc weld	Basic administration
Fabricate and erect penstocks.	

Length of Program

Approximately 6 months. However, students may be allowed to proceed through as quickly as they are able to master the skills, or allowed up to 20% additional time (at additional cost) if needed to complete the program.

Prerequisite

See pages 21 and 22.

Ironworker Trade

The Program

Training will prepare students for entry-level employment in the ironworking trade. Basic theory and related information along with hands-on shop and field practice will enable students to become competent in basic ironworking activities. Upon successful completion of the program, students may wish to work toward journeyed status in the trade by seeking employment as an apprentice.

Program Content

Describe safe work practices	Use erection equipment
Select ironworker hand tools	Erect steel structure and tower
Select ironworker power tools	Select reinforcing steel
Arc weld and oxyacetylene cutting	Apply reinforcing steel
Fit structural shapes	Install curtain wall
Apply rigging including knots, hoists and splicing	

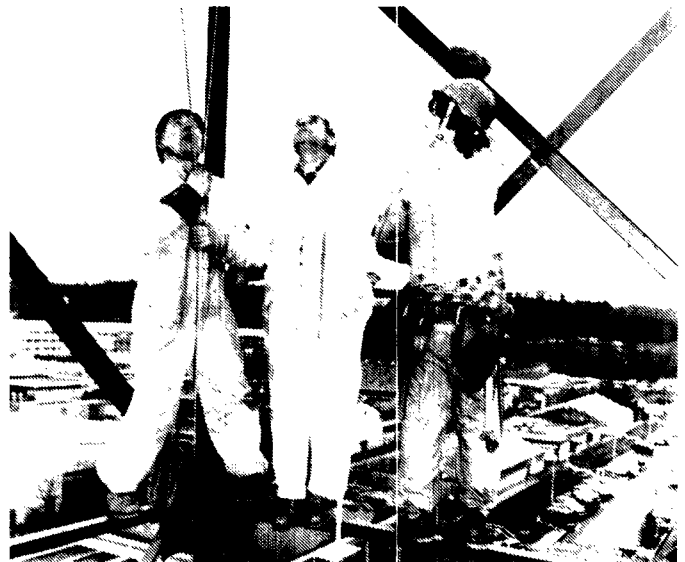
Career Potential

Opportunities for employment may exist in pulp, mining, industrial and hydro-electric installations and construction.



Career Potential

Graduates may obtain construction and maintenance work in industrial and commercial plants dealing with steel fabricating, steam manufacturing, oil refining and chemical, petro-chemical, cement, atomic, fertilizer or water treatment. Breweries, saw-mills, pulp and paper mills, hydro-electric facilities and many other industries and businesses also employ boilermakers.



Length of Program

Approximately 6 months. However, students may be allowed to proceed through as quickly as they are able to master the skills, or allowed up to 20% additional time (at additional cost) if needed to complete the program.

Prerequisite

See pages 21 and 22.

Sheet Metal Trade

The Program

Students are prepared for entry-level employment in the sheet metal industry. Basic theory and related information along with hands-on shop practice will enable students to become competent in fabricating basic sheet metal products. Upon successful completion of the program, students may wish to work towards journeyed status in the trade by seeking employment as an apprentice.

Program Content

Safety	Develop patterns using parallel line development
Select sheet metal	Develop patterns using radial line development
Mathematics	Develop patterns using triangulation
Seams and edges	Construct a blowpipe project
Riveting	Construct a stainless steel project
Soldering	Fabricate roofing projects
Sheet metal hand tools	Welding arc and gas
Sheet metal power tools	Construct a ventilation project
Sheet metal equipment	
Sheet metal hand operated machines	

Length of Program

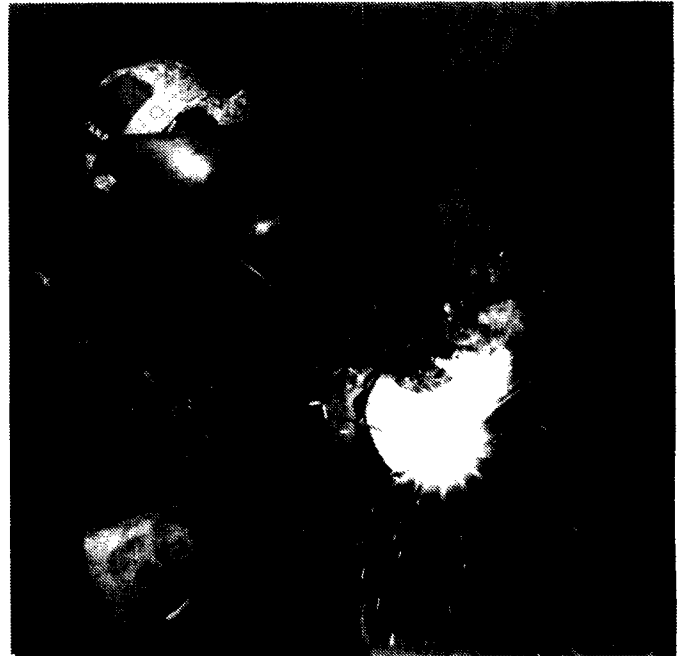
Approximately 6 months. However, students may be allowed to proceed through as quickly as they are able to master the skills, or allowed up to 20% additional time (at additional cost) if needed to complete the program.

Prerequisite

See pages 21 and 22.

Career Potential

Graduates may find employment in the construction and metal manufacturing industries and may specialize in design and layout or fabrication.



Steel Fabricator Trade

The Program

Training will prepare students for entry-level employment as steel fabricators. Basic theory and related information along with hands-on shop practice will enable students to become competent in basic steel fabrication methods for products such as steel buildings, tanks, equipment. Upon successful completion of the program, students may wish to work towards journeyed status in the trade by seeking employment as an apprentice.

Program Content

Describe safe work practices	Use steel fabrication hand tools
Read and interpret steel fabrication drawings	Use steel fabrication power tools
Make templates for shop construction	Use steel fabrication shop equipment
Fabricate projects	Use oxyacetylene burning equipment
Clean and prepare surfaces	
Use welding equipment	
Develop patterns for shop construction	

Length of Program

Approximately 6 months. However, students may be allowed to proceed through as quickly as they are able to master the skills, or allowed up to 20% additional time (at additional cost) if needed to complete the program.

Prerequisite

See pages 21 and 22.

Career Potential

Employment opportunities exist in shipyards, with bridge and building fabricators, mining and logging industries and many custom fabrication shops which may manufacture items such as: farm machinery, truck boxes, food processing equipment, heavy construction equipment, recreational equipment, pulp and paper manufacturing equipment. At a later date, the graduate may also wish to branch off into a specialized metal fabrication area such as aluminum or stainless steel fabrication.

Welding Trade

The Programs

The three welding programs, (Level C, B and A) provide the training required for Provincial welder certification.

Each of these qualification levels is followed by a job experience requirement to be completed before certification can be awarded through the Employment Training Branch of the B.C. Ministry of Labour.

Level C Program

This program is designed to develop the fundamental skills and knowledge required for initial employment in the welding industry.

P = Practical Module
RK = Related Knowledge Module

Level C Modules/Courses

P1 Safe work practices	P6 Gas metal arc welding (GMAW 1)
P2 Oxyfuel gas cutting	Flux core arc welding (FCAW 1)
P3 Gas welding and braze welding	RK1 Material handling
P4 Shielded metal arc welding 1 (SMAW 1)	RK2 Blueprint reading 1
P5 Carbon arc gouging (AAC)	RK3 Welding metallurgy 1

Level B Program

This program develops more advanced welding skills and related theory than were taught in the Level C program, i.e., pipe welding, gas tungsten arc welding process, etc., providing graduates with a broader base of skills and resulting employment opportunities.

Level B Modules/Courses

P7 Shielded metal arc welding 2 (SMAW 2)	RK4 Welding quality control and inspection procedures
P8 Gas metal arc welding 2 (GMAW 2)	RK5 Welding code standards and specifications
P9 Flux cored arc welding 2 (FCAW 2)	RK6 Blueprint reading 2
P10 Gas tungsten arc welding (GTAW 1)	RK7 Welding Metallurgy 2

Level A Program

This program develops more advanced welding skills and related theory than were taught in the Level C and B programs, i.e., pipe welding with stainless steel electrodes, more advanced blueprint reading and welding metallurgy, etc. Completion of this program along with the required work experience modules should provide the graduate with the broadest base of skills and employment opportunities in our diverse metal joining industries.

Level A Modules/Courses

P11 Shielded metal arc welding 3 (SMAW 3)	RK8 Metallurgy 3
P12 Gas Tungsten arc welding 2 (GTAW 2)	RK9 Blueprint reading 3

Upgrading Options (or C, B, A and Options)

This program of training and testing options is intended to advance welders who possess basic welding skills and who now want to achieve a higher level of competency and specialization in order to meet most of the certification requirements of industry and welding code governing agencies.



Content

Level C, B and A performance challenge tests**
Canadian Welding Bureau (CWB) procedural tests*
A.S.M.E. — M.O.L. prequalified welding procedure tests*
Company and/or manufacturers' performance tests*
Welding process upgrading
General brush-up of skills
Any individual module* from Levels C, B, or A of the B.C. registered welder training programs
* See modules/courses listed under the Level C, B and A programs.

Length of Program

Level C — Up to 7 months
Level B — Up to 4 months, depending on number of modules required
Level A — Approximately 2 months, depending on number of modules required
Upgrade options — Varies as to individual requirements and goals

Prerequisite

Level C

Completion of Grade 10 recommended but an appropriate combination of work experience and education will be considered.

Level B

Completion of the BCIT Level C program or other training equivalent to the Level C Institutional/College training component of the Provincial Registered Welder Program. (Completion of the Level C job experience is not an entrance requirement).

Level A

Completion of the BCIT Level B program or other training equivalent to the Level B Institutional/College Training component of the Provincial Registered Welder Program. (Completion of the Level B job experience is desirable but is not mandatory as an entrance requirement).

Note: Completion of the Gas Tungsten Arc Welding 1 course in Level B program or its equivalent is a prerequisite to Gas Tungsten Arc Welding 2 course.

Welding Upgrade (or C, B, A and Options)

This program is offered on a continuous intake basis "where spaces will be filled as they become available". Applicants must be welders currently or recently employed in the field of welding.

* A letter of approval for welding test may be required for company/union welding tests.

** A letter of approval is also required from M.O.L. for level C, B and A

challenge performance tests.

Career Potential

Nearly every trade employs welders. Most of our graduates find work in such diverse work places as: metal fabricating shops, general repair shops, new construction sites, mining, logging, ship building and oilfield camps.

School of Construction and Natural Resource Studies

Construction Trades

Jack Scarfe, Division Manager

Bricklaying Trade

The Program

The Bricklaying program is intended to prepare students for entry level employment in the bricklaying trade. Basic theory and related information combined with shop practice will develop competence in basic bricklaying.

Program Content

Practical use of basic masonry tools	Trade-related international (metric) measurements
Masonry units	Students will be required to build some projects within a set time to given standards
Mortar	
All phases of basic masonry construction	

Length of Program

Up to 5 months: minimum 10 weeks, maximum 20 weeks (practical work is self-paced). Program content has been organized into modules to ensure maximum flexibility for individualized training.

Prerequisite

Grade 10 recommended. Applicants must have a good working knowledge of the English language.

Carpentry Trade

The Program

Training is intended to prepare students for entry-level employment in the carpentry trade. Basic theory and related information along with hands-on shop practice will enable students to become competent in basic carpentry tasks. Upon successful completion of the program, students may wish to work toward journeyed status in the trade by seeking employment as an apprentice.

Program Content

Describe safe work practices	Build concrete forms
Use carpentry hand tools	Set frames
Use carpentry power tools	Frame a building
Lay out site and building	Identify steel framing and dry-wall systems
Calculate quantities and costs	Finish internal and external details
Introduction to cabinet construction	Identification of construction materials
Introduction to basic welding styles	Basic stair construction

Length of Program

Approximately 6.5 months. However, students may be allowed to proceed through as quickly as they are able to master the skills, or allowed up to 20% additional time (at additional cost) if needed to complete the program.

Prerequisite

See pages 21 and 22.



Career Potential

Employment opportunities exist with brick and stone manufacturers, large building construction firms, government and municipal agencies, small construction companies, the commercial and residential market and other related occupations.



Career Potential

Construction companies, plus government and municipal institutions which engage in industrial, commercial and/or residential building projects are potential employers.

Joinery Trade

The Program

Training is intended to prepare students for entry-level employment in the joinery trade. Basic theory and related information along with hands-on shop practice will enable students to become competent in basic interior woodworking tasks. Upon successful completion of the program, students may wish to work toward journeyed status in the trade by seeking employment as an apprentice.

Program Content

Select specialty materials
Use joints and fasteners
Use joinery shop equipment
Select cabinet hardware
Apply layout techniques
Machine cabinet details

Assemble cabinets
Install cabinet hardware
Prepare surfaces for finishes
Install glass
Install plastic laminate and
sheet goods
Install cabinets

Length of Program

Approximately 6.5 months. However, students may be allowed to proceed through as quickly as they are able to master the skills, or allowed up to 20% additional time (at additional cost) if needed to complete the program.

Prerequisite

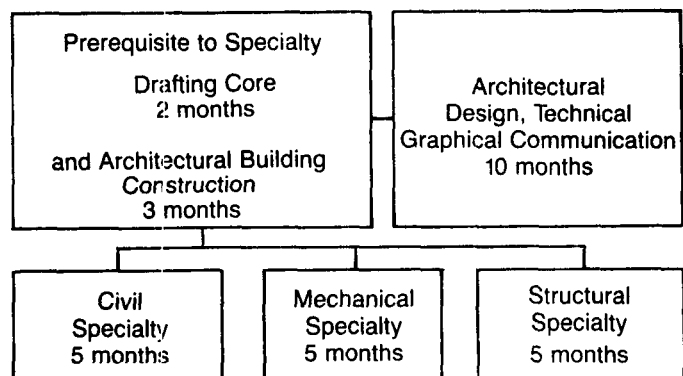
See pages 21 and 22.

Career Potential

Students may seek employment with woodwork production plants, custom millwork shops, kitchen manufacturing and custom furniture shops.



Drafting Trade



Prerequisite for Combined Program

Grade 12 with Grade 11 math. Good hand/eye coordination and technical aptitude. Students will normally enter at the core level although credit for prior experience and/or acquired knowledge may be given. Test required.

Drafting Core

Prepares the student with the basic knowledge and skills of drafting to enter any drafting specialty and includes introduction to drafting, math and surveying, and CAD training.

Length

Two months

Architectural Building Construction

Prepares the student to choose one of the four specialties available and concentrates on developing basic drafting skills. Includes introduction to architectural specialty, introduction to building systems and graphic techniques and continuation of CAD training.

Length

3 months if credit is granted for drafting core. 5 months if combined with drafting core.

Career Potential

Possible employment at the junior drafter level.

Civil Drafting

The Specialty

Prepares the student to combine the necessary understanding of building construction with the requirements of municipal regulations.

Specialty Content

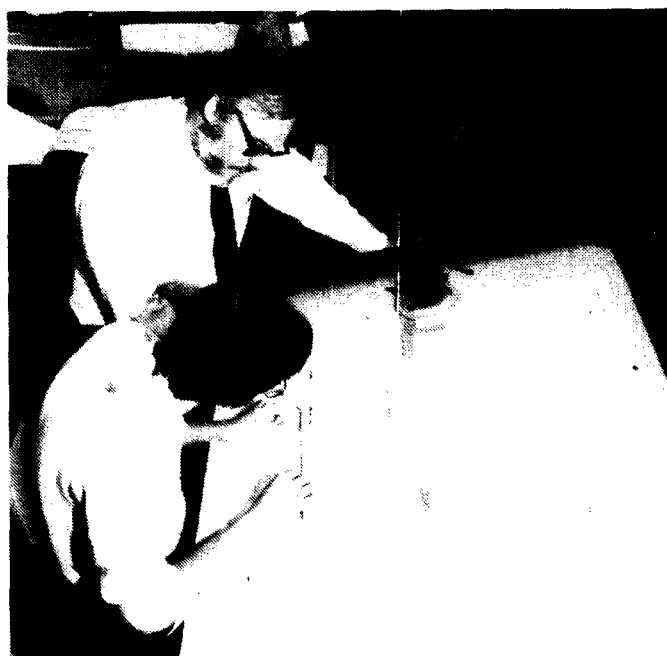
Basics of civil drafting as combined with architectural building construction and highway design, municipal services, surveying; plus a continuation of CAD training

Length of Specialty

5 months

Career Potential

Students may be potential drafters and surveying assistants working for engineering firms, surveyors, municipalities.



Mechanical Drafting

The Specialty

Prepares the student to combine the understanding of building construction with the design and regulatory devices used in detailing building mechanical systems.

Specialty Content

Combines the mechanical processes of buildings (i.e. plumbing, electrical, heating and ventilating, gas) with building construction techniques.

Length of Specialty

5 months

Career Potential

Employment may be found in architectural offices specializing in systems design.

Structural Drafting

The Specialty

This drafting specialty covers specific detailed information on structural building components and the preparation of working drawings using architectural and structural techniques, and requirements as they apply to building construction.

Specialty Content

Combines building construction with the design of reinforced concrete and structural steel.

Length of Specialty

5 months

Career Potential

Students may find employment in engineering offices with specialty concerns dealing with reinforced concrete and structural steel.

Architectural Design Technical and Graphical Communication

The Specialty

In assessing their suitability for this program, the potential applicant should consider that:

1. In general, programs of professional study are highly focused. Architecture is no exception to this, calling for a high degree of motivation;
2. Architectural studies involve ability, an understanding of people's needs, of technologies, the human ethic and fine arts. The student should, therefore, expect to draw upon a breadth of academic and personal experience;
3. Much of the program calls for judgement and decision-making ability in situations where there are no clean-cut solutions. Students find that, in addition to intellectual and creative ability, they also need initiative, tenacity and a tolerance for uncertainty.

Specialty Content

Graphic communication	Site planning
Architectural principles	Construction systems
The design process	Building elements
Behavioral design	Building types planning
Modern architectural history	Building codes and bylaws
Townscape and urban space	Directed studies projects

Length of Specialty

10 months

Prerequisite

Applicants should have:

1. Completed a study of English (Literature Eng 12 C+ and Composition);
2. Completed a study of Mathematics Algebra 12 C+ (Introductory Calculus), except that the Admissions Committee may instead require a written examination in the subject;
3. Prior training or experience in arts, crafts or design oriented activities. Ability for visual communication is extremely valuable.

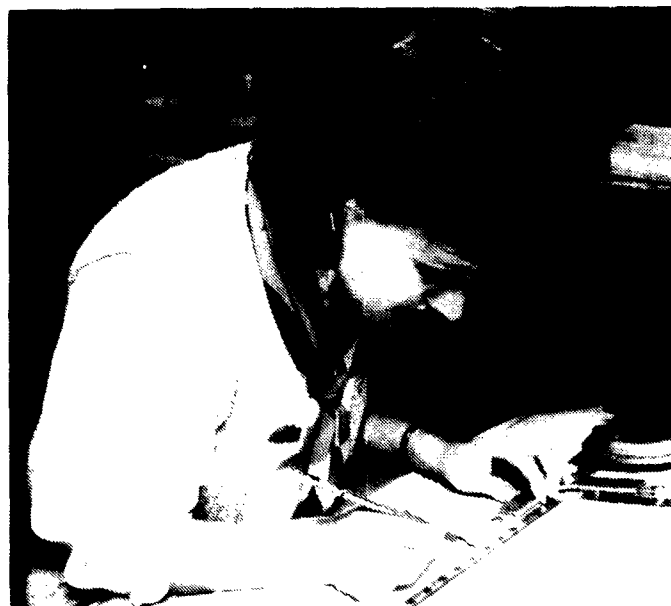
All applicants will be required to attend an interview with:

1. Evidence, such as a portfolio of materials, demonstrating the applicant's creative ability in the manipulation of three-dimensional form;
2. A short essay (approximately 550 words) detailing their reasons for choosing Architecture as a career.

Applicants will also be required to complete a test of aptitude. Mature students who lack formal education may be considered if they have clear objectives and display evidence for success.

Career Potential

Employment may be found in architectural firms or related engineering companies.



Plumbing Trade

The Program

Students are prepared for entry-level employment in the plumbing trade. Basic theory and related information along with hands-on shop practice will enable students to become competent in basic plumbing-related maintenance tasks. Upon successful completion of the program, students may wish to work toward journeyed status in the trade by seeking employment as an apprentice.

Program Content

Use safe work practices	Use oxyacetylene equipment
Describe the piping trades	Construct piping systems projects
Basic math and science	
Care and use of hand tools	Read and sketch basic drawings
Care and use of power tools	
Care and use of shop equipment	Plumbing materials
Select common piping materials	Trade math and science
Install valves, fittings, hanger supports and sleeving	Low temperature hot water heating
Rigging and scaffolds	Drafting
	Install plumbing systems
	Prepare for employment

Length of Program

Approximately 6.5 months. However, students may be allowed to proceed through as quickly as they are able to master the skills, or allowed up to 20% additional time (at additional cost) if needed to complete the program.

Prerequisite

See pages 21 and 22.

Career Potential

Employment opportunities exist in residential, commercial and industrial plumbing fields.

Steamfitting Trade

The Program

Training will prepare students for entry-level employment as steamfitters/pipefitters. Basic theory and related information along with hands-on shop practice will enable students to become competent in basic steamfitting/pipefitting tasks. Upon successful completion of the program, students may wish to work toward journeyed status in the trade by seeking employment as an apprentice.

Program Content

Use safe work practices	Use oxyacetylene equipment
Describe the piping trades	Construct piping systems projects
Basic math and science	
Care and use of hand tools	Read and sketch basic drawings
Care and use of power tools	
Care and use of shop equipment	Steam pipe materials
Select common piping materials	Trade math and science
Install valves, fittings, hanger supports and sleeving	Low temperature hot water heating
Rigging and scaffolds	Steam heating
	Manufactured fittings
	Fabricated fittings
	Prepare for employment

Length of Program

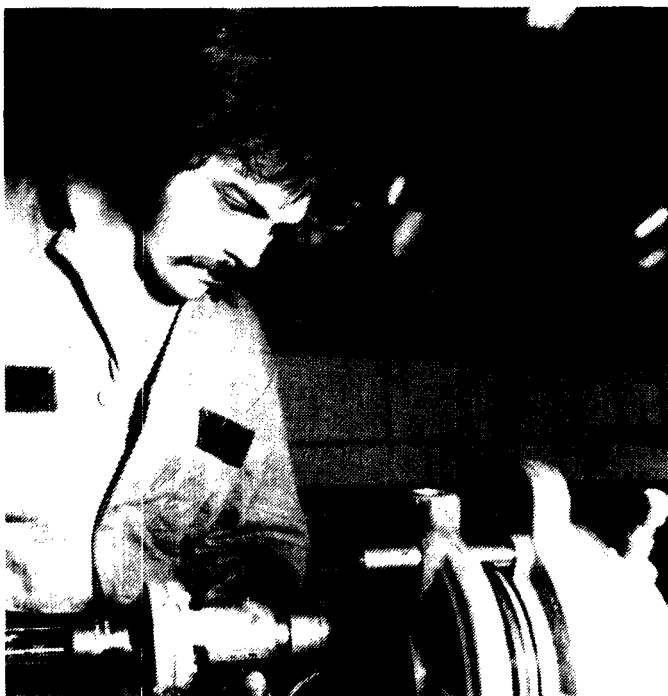
Approximately 6.5 months. However, students may be allowed to proceed through as quickly as they are able to master the skills, or allowed up to 20% additional time (at additional cost) if needed to complete the program.

Prerequisite

See pages 21 and 22.

Career Potential

Typical places of work include thermal and hydro power plants, mines, chemical and industrial plants, petroleum refineries, pulp and paper mills, dairies, schools, apartment and office buildings, hospitals, shopping malls, laundries, ships, shipyards and oil drilling platforms.



Upholstery Trades

Jack Scarfe, Division Manager

Upholstery — Auto Trimmer

The Program

This program will prepare students for entry-level employment as automotive upholsterers. Basic theory and related information along with hands-on shop practice will enable students to become competent in basic and custom automotive upholstery work.

Program Content

General shop practice	Design, layout, cutting, sewing and installation of:
Tools and equipment	— Door panels
Sewing machine operation	— Seats
Button machine operation	— Carpets
Trim and hardware	— Headliners
Materials	— Vinyl tops
Models and styles of automobiles	— Convertible tops
	— Glass

Length of Program

5 months

Prerequisite

Grade 10. Must have a good working knowledge of the English language and a genuine interest in the restoration of automobiles.



Career Potential

Employment opportunities exist with automotive body shops, upholstery shops, auto seat cover centres and industrial upholstery trimming shops which specialize in a particular area of work, such as restoring cars or custom work.

Upholstery — Custom Furniture

The Program

This program covers the theory and practical skills required by a custom furniture upholsterer. Students are taught how to use hand and power tools, layout, match materials, plus mark and cut to a particular design or style. Students learn the use of a sewing machine, cements, glues, buttons and tufting, and will also learn how to estimate jobs and good business practice.

Program Content

Level 1

Safety and handling equipment
Estimating and layout — basic
Fabric cutting and lay up — basic
Paddings, terms and usage
Foam pricing and estimating — basic
Fabricating cement and solvents
Stripping upholstery — basic

Level 2

Stripping for templates
Frame repairs and styling
Showwood refinishing
Coil and no-sag springs
Sewing cushions and skirts
Edgings and installations
Basic tufting

Level 3

Designing tufts and flutes
Installation of tufts and flutes
Application of layouts
D.N.R. — railroad cutting
Fabric variations and treatments

Level 4

Technical sewing methods
Detailed sewing — back seats
Types of sewing
Upholstery terms (five major areas)
Stitching methods
Application of pleating methods
Upholstery with vinyls

Level 5

Trimming and finishing — terms and methods
Application of finishings
Estimating
Decorating methods — fabric
Decorating methods — design
Pricing
Business practice
Sales calls

Length of Program

5 months

Prerequisite

Grade 10, or a good working knowledge of the upholstery trade.



Career Potential

Employment opportunities may be found with furniture manufacturers, department stores, furniture refinishing and recovering firms. Many graduates have started their own businesses.



Horticulture Trades

Jack Scarfe, Division Manager

Forestry Crewperson Trade

The Program

Students are taught both the theory and practical skills required by the forestry industry; emphasis is on practical field work. Students will learn forest regeneration, survival and pre-juvenile spacing; site preparation and cone collection; and will acquire the skills necessary to use the power tools, hand tools and mechanical equipment required for clearing, spacing and planting. Recognition of common insects, diseases and undesirable species, concluding with the pesticide application control program, are all part of the intensive training provided.

Program Content

Site preparation	Cone collection
Forestry division organization	Tree planting
Intensified forestry	Exposure to common insects and diseases and recognition of problem areas
Regeneration, survival and pre-juvenile spacing surveys	Mechanical juvenile spacing
Traversing	Undesirable species control techniques
Power chain saw safety and maintenance	Survival first aid course
Maintenance of personal physical condition	Pesticide application course
	Pesticide application course

Length of Program

5 months

Prerequisite

Grade 10. Excellent physical condition is essential. Must have a good working knowledge of the English language.

Greenhouse and Nursery Worker Trade

The Program

Training will prepare students for entry-level employment as greenhouse and nursery workers. Basic theory and related information along with hands-on shop practice will enable students to develop competence in performing basic greenhouse and nursery work.

Program Content

Identify plants	Grow field stock
Identify plant parts and processes	Grow container stock
Identify soils and fertility levels	Grow greenhouse crops
Propagate plants	Identify pests, diseases and weeds
Select nursery site	Obtain Pesticide Applicators License
Select structures for growing	Grade and pack nursery stock
Operate environmental control systems	Develop business awareness
Select specialized equipment	
Schedule crops	

Length of Program

Approximately 8 months. However, students may be allowed to proceed through as quickly as they are able to master the skills, or allowed up to 20% additional time (at additional cost) if needed to complete the program.

Prerequisite

See pages 21 and 22.



Career Potential

Forestry crewperson training provides you with the opportunity to work outdoors for others or of becoming a contractor yourself. Opportunities exist for employment with federal and provincial governments, large forest companies, industrial research companies and many private companies.



Career Potential

Successful graduates may find employment with established garden centres, greenhouses or nurseries. There is also good potential for self-employment.

Landscape Maintenance Trade

The Program

Students are prepared for entry-level employment as landscape maintainers. Basic theory and related information along with hands-on shop practice will enable students to become competent in basic landscape maintenance.

Program Content

Identify plants	Maintain plants
Identify plant parts and processes	Identify pests, diseases and weeds
Identify soils and fertility levels	Obtain Pesticide Applicators License
Improve soil	Plant displays
Drain and irrigate	Estimate costs
Use specialized equipment	Schedule work
Install turf	Develop business awareness
Maintain turf	

Length of Program

Approximately 8 months. However, students may be allowed to proceed through as quickly as they are able to master the skills, or allowed up to 20% additional time (at additional cost) if needed to complete the program.

Prerequisite

See pages 21 and 22.

Career Potential

Successful graduates may find employment with established landscape maintenance firms, garden centres, nurseries, parks boards and with municipal and provincial ground crews. There is also good potential for self-employment.



Tree Trimmer Trade

The Program

This is a practical hands-on course dealing with operation, maintenance and safety of tree trimming and climbing operations.

Program Content

Chainsaw operation	Climbing
Survival first aid	Live wire operations
Chipper operation	Pruning
Ground safety	Roping, topping for limb removal
Falling and bucking	Rescue
Boom truck operation	

Length of Program

20 days

Prerequisite

Applicants should have a minimum of two months experience in tree trimming or be graduates of the Forestry Crewperson program, for safety reasons.

Career Potential

W.C.B. Survival First Aid certification. Successful completion of the program plus 1200 hours of supervised climbing and trimming near energized lines entitles trainees to write an examination for joint certification by B.C. Hydro and Western Utility Arborists Association. This certification is often required for employment with B.C. Hydro or with contractors who work for B.C. Hydro.

Special Equipment

Students should bring their personal rain gear, climbing boots and personal safety gear (hard hat, eye/ear protectors, slash pants). Students need standard lineman's boots. Chainsaws should be brought by each student.

School of Management Studies

Food and Hospitality Trades

John Bateman, Director

Commercial Baking Trade

The Program

Training covers all aspects of the baking trade, including bread, cookies and special occasion cakes. Theoretical instruction will include safety, sanitation and hygiene, weighing and measuring techniques and devices, baking terminology, food handling and elementary management. The program's emphasis is on the theory and practical knowledge of basic commercial baking preparation.

Program Content

Food handling and storage	Puff pastries
Sweet yeast production	Buns and rolls
Bread baking technology	French pastries
Pies, cakes and flans	Seasonal products
Cookies and petits fours	Plant safety factors; sanitation and hygiene
Sugar art work	Elementary management
Flowers of royal icing and marzipan	Operation of bakery machinery and use of hand tools
Analysis of materials and terms	Customer relations
Special occasion cakes, wedding cakes	

Length of Program

9 months — Intakes every 4 weeks.

Prerequisite

Grade 10 or mature student. Applicants will be required to present a recent medical certificate and proof of chest x-ray or TB test upon confirmation of a start date.

Career Potential

Employment opportunities may be found in large and small bakeries, hotels and restaurants, department stores and large food chain stores. Many graduates have successfully started their own businesses.



Professional Cook Training Trade

The Program

Cook training covers all areas of short order, institutional, a la carte and banquet cooking. Students are trained to plan menus, prepare and present foods attractively, cook in quantities, bake, and manage kitchen activities.

Program Content

Level 1: Short Order Cook/Short Order Lab — 5 Weeks

Salad; sandwich; grill; sanitation (must pass Burnaby Health Dept. Food Handlers' Certificate); safety; broiling; basic soup; basic dessert; roasting; gravies; garnish; seafood; breakfast cooking; basic vegetable; microwave use; poultry and meat identification; principles of cooking; service preparation; salad bar.

Short Order Practical — 10 Weeks

Short order practical in short order kitchen and Culinaire Dining Room.

Training in Industry — 5 Weeks

With instructor supervision.

Level 2: Institutional Cook/Cafeteria and Institutional Lab — 5 Weeks

Vegetables; poultry; sauces; seafood; soups; stocks; meat, poultry and fish cutting; salads; fancy sandwich; meat cooking; basic desserts and pastry; meat identification; sanitation; receiving and storing; daily records; basic menu construction; salad bar; service preparation.

Institutional Practical — 10 weeks

Institutional practical in cafeteria kitchen.

Training in Industry — 5 weeks

With instructor supervision.

Level 3: A La Carte and Banquet Cook Lab — 5 weeks

Vegetables; soup; meat; poultry; seafood; sauces; buffet advanced work; pastry; yeast; cakes; advanced desserts; basic kitchen management; veal, pork and lamb cutting; storeroom control; banquet service; garde manger; ice carving; beef fat sculpture; curing and marinating; pates; terrines; galantines; a la carte cooking; buffet; banquets.

Production A La Carte/Banquet Hot and Cold Kitchen — 10 weeks

A la carte/banquet practical in Culinaire Dining Room kitchen.

Storing, Receiving, Purchasing and Basic Management — 5 Weeks

Practical in storeroom.

Length of Program

15 months consisting of three 5-month levels

Prerequisite

Good health, a high standard of personal hygiene and the ability to stand and walk as required during busy periods. All applicants



will be required to present a recent Health Certificate as required by the Department of Health for the handling of food, and proof of a recent TB test upon confirmation of a start date.

A challenge examination may be taken by anyone who has had industry experience or High School Career Preparation courses. Full credit for the next level of training will be given on the successful completion of the examination.

Level 1: Grade 10 or mature student.

Level 2: Successful completion of Level 1 or challenge examination for Level 1.

Level 3: Successful completion of Level 2 or challenge examination for Level 2.

Note: The Professional Cook Training program has three levels of instruction. Students must make application to all levels desired. Students are not guaranteed entry into the next level of training, and breaks in training could occur due to late applications, insufficient space in the next level or unsuccessful completion of previous level.

Professional Restaurant Service Trade

The Program

This program gives detailed instruction on how to serve food and beverages to guests in hotels, restaurants, dining rooms and clubs. Students are trained to work confidently in formal and informal settings. Instruction is given in the performance of proper sanitation procedures, rules of service and etiquette, table setting, presenting menus to guests and suggesting food courses and appropriate wines. Students will also be trained to identify and operate bar equipment, carve meat and prepare flaming dishes at table, select and serve wine or alcoholic beverages to guests and to perform cashier duties.

Program Content

Level 1: Coffee Shop and Family Restaurants — 10 weeks

Communications	Food serving
B.C. Food Handlers' Card	Identificaton of basic tableware and equipment
Safety Liquor regulations	Interpretation of the wine menu
Alcoholic beverage classification	Principles and methods of cooking
Setting of table for service	Familiarization with food preparation (time in kitchens)
Setting and maintaining the dining room	Handling cash
Closing duties	Reservations, greeting and seating of guests
Menu product knowledge	
Menu presentation	
Menu terminology	
Selling techniques	

Level 2: Classical Dining Service — 10 weeks

Identification of career opportunities	French service
Knowledge of your establishment and city	Supervisory duties
Identification of employer/employee responsibilities	Gueridon service
Survival first aid	Banquet service
Fire safety	Origins of spirits
Loss prevention and security	Origins of wines
Food storage	Basic mixology
Mise en scene	Wine selection and service
Identifying basic tableware and equipment	Flambe beverage
Mise en place	Basic food chemistry
Merchandising	Garde manger
Menu planning	Hot kitchen
Active selling	Classical desserts
Russian service	Food and beverage control
	Hospitality law
	Electronic cash register operation
	Performing hosting duties

Length of Program

Level 1 — 10 weeks
Level 2 — 10 weeks

Career Potential

Restaurants, coffee shops, dining rooms, hotels, motels, private clubs and tourist resorts.

Prerequisite

Good health, a high standard of personal hygiene and the ability to stand and walk as required during busy periods. All applicants will be required to present a recent Health Certificate as required by the Department of Health for the handling of food, and proof of a recent TB test upon confirmation of a start date.



Prerequisite to Level 2 is successful completion of Level 1 or extensive experience equivalent to that standard.

Please note: The Professional Restaurant Service program has two levels of instruction. Students must make application to both levels if desired.



Retail Meat Processing Trade

The Program

The meat processing course is designed to teach the many aspects of meat cutting and provide an environment in which students can be exposed to the efficiency, effectiveness and economics of current meat merchandising in preparation for employment. The training centre is well equipped with power machinery and the necessary meat cutting accessories. Maintenance, sanitation and proper care of equipment are stressed, and principles of safety are observed and practiced at all times. An introduction to merchandising and basic shop management is also provided through practical experience. Students are encouraged to take pride in their work for personal satisfaction and for good consumer relations. On-the-job training in industry for two weeks gives exposure to the retail meat industry which is very beneficial.

Program Content

Level 1: Primary meat cutting provides training for persons who wish to seek employment in packing house locker plants or related fields. It provides sufficient meat cutting basics for those who have shown the necessary ability and potential for further advanced training.

Level 2: Advanced meat cutting provides training oriented toward making students more readily employable in retail meat outlets.

Safety	Self-service meat case merchandising
Sanitation in the work area	Processing poultry, pork, lamb, veal, fish and beef
Personal and equipment hygiene	Receiving
Wholesale and block-ready primals	Basic management and all aspects of meat cutting
Retail block-ready cuts	Use and care of equipment and hand tools
Processing freezer orders	Customer relations
Service meat case merchandising	

Length of Program

6 months (Level 1: Primary Meat Cutting 3 months; Level 2: Advanced Meat Cutting 3 months)

Prerequisite

Grade 10 or mature student. Applicants will be required to present a recent medical certificate and proof of recent chest x-ray or TB test upon confirmation of a start date.

Career Potential

Following graduation from the retail meat processing course, students may find employment in packing houses, block-ready shops, locker plants and small butcher shops; the more successful students may be employed in supermarkets.



Retail Meat Wrapping Trade

The Program

This program provides training for persons who wish to seek employment in packing houses, locker plants, retail meat shops and related fields. It provides sufficient meat wrapping knowledge and experience to make students more readily employable in the meat industry.

Program Content

Safety and sanitation	Customer contact
Health regulations	Meat identification
Personal hygiene	Shelf life and conversions
WCB regulations	Culling and re-wraps
Use of equipment	Case layout
Housekeeping	Signage
Refrigeration factors (basic)	Inventory (basic)
Meat wrapping	

Length of Program

3 months

Prerequisite

Grade 10 or mature student. Applicants will be required to present a recent medical certificate and proof of recent chest x-ray or TB test upon confirmation of a start date.

Career Potential

Upon successful completion of the meat wrapping program, students may seek employment in retail meat shops, delicatessens and other related shops.

Sausage Making and Smoked Meats Trade

The Program

The manufacturing of sausage and smoked meats for wholesale and retail stores and delicatessens is a highly specialized skill. Training is designed to prepare graduates for employment by teaching all aspects of sausage making. Students are taught to use machinery and hand tools in the sausage making process in a well-equipped training centre with smokehouse and sausage making equipment. Maintenance of sanitation and proper care of equipment are stressed, and principles of safety are observed and practiced at all times. A four week on-the-job training component is provided. Students will be placed in areas of the industry appropriate to their training. An introduction to merchandising and shop management is also provided. Students are encouraged to take pride in their work for personal satisfaction and for good customer relations.

Program Content

All aspects of sausage making and smoked meats
Use and care of equipment and hand tools
Sanitation in the working area
Personal and equipment hygiene
Safety practices
Introduction to merchandising and shop management
Customer relations

Length of Program

8 months

Prerequisite

Grade 10. Mature students who do not meet the educational requirements may have related work experience assessed. Good health and physical ability are required, along with a determination to succeed. Applicants will be required to present a recent medical certificate and proof of recent chest x-ray or TB test upon confirmation of a start date.

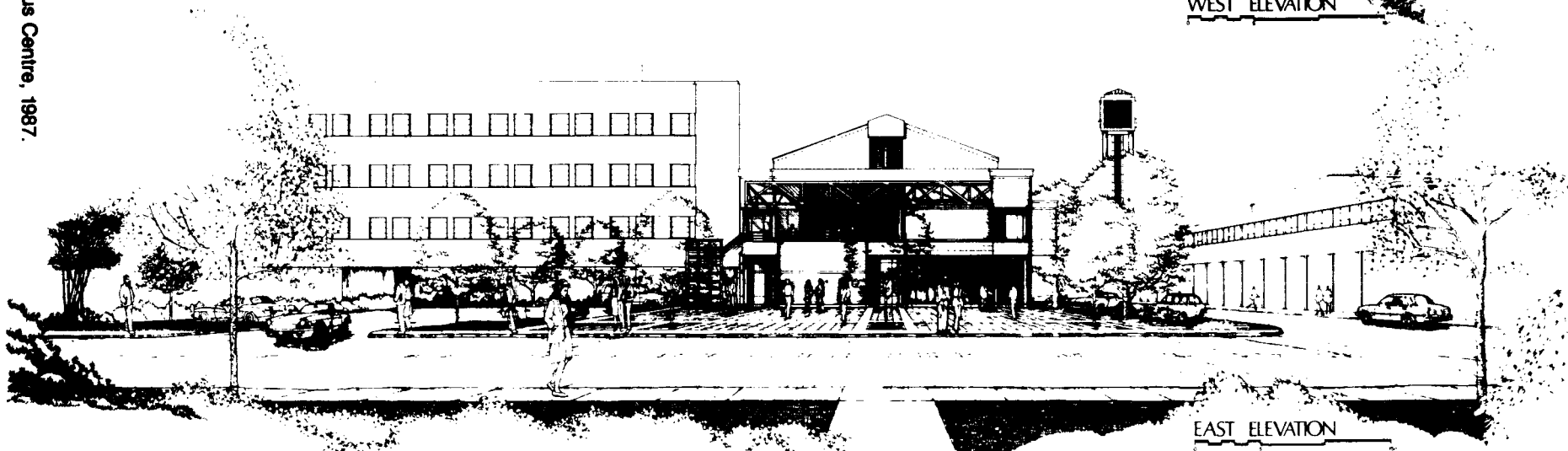
Career Potential

Graduates of the Sausage Making and Smoked Meats program may obtain employment in supermarkets, independent butcher shops, sausage making shops, delicatessens and packing houses.





WEST ELEVATION



EAST ELEVATION

School of Academic and Vocational Studies

Office of the Dean

Henry Arthur, B.A.(Hons.), M.A., Dean
— Administrative Assistant/Executive Secretary to the Dean
Judy Cowland, Clerk/Typist

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The School of Academic and Vocational Studies consists of the Chemistry, Communication, Mathematics, Physics, Vocational programs and Continuing Education departments. It offers courses and services to all students enrolled in technology programs offered by the Schools of Computing and Electro-Mechanical Studies, Construction and Natural Resource Studies, Health Science Studies and Management Studies, as well as courses and services for part-time students. It also offers non-credit pre-entry courses to students who need to upgrade their academic prerequisites for admission to BCIT.

Courses taught by the School of Academic and Vocational Studies departments include the "core" of knowledge and skills, both theoretical and applied, which students need in order to understand and make the best use of their specialized technological training. Academic support courses are developed in conjunction with technology departments and advisory committees, and maintain an appropriate balance between applied and theoretical content.

Faculty and Staff

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 Anita Willson, B.A., M.A.
 Susan Woo, B.Sc.

The School of Academic and Vocational Studies offers Communication, Chemistry, Mathematics and Physics course components for full-time and part-time programs.

Pre-entry courses are offered throughout the year to students needing entrance requirements for BCIT. These courses will be of interest to mature students who need refreshers, or to students who do not have the necessary prerequisites for entrance into BCIT programs.

Academic support courses are offered throughout the year in many forms:

- as part-time evening classes
- as part of full-time program requirements.
- as part-time day-time classes (usually in the summer term)
- as integrated 15 week packages (through Technology Fundamentals, in both September and January)

Interested students are encouraged to call 432-8458 for further information.

Special In-House Communication Courses

All BCIT Communication courses can be delivered in-house for interested groups in 3-day, week-long, or other flexible formats. These are practical courses designed to help you write effectively on the job. Special courses can also be designed to meet company communication requirements. Instructors will conduct needs assessments in your company and design relevant course materials. Please call the Communication Department at 432-8387 for more information.

English Language Proficiency Requirement

Students enrolling in Part-time Communication courses who have severe language difficulties may be referred to other, more appropriate courses.

Pre-entry Courses

Pre-entry courses are individual day or night courses available for students who lack the necessary prerequisites to apply for their chosen technology programs, or for those who wish to prepare for a full-time workload.

Pre-entry courses are offered in each of the BCIT terms: September, January, April and throughout the summer months (check the Part-time Studies flyer for dates, or phone 432-8458).

The following Pre-entry courses are offered to those who need prerequisites or who wish to improve their existing grades:

Technical Mathematics: Introduction — For School of Health Science Studies and the Schools of Engineering Studies

Effective Writing — Preparation courses for every Technology

Independent Learning Skills — Preparation courses for every Technology

Comprehensive Reading, Writing and Learning Skills — BCIT equivalent of English 12 for every Technology

Technical English as a Second Language — BCIT equivalent of English 12 for English as a Second Language Students

Chemistry 1 — Chemistry 11

Physics — Physics 11

Course Descriptions

Chemistry

CHEM 001 Pre-entry Chemistry 1 — An upgrading course for people whose background in chemistry is weak, and a refresher course for those who have not studied chemistry for several years. Meets the Chemistry 11 program entrance requirements for BCIT. **non credit**

CHEM 101 Applied Chemical Principles 1 — Provides the necessary background for chemical calculations and analysis. Included are stoichiometry, atomic structure, bonding, solution preparation and acid-base and oxidation-reduction reactions and their titrations. Lab work consists of qualitative and quantitative analysis using good lab technique. This course meets the Chemistry 12 entrance requirement for BCIT. Prerequisite: Chemistry 11 or CHEM 001. **6 credits**

Communication

COMM 001 Effective Writing — Develops the basic skills needed for the business and technical writing at BCIT. This 24-hour course prepares you for the heavy writing requirements in day school programs. You will find this course especially useful if you are uncertain of your skills in business and technical writing. Topics include organization, paragraph development and effective sentences in letter and memo writing. **non credit**

COMM 002 Independent Learning Skills — This course teaches you how to study on your own, manage your time, cope with heavy workloads and get the most from new instructional techniques. It includes reading textbooks, learning from objectives, using computer-managed learning packages, reading efficiently, completing assignments, taking exams successfully and managing your time. Especially useful for students entering the Electrical options. **non credit**

COMM 003 Comprehensive Reading, Writing and Learning Skills — An integrated 80 hour course which emphasizes the reading, writing and study skills needed for entering a full-time program at BCIT. This course covers all the topics outlined in COMM 001 and COMM 002 as well as speed reading, reading comprehension, library research, short report and format. If your mark in B.C. English 12 does not meet BCIT's entrance requirements, 65% or better in this course will meet BCIT's C in English 12 entrance requirement for day school programs. **non credit**

COMM 004 Technical English as a Second Language — This 80-hour course is for students whose first language is not English, who have studied English, but need practice in applying their language skills to technical studies or need to upgrade their English to meet the Institute's English language requirement. This integrated language course focuses on the reading, writing, listening and speaking skills required for technical communication and will include reading efficiency, vocabulary expansion, sentence and paragraph development. 65% or better in this course will meet BCIT's English 12 entrance requirement for day school programs. **non credit**

Mathematics

MATH 001 Technical Mathematics — An upgrading and/or refresher course for students who have not completed high school math, or have completed it more than three years previously, or whose math background is otherwise weak. This course meets Algebra 12 entrance requirements at BCIT. Students intending to enter a technology which requires an Algebra 12

grade of C+ or better, must achieve a final mark of 65% or higher in MATH 001. Prerequisite: C or better in Algebra 11 or approved equivalent math course. **non credit**

MATH 002 Technical Mathematics — Introduction (Correspondence) — Flexible entry correspondence course that satisfies the Algebra 12 entrance requirements for BCIT. Students intending to enter a BCIT technology which requires an Algebra 12 grade of C+ or better must achieve a final mark of 65% or higher in MATH 002. Students who have difficulty with mathematics or those who have been away from school more than three years are advised to take the classroom course (see P/T offering — MATH 001). Prerequisite: a pass in Algebra 11 or an approved equivalent mathematics course. **non credit**

Physics

PHYS 009 Pre-entry Physics — This course is designed for those students who lack the physics prerequisite to enter their chosen technologies or those who anticipate difficulty in passing the physics course associated with their technology. The course offers an introduction to physics, its basic principles and common applications. Approximately two-thirds of the course deals with mechanics, the remainder with heat and geometric optics. Problem solving techniques are emphasized. Prerequisite: you are advised to have completed any necessary mathematics upgrading courses BEFORE taking PHYS 009. **non credit**

Bridging Program

The School of Academic and Vocational Studies offers a Bridging Program that gives trades and vocational students, graduates and workers the opportunity to enter a BCIT Technology Diploma Program.

The program is designed to help people upgrade their academic skills to a level where they are ready to enter a technology program.

Students will take between two and five courses in Chemistry, Math, Physics and Communication, depending on their current level of skill/education, and the prerequisites for the program they wish to enter. The Bridging Program is approximately 14 weeks long, with an average of 25 hours of class time each week.

For more information on Bridging, call 432-8458.

Technology Fundamentals Program

Technology Fundamentals is an upgrading program to assist full-time studies applicants who lack two or more of the prerequisites for admission into BCIT programs.

Technology Fundamentals is a full-time, day school program (Monday through Friday) beginning in September and January, and running for 15 weeks.

Applicants for admission into Technology Fundamentals must indicate which BCIT Technology program they are applying for and which session (September or January) of the Technology Fundamentals program they wish to enroll. Technology Fundamentals

application forms must also have all necessary documents attached.

Technology Fundamentals students may be guaranteed entry to the full-time technology program of their choice, subject to successful completion of the Technology Fundamentals program. The participating technologies include:

School of Computing and Electro Mechanical Studies
Electrical/Electronics (January session only)
Mechanical
Mechanical Systems

School of Construction and Natural Resource Studies
Biological Sciences
Building
Chemical Sciences
Civil and Structural
Forest Resources — Forestry option
Mining
Petroleum Technology
Survey
Wood Products Manufacturing

School of Health Science Studies
Environmental Health
Health Information Technology — Health Record Technician
Occupational Health and Safety

For further information contact 432-8419.

Industrial Education Teacher Education Program

In BCIT's Industrial Education Teacher Education (IETE) program students acquire the content area skills and knowledge to teach industrial education in B.C. junior and senior secondary schools. The program may also lead to trades teaching at the post secondary level when combined with a trades qualification.

Regular Program

IETE is a two-year program that provides the student with the content qualifications to teach the five industrial education areas in the B.C. curriculum and the junior secondary level, and one or two of these areas plus Technology 11 at the senior secondary level. The five areas are drafting, woodworking, metalworking, electronics and power mechanics/automotive.

In addition to the two-year BCIT program, students intending to teach in secondary schools will also be required to obtain a B.Ed. degree which, under an agreement with UBC, will normally take an additional three years. The first of these years consists of first-year general university courses, which the applicant is encouraged to take before applying to BCIT; the final two consist of senior level university academic and education courses. Applicants should contact the Admissions Office at UBC regarding admissibility to that institution.

The BCIT program is open to graduates of secondary schools with good English and Mathematics skills. Preference will be given to applicants with trades experience and/or first year university transfer courses completed.

Accelerated Program

Applicants with journeyman standing or equivalent in a trade related to one of the five IE subject areas, who meet the requirements of the regular program, may enter the accelerated program, which is designed to permit successful students to begin teaching with provisional certification after two years or less. Completion of the requirements for the B.Ed. degree and regular certification may be completed through part-time evening and summer courses.

Program Changes

Since the IETE program is currently under review, some changes may be instituted for the 1987/88 academic year. Applicants should contact the Program Head, Industrial Education Teacher Education at BCIT for further information.

Course Descriptions

INED 510/610 Principles of Industrial Design — Covers the basic principles of design, relationship between design and manufacturing processes, aesthetic elements of design, design in classroom projects.

INED 520/620 Introduction to Teaching Technical Drawing — Covers the basic concepts and skills taught in drafting courses at the junior secondary level, using projects as a teaching tool, integrating drafting and design with projects in other subjects, effective use of equipment and materials, introduction to using computers in the drafting classroom.

INED 530/630 Introduction to Teaching Woodworking — Covers the equipment, materials and skills necessary to teach wood, plastic and other soft materials at the junior secondary level; safe use and maintenance of light and heavy machinery with the adolescent student; management of individually produced student projects.

INED 540/640 Introduction to Teaching Metalworking — Covers the equipment, materials and skills necessary to teach metal materials at the junior secondary level; maintenance and safe use of light and heavy machinery and high temperature processes with the adolescent student; management of student projects.

INED 550/650 Teaching Power Mechanics — Covers the mechanics of various power sources from the internal combustion engine to turbines, transmission of power and principles of power application; design of projects for the study of power with application to mechanics shops and technology courses.

INED 560/660 Introduction to Teaching Electricity and Electronics — Covers the basic concepts of electricity and electronics taught at the junior secondary level; the use of experiments and projects for teaching electronics, electrical shop control, planning and safety, effective use of equipment and materials.

INED 570/670 Technology of Materials — Covers the properties of all materials commonly used in the school shop and their educational uses, materials testing, safe uses of materials in the shop, specific application to teaching technology courses at the secondary level. Prerequisite: INED 510, INED 520, INED 530, INED 540, INED 550 (may be taken concurrently).

INED 580/680 Projects — Directed studies and research projects in IE subject areas.

INED 710/810 Advanced Design — Covers the elements of industrial design as they affect manufacturing processes and large student projects. Prerequisite: INED 610.

INED 720/820 Teaching Advanced Technical Drawing — Covers the concepts and skills taught in drafting courses at the senior secondary level and in Career Preparation programs, the use of CAD in drafting courses, advanced projects. Prerequisite: INED 620.

INED 730/830 Teaching Advanced Woodworking — Covers the equipment, materials and skills necessary to teach wood, plastic and other soft materials at the senior secondary level for Industrial Education and career preparation students; management of large and mass produced student projects, uses of plastics and less common materials. Prerequisite: INED 630.

INED 740/840 Teaching Advanced Metalworking — Covers the equipment, materials and skills necessary to teach metal materials at the senior secondary level; casting, forging and other work in light and heavy metals, advanced machining and NC/CNC machining. Prerequisite: INED 640.

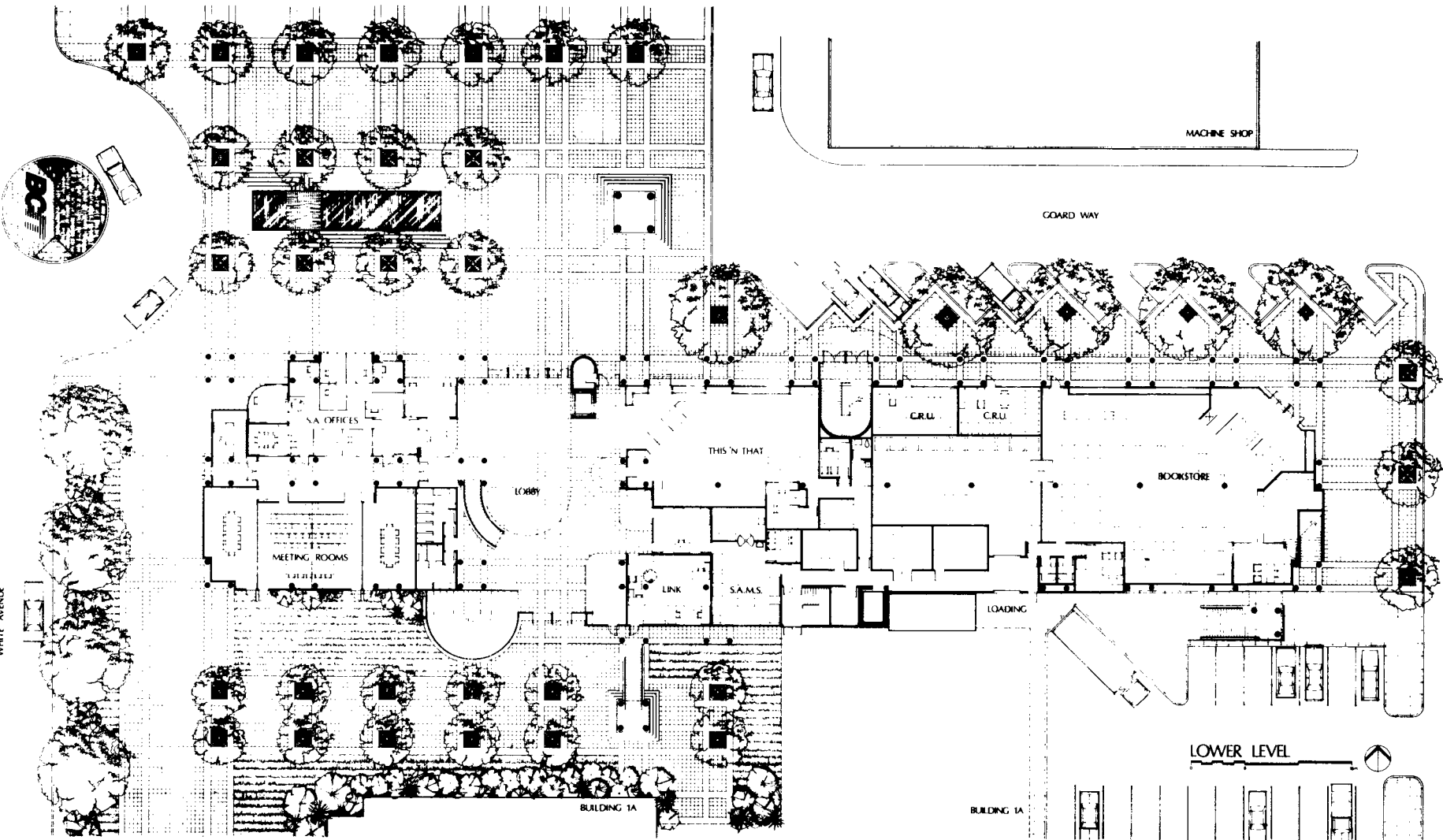
INED 750/850 Teaching the General Automotive Shop — Covers the skills students need to master in senior and career preparation automotive shops, shop management, supervising student work on clients' cars. Prerequisite: INED 650.

INED 760/860 Teaching Advanced Electronics — Covers the concepts of electronics taught at the senior secondary level, the use of experiments and projects for teaching linear, digital and microprocessor materials and projects. Prerequisite: INED 660.

A number of specialized advanced courses will be offered during summer and evening sessions. These courses will enable teachers to upgrade specialized skills and add new teaching areas.

Faculty

David McNeal, B.A., M.A., Ph.D., Acting Head
Angus Fraser, B.Ed., M.Ed.
Sydney Lee, B.Ed., M.Ed.
Peter Trant, B.Ed., M.A.



Diploma Programs

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Office of the Registrar

Mario Mazziotti, Dipl.T., Registrar
Mike Powley, B.Ed., M.B.A., Assistant Registrar (Acting)
Angela Evans, Systems Assistant

Registration

Kelly Durkin, Supervisor, Registration
General enquiries: 434-1610

Admissions

Brenda Walton, Supervisor, Admissions
General enquiries: Trades 432-8229
Technology 432-8419

Student Records

Jeri Fostvelt, Supervisor, Student Records
General enquiries: Trades 432-8228
Technology 432-8478

Timetabling

George Brown, Supervisor, Timetabling
General enquiries: 434-5734 (5386)

FULL-TIME TECHNOLOGY ADMISSIONS INFORMATION

Burnaby is our main campus and primary location for processing applications and maintaining permanent student records. However, registration is possible at various campus sites including the Downtown Education Centre (549 Howe Street, Vancouver); Sea Island (Vancouver International Airport) for Aviation Trades programs; the North Shore Access Centre and Surrey (Princess Margaret Senior Secondary School) for courses taking place at these sites.

The Office of the Registrar operates under Institute approved policies and procedures. This information is available at all locations.

Admissions Policy

BCIT's primary purpose is to provide official high quality, post-secondary technological education for residents of British Columbia and Canada.

Applicant priority is given first to British Columbia residents who are Canadian citizens and landed immigrants who have lived in British Columbia for the immediate twelve months prior to enrolment; second priority is given to out-of-province Canadian citizens and landed immigrants, third priority is given to out-of-country applicants. BCIT does not accept applications from persons on visitors visas.

All applicants must provide official documentary proof that they meet the necessary Institute and technology prerequisites. Applicants lacking specific prerequisite courses or adequate grades will be referred for upgrading. Please note, where necessary, students applying to BCIT are requested to submit all documentation with English translations.

Prompt and equitable attention will be given to all applications to ensure applicants maximum availability of the more than 50 excellent technological programs leading to National Diplomas. In those programs where the number of applications exceed available seats, BCIT will select those students deemed to have the best opportunity for success.

Entry to some programs is possible several times a year. For this information, check "when to apply".



Policy subject to change.

While all prospective students must be at least 16 years of age, there is no upper age limit.

Academic Requirements for Admission

Graduation from a senior secondary school with satisfactory grades, as prescribed by the British Columbia Ministry of Education. In addition, candidates must meet special technology prerequisites. See **Technology Prerequisites**, this section, and individual technology sections.

English Language Proficiency

English 12 is required for general admission to the Institute. However, for those B.C. applicants who wish to complete the high school Communications program to meet BCIT's English requirement, the following combinations are acceptable for September 1988 admissions:

1. Communications 11 and 12 with a "B" standing in Communications 12;
2. English 11 and Communications 12 with a "C" standing in Communications 12;
3. Communications 11 and English 12 with a "C" standing in English 12.

Where a technology specifically requires a "C+" standing in English 12, this standing is required in 2 or 3 above.

English 12 Minimum Essentials is not acceptable as a substitute for English 12.

Since all BCIT students are expected to possess an acceptable level of language skills, applicants whose primary language is not English may be required to demonstrate their competence in one of the following ways:

1. by scoring a minimum of 145 on the Vancouver Community College English Language Assessment Test;
2. by scoring a minimum of 550 on the TOEFL;
3. by successfully completing English 099 at Vancouver Community College; or equivalent, or;
4. by individual assessment by the Communication Department.

To obtain an information bulletin which outlines world-wide test locations and application procedures, applicants should contact: Test of English as a Foreign Language, Box 889, Princeton, New Jersey, 08540, U.S.A.

Mature Student

1. A person not eligible for admission under any other category may apply as a mature student.
2. Admission under this category is at the discretion of the Registrar on the recommendation of individual Technology Department Heads. The Department Head must be satisfied that the applicant has sufficiently clear objectives, and can provide evidence of probable success in the technology of his/her choice. The Department Head may, at his/her discretion, require applicants to have an interview or take appropriate tests. Along with their application, applicants must submit a statement of intent outlining their reasons for applying. Enquiries regarding admissions under this category should be directed to individual Department Heads by the Registrar.
3. All applicants intending to take advantage of this admission procedure are strongly advised to contact the Office of the Registrar at least twelve months prior to the expected date of admission.
4. Mature students must submit all supporting official documents with their applications.

Second Year Regional College Transfer

BCIT offers transfer programs for various technologies from recognized regional colleges within British Columbia. Further information may be obtained by directing your inquiry to the Office of the Registrar.

Direct Entry

Those persons who have successfully completed one or more years of study at a level equal to, or higher than, that of a BCIT full-time day program may apply for direct entry into second or third term/level of a program, providing a seat is available, course content is similar and, in the opinion of the Registrar, the applicant's academic record justifies advanced standing.

Readmission

Students may interrupt their studies after the completion of any term/level. However, an application form must be completed and submitted to the Office of the Registrar, to request readmission into the Institute.

Part-time Day Courses

Students may register in courses given in full-time programs subject to the approval of the technology head, space being available, and official proof that prerequisites have been met.

A student making application for part-time day classes must obtain the signature of the technology head and instructor of each course using the form "Application for Part-time Day Courses" available at the Office of the Registrar. All completed forms must be returned to the Student Records Office; registration will be permitted upon acceptance. Tuition fees are due and payable at registration time.

Technology Prerequisites

School of Computing and Electro-Mechanical Studies

Applied Industrial Computing (AIC) Technology
CAD/CAM — Algebra 12, Physics 11

Post-diploma Programs

Spatial Information Systems — Diploma of Technology or equivalent

Advanced Manufacturing — Diploma of Technology or equivalent

Resource Processing — Diploma of Technology or equivalent

Computer Systems — At least 6 grade 11 or 12 academic courses (arts and sciences), including English 12 and Algebra 11. Second year options: we specifically recommend Algebra 12 for Decision Systems and Physics 11 or 12 and Algebra 12 for Engineering Systems.

In the case of mature students, academic transcripts may be supplemented by relevant business experience, successful recent completion of relevant BCIT Part-time Studies courses with 75% or successful completion of relevant courses at other post secondary institutions with 75%. Candidates may be asked to write an aptitude test to aid in the selection process.

Electrical/Electronics — Algebra 12, Physics 11 and Chemistry 11 all with C+ standing

Mechanical — Algebra 12 and Physics 11

Mechanical Systems — Algebra 12 and Physics 11

Plastics — Algebra 12 and Chemistry 11 or Physics 11

Robotics — Algebra 12 and Physics 11 both with C+ standing

School of Construction and Natural Resource Studies

Biological Sciences — Algebra 12 and Chemistry 11

Bioengineering — Algebra 12 and Chemistry 11

Building — English 12, Algebra 12 and Physics 11

Chemical Sciences — Algebra 12 and Chemistry 11

Post-diploma Program

Non-destructive Testing and Quality Assurance — Diploma of Technology or equivalent.

Civil and Structural — Algebra 12 and Physics 11

Forest Resource Technology:

Fish, Wildlife and Recreation — Algebra 11 with C+ standing; Biology 11 and one of the following: another Science 11, Science 12 or Algebra 12. Resume required with all applications

Forestry — Algebra 11 with C+ standing; a Science 11 and any one of another Science 11, or a Science 12, or Algebra 12

Post-diploma Program

Natural Resource Management — Graduation from a BCIT diploma program in an engineering or business technology. Baccalaureate degree in Bio-Science, Engineering, Geography or Geology will also be considered

Petroleum Technology — Algebra 12, Chemistry 11 or Physics 11

Mining — Algebra 12, Physics 11 and Chemistry 11

Surveying — Algebra 12 and Physics 11

Wood Products Manufacturing — Algebra 12 and one science 11 (Biology, Chemistry or Physics)

Note: Please refer to page of the Admissions section, if you wish to be considered under the Mature Student category.

Important

Where an algebra course requirement is specified in Engineering and Health Science, please note that Academic Math 12 completed before 1978 is an acceptable prerequisite.

SEE PROGRAM DESCRIPTION PAGES FOR OTHER PROGRAM PREREQUISITES.

School of Health Science Studies

Biomedical Electronics, Electrophysiology — Algebra 12, Physics 11 and Chemistry 11 all with a C+ standing

Diagnostic Medical Sonography — Completion of a two year allied health program such as Radiography, Nuclear Medicine Technology or General Nursing, or a Bachelor of Science or equivalent in a health-related science. Based upon the documentation submitted, the most suitable applicants will be invited to an interview.

Environmental Health — Algebra 12, Physics 11 and Chemistry 12

General Nursing (R.N.) — **Under 23 years at time of entry:** Senior secondary school graduation with: Chemistry 11, either Chemistry 12 or Biology 12 and English 12 all with a C+ standing; Algebra 11 with C standing. **Over 23 years at time of entry:** Senior secondary school graduation or equivalent with: Chemistry 11, either Chemistry 12 or Biology 12, all with a C+ standing. English 12 with a C+ standing is desirable. The St. John Ambulance Standard First-Aid certificate is required by the end of term 1

Health Information Technology:

Health Record Administrator: Algebra 12, Biology 12 and proficiency in typing (approx. 50 wpm)

Health Record Technician: Algebra 12, Biology 12 and proficiency in typing (approx. 50 wpm)

Medical Laboratory — The following First Year University-level courses (or their equivalent in a Community College) are the prerequisites for entry into the Medical Laboratory Technology program:

Biology	UBC 101 or 102
Chemistry	UBC 110 or 120
Physics	UBC 110 or 115
English	UBC 100
Mathematics	UBC 3 credits at the Math 100 level**

A complete First Year Science Program. 15 credits at UBC (or its equivalent at a Community College) is required for entry into the program. Applicants who do not have the appropriate courses and credits (or their equivalent) will not be considered eligible.

* All applicants who meet or are completing the academic entrance requirements will be interviewed in approximately April.

** No specific Mathematics courses are recommended. However, a total of 3 UBC credits at the Math 100 level (or its equivalent) are required. Calculus or Statistics courses are acceptable. Applicants should be aware that, in the event that their application to Medical Laboratory is not successful, Calculus courses are required for entry into most second year university science programs.

Medical Radiography — Algebra 12, Physics 11, Biology 11, Physics or Biology 12, prerequisites. C+ average is required). Current CPR Level 1 Certificate required.

Nuclear Medicine Technology — Algebra 12, Chemistry 11 and 12, and one other Science 11 (Physics 11 desirable)

Occupational Health and Safety — Algebra 12, Chemistry 11 and Physics 11

Prosthetics and Orthotics — Algebra 12 and Physics 11. Course in metalwork and woodwork are recommended. Note that this program offers an entry once every two years only. The next session begins September, 1988.

Note: Please refer to page of the Admissions section, if you wish to be considered under the Mature Student category.

Important

Where an algebra course requirement is specified in Engineering and Health Science, please note that Academic Math 12 completed before 1978 is an acceptable prerequisite.

SEE PROGRAM DESCRIPTION PAGES FOR OTHER PROGRAM PREREQUISITES.

School of Management Studies

Administrative Management Systems — Algebra 11 and English 12 both with a C+

Broadcast Communications

Radio, Television, Journalism — All applicants must be able to type 25 wpm, and submit a short essay, approximately 500 words, detailing reasons for choosing Broadcasting as a career

Business Administration — A one year post diploma program. Graduation from a BCIT diploma program or a two year college program in an engineering or health technology, or equivalent

Financial Management — Algebra 11 and English 12 both with C+. Candidates who do not meet this requirement are to include

with their application, a letter (with references) outlining their career objectives and reasons for selecting Financial Management to enable the departmental selection committee to consider their application

Hospitality and Tourism Administration — English 12 and Algebra 11 both with a C+ standing

Marketing Management — Algebra 11 and English 12 both with a C+ standing

Operations Management — Algebra 11 with a C+ standing. Physics 11 is desirable

Transportation/Distribution Management and International Major — Algebra 11 with a C+ standing. Physics 11 is desirable

Note: Please refer to page of the Admissions section, if you wish to be considered under the Mature Student category.

SEE PROGRAM DESCRIPTION PAGES FOR OTHER PROGRAM PREREQUISITES.

Basic Training for Skills Development Upgrading — Level 4

Experience has indicated that those students who have taken the five months upgrading course could not successfully compete with those students who have an academic level of achievement in Engineering, Health and certain Management technologies. The mathematics and sciences which BCIT students are required to assimilate are too difficult for those who have had such limited exposure to these subjects. Students who have taken the upgrading course are still required to have Grade 12 level special technology prerequisites.

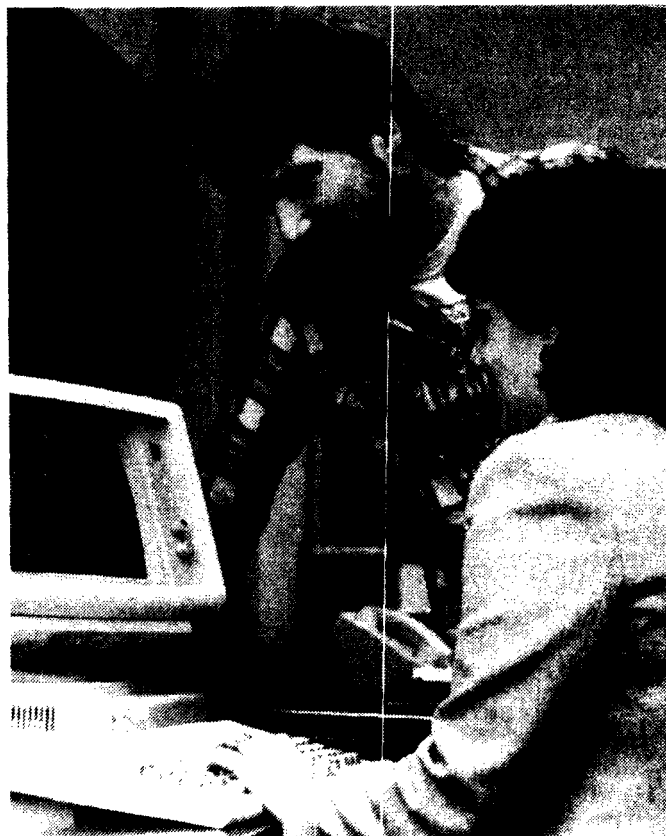
General Educational Development Tests

These tests are designed for people who have not completed high school graduation but who, because of experience, have presumably reached a level of general development equivalent to high school graduation. Unfortunately, whatever general development a person may have accomplished, mathematical and science ability and knowledge may not necessarily have been strengthened.

Therefore, success in the General Educational Development Tests is considered to be equivalent to BCIT general prerequisites; that is, graduation from a senior secondary school. Applicants who are successful in these tests are required to achieve satisfactory standings in the special Grade 11 and 12 prerequisites specified by the technology they have applied to.

How to Make up Course Deficiencies

Preparatory programs are available through the School of Academic and Vocational Studies for those students who lack specific prerequisites or desire refresher courses. For information, contact Program Information at 432-8433.



Technology Fundamentals

Technology Fundamentals is an upgrading program to assist full-time studies applicants who lack two or more of the prerequisites for admission into BCIT programs.

Technology Fundamentals is a full-time, day school program (Monday through Friday) beginning in September and January, and running for 15 weeks.

For admission into Technology Fundamentals, applicants **must** indicate which BCIT technology program they are applying for and which session (September or January) of the Technology Fundamentals program they wish to enroll in. Applicants must attach all necessary supporting documents.

Technology Fundamentals students may be guaranteed entry to their full-time technology programs, subject to successful completion of the Technology Fundamentals program and in some cases, nonacademic requirements. Participating technologies include:

- Biological Sciences
- Building
- Chemical Sciences
- Civil and Structural
- Electrical/Electronics (January intake only)
- Environmental Health
- Forest Resource — Forestry
- Health Information Technology — Health Record Technician
- Mechanical Systems
- Mining
- Petroleum Technology
- Occupational Health and Safety
- Survey
- Wood Products Manufacturing

For further information contact 432-8433.

How to Apply

Applications for admission to a program should be submitted as early as possible, as some programs at BCIT have a limited number of seats available. Application forms and additional information may be obtained from the Office of the Registrar. These forms should be completed and returned with the necessary **official** documents attached. See Document Requirements.

When to Apply — Full-Time Programs

Applications for admission into full-time programs are accepted for processing from the dates shown below to 14 days after the commencement of classes.

Term Starting

September 1987

- All Programs including August Nursing and Medical Laboratory

Processing Date

January 2, 1987

January 1988

- Administrative Management
- Medical Radiography
- Computer Systems
- Electrical/Electronics
- General Nursing
- Financial Management
- Marketing Management

June 2, 1987

September 1988

- All programs including August Nursing and Medical Laboratory

October 1, 1987

Applicant Status Categories

Candidates making application to BCIT will receive correspondence informing them of their status according to the following guidelines:

Acceptance — The applicant who meets the requirements of the Institute and the program may be fully accepted.

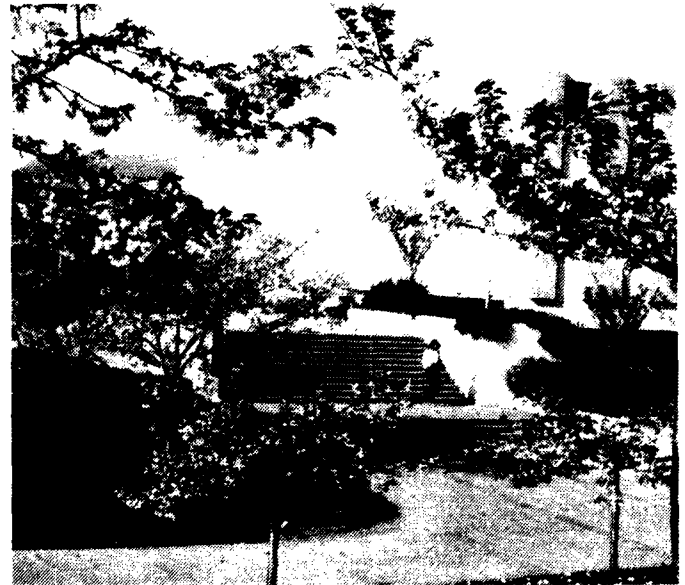
Provisional Acceptance — A decision to accept provisionally is based upon the initial information submitted by the applicant. Full acceptance is dependent on final data submitted and applicability to criteria.

Wait Lists — When all seats in a program are filled, a wait list of qualified applicants is generated. If a space becomes available, an applicant on the wait list will be given the seat. Waitlists are not transferred to following sessions. We encourage applicants to contact Admissions who may suggest other similar programs in which seats are available.

Non-Acceptance — The applicant does not meet the requirements of the Institute and/or the program is full and closed.

Final acceptance or non-acceptance by BCIT is based on the decision of the Registrar. BCIT reserves the right to accept only those applicants who appear to have the capabilities necessary to succeed in the chosen programs.

Acceptance is non-transferable from term to term.



Document Requirements

The following official documents must accompany the completed application form. **Photocopies are not acceptable.**

1. A senior secondary school transcript showing graduation. Applicants who are presently attending high school must submit a statement of marks of grade 11 subjects, and first semester grade 12 marks from the principal's office. A statement showing courses currently attending is also required. All marks must be substantiated by a final secondary school transcript incorporating school marks and provincial exam marks.
2. If applicable, all official post-secondary school statements of marks indicating credits and grades achieved.
3. Applicants who are not Canadian citizens must submit official government documents indicating Landed Immigrant Status or Student Authorization.
4. Transcripts and all other related academic documents must be translated into English and notarized at the applicant's expense.

5. School of Health Sciences applicants are required to complete a medical questionnaire and return it to the Medical Services Department at BCIT. Some health technologies require students to present evidence of having had a recent chest x-ray as well as having completed an immunization program. You will be notified if this information is required from you. If, due to extenuating circumstances, supporting documentation is not available at the time, students will be required to complete the necessary procedures at Medical Services, at BCIT.

6. Students who have been selected for admission must have medical insurance coverage prior to registration.

Non-Canadian students who have been selected for admission must apply in person to the Medical Services Department, for an Application for Student Medical and Hospital Plan, prior to attending BCIT. Payment for this medical coverage is to be made at the same time, either by personal cheque or money order, to the vendor of the policy. Proof of coverage will be required.

7. Applicants who voluntarily withdrew or were withdrawn from another Institute may be requested by the teaching department to provide a written report explaining the reason and/or written authorization to request a report from the previous Institute. These documents can be used to determine acceptance to the desired program.

Note: Whether or not a person is accepted for admission, academic documents are not returned. Applications and documents are not maintained by the Institute for those applicants who are accepted and are unable to enrol, or for those candidates who have not been accepted. If making re-application to BCIT, a new application must be completed and all supporting documents must be resubmitted.

Course Credit, Course Exemption and Advanced Standing

Course exemption may be granted for courses taken previously at BCIT.

Course credit may be granted for individual subjects taken at BCIT or other recognized post-secondary institutions, when the course is equivalent in content to the course for which credit is sought.

Guidelines

- First year diploma and post-diploma students may only apply for course credit/exemption after they have been fully accepted and paid their commitment/term fees.
- Second year students, who are direct entrants to BCIT, may apply for course credit/exemption upon receiving full acceptance.
- Students who are presently enrolled at BCIT may apply for course credit/exemption at any time within the academic year.

Course credit/exemption may be applied for each term or on an academic year basis. Applications for the next term will be processed approximately half way through the current term.

Course credit/exemption is granted or denied by the Registrar upon recommendation by the technology department head and/or the teaching department head.

If course credit/exemption is granted and not replaced with an approved course of equal duration, you will not be eligible for BCIT scholarships. However, if you are registered in courses for which the weekly hours total at least 60% of the weekly hours for the full program, you may apply for a B.C. Student Loan or Canada Student Loan. In order to be eligible to receive an

HONORS diploma or GRADUATING AWARD, SECOND YEAR students who receive course credit/exemption or advanced standing in one or more subjects must register in a substitute course approved for this purpose by the department head.

Applications for course credit/exemption must be submitted to the Office of the Registrar no later than 14 calendar days after the commencement of classes each term. Late applications will only be accepted if prior written authorization has been received by the Registrar from the technology department head.

Change of Program

After the commencement of classes, a request for program transfer requires the completion of a Program Change form by the student. It is the responsibility of the student to obtain approval and signatures from the appropriate Department Head, Dean and Registrar. Permission must be granted by the Registrar before a change in program can be affected.

Course Credit

A credit is defined as approximately one classroom hour per week over a 12-15 week term. Therefore, a course taught for three hours per week for 12 weeks would normally be assigned three credits.

It is recognized that in assigning credits to courses, other criteria are also considered, such as:

- course content
- learning outcomes
- whether it is a lab (clinical or practicum)

Certificates and Diplomas

Although BCIT has recently changed over from a system of **units** to the **credit** system as defined above, we are still in the process of reviewing our certificates and diploma requirements in terms of number of credits.

Transfer from Full-Time Studies to Part-time Studies

A student transferring to part-time studies from a full-time diploma program will generally be granted credit exemption for all courses successfully completed prior to withdrawal from full-time studies. A student who fails one or more subjects in the full-time program is encouraged to consider part-time studies programs.

Examinations, Grading and Marks

Formal examinations are written at the end of each term. Students are required to take the examinations for each course at the time set by the Institute.

For full-time students, mid-term examination papers may be returned. Only those examinations designated as "restricted exams" by the Dean shall not be returned.

Determination of Standing

Final standing is determined on the basis of term progress and examination results. Full-time students subject standings are reviewed by a School Marks Review Committee where final standing is determined. Subject standing is as follows:

- 1 — First class 80% or more
- 2 — Second class 65% to 79%

- | | |
|-------------|--|
| 3 — Pass | 50% to 64% |
| 4 — Failure | less than 50% or unapproved/unofficial withdrawal from subject or program. |

Note: Due to the nature of some trade courses, 70% may be required for a pass mark.

"F" appearing beside a course indicates one of the following:

- a) Failure in the subject
- b) Withdrawal after the deadline (refer to section on Withdrawal from Program Courses.)

A full-time student whose transcript bears such a standing is generally not permitted to proceed to the next term unless granted special permission by letter from the Registrar, after approval by the School Marks Review Committee.

- A Aegrotat — A pass standing based on term marks.
- C Course Credit Granted — Recognition of approved equivalent studies and/or experience or challenge exam.
- EC Exempt Course — Recognition of previous course completion at BCIT.
- PP Provisional Pass — Will be changed to Pass or Fail depending on performance in a subsequent specific course.
- P Provisional Pass Fulfilled — Provisional Pass conditions achieved.
- AP Adjudicated Pass — Standing based on overall performance in the term.
- N Not Complete — Course requirements not completed.
X No examination or grade given for this course.
- S Satisfactory — Course requirements fulfilled, no percentage mark assigned.
- U Unsatisfactory — Course requirements not fulfilled, no percentage mark assigned.
- W Withdrawal — Approved withdrawal from a course or program.

Withdrawal from Program Courses

A full-time student withdrawing from one or more courses after the deadline will receive an "F" on his/her transcript. Withdrawal with permission from his/her Department Head or Dean and within withdrawal deadlines will show a "W" on the transcript. Neglect to withdraw will result with "OF" on his/her transcript. Appeals to the Registrar will be adjudicated by the Registrar and the Dean. It is the student's responsibility to check withdrawal deadlines.

A full-time student withdrawing officially from the whole program, will be allowed to do so until two-thirds of the way through the term and a "W" will show on the transcript. If withdrawing after the deadline, the transcript will show "F" for all courses dropped.

A part-time day student cannot withdraw after two-thirds of the term cut-off date without having an "F" on his/her transcript for the courses dropped.

Distribution of Marks

Students will not be provided with marks prior to the issuance of a Statement of Marks by the Registrar's Office. Marks will not be released over the telephone.

Marks will be mailed to students by the Office of the Registrar. **Note:** A full-time student who has failed a term ending in December (also April and August for Administrative Management,



Financial Management, Marketing Management and Electrical) will be advised by telegram prior to the commencement of the next term. A letter indicating the student's status and the student's Statement of Marks follows the telegram.

Transcripts resulting from final examinations are mailed to graduating students by the Office of the Registrar. All other students will receive a Statement of Marks for the term.

Additional Transcripts

A fee of \$4 for the first copy and \$1 for each additional copy is charged for transcripts. The fee is due at the time the request is made.

Withholding Statement of Marks

No Statement of Marks, transcript, diploma or certificate will be issued until the student has cleared up all financial and other obligations to the Institute such as tuition fees, library fines, rent. These documents may also be withheld on such other grounds as directed by the Board of Governors.

Marks Reassessments

It is the policy of the Institute that students shall be dealt with fairly in all decisions affecting their academic standing. A student who is not satisfied with the final mark award is cautioned that the grade has been reviewed carefully and, aside from clerical error, reassessments seldom result in a higher mark.

A student wishing a reassessment of his/her academic standing must first discuss the matter with the instructor responsible for the initial assessment and, if dissatisfied with the result of that discussion, with the Teaching Department Head.

Failing a resolution of the problem, the student may then submit a Request for Reassessment on the Institute form available from the Office of the Registrar. **ALL PARTS OF THE FORM MUST BE COMPLETED AND MUST REACH THE REGISTRAR'S OFFICE WITHIN 7 SCHOOL DAYS AFTER THE START OF CLASSES IN THE NEXT TERM, OR WITHIN 30 CALENDAR**

DAYS AFTER THE MAILING OF MARKS FROM THE INSTITUTE, WHICHEVER IS LESS.

There is a fee of \$25 for each subject reassessed. If the mark or standing is favorably adjusted, the fee will be refunded.

The Registrar will inform the student by letter of the result of the reassessment.

Marks Appeals

A student who is dissatisfied with the outcome of a reassessment may appeal the decision to the President.

The student must first discuss the problem with the Dean of the appropriate School. The Dean must provide the Registrar with a written statement confirming the outcome of the discussion.

If the student then decides to proceed with the appeal, the student must complete and sign a Request to Appeal form and submit it to the Registrar's Office, along with the \$25 fee, **WITHIN TWO WEEKS OF THE MAILING OF THE REASSESSMENT RESULT TO THE STUDENT.**

An Appeal Committee will be formed to deal with the Appeal according to procedures approved by the Education Council for that purpose.

The President will inform the student by letter, of the result of the appeal.

NOTE: A student who has been permitted to audit classes during the reassessment may continue to do so during the appeal.

Attendance

See Conduct and Attendance, page v.

Failures and Repetition

A student who fails more than one subject in a term may be permitted to repeat the term only at the discretion of the program Dean and the Registrar (see Readmissions procedure under Admissions). It is the responsibility of the student who has failed one or more subjects, but is permitted to continue with his/her program or studies, to present evidence of successful completion of the failed subject(s) to the Office of the Registrar prior to the end of the next term or before a Diploma of Technology is awarded, whichever condition is specified at the time or subsequent to the failure.

Student Research Reports

Some BCIT students are required to research and write reports, with the guidance of faculty and staff, as part of their course work. Unless otherwise specified by the instructor, these reports are assigned as educational exercises only. The student, not BCIT, is ultimately responsible for the content of such a report.

Diplomas

Diploma of Technology

Graduates of the British Columbia Institute of Technology will be awarded a nationally recognized Diploma of Technology at the convocation exercises. Graduates unable to attend the convocation exercises will have their diplomas sent by registered mail to their current address on file with the Institute.



Honors Diploma

An Honors Diploma is awarded to a graduating student whose average marks for all courses that constitute an approved second year program of studies is 80% or greater.

Students who have been granted course credit exemption or advanced standing for second year courses while in attendance at BCIT, will not be eligible for Honors Diploma status, unless approved courses are added to maintain 100% workload. The Office of the Registrar must be notified by the Department Head of approved substitute courses.

Double Diploma

After receiving a Diploma of Technology in any field of study from BCIT, a graduate may earn a second diploma in another area of study upon the successful completion of one full year or its equivalent. Each program will be developed in consultation with the student's department head, giving special recognition to the student's individual needs. Each program leading to a Double Diploma must be approved by the Technology Department Head and the Registrar. Application forms may be obtained from the Office of the Registrar.

Replacement Diploma

Only one diploma will be issued to each student. Should a student request a copy because of loss, a form must be completed and returned to the Office of the Registrar. Upon review of the reason for the loss, the Registrar **may** issue a replacement diploma. There is a \$10 charge for issuing a replacement diploma.

Certificates of Technology

See Part-time Technology or Trades Admission Information.

Application for Graduation or for the Granting of a Certificate or Diploma

The following students must apply to graduate:

Students who are registered in the final level of their program must apply by the 8th week of their final term;

Students who have completed outstanding courses through Part-time Studies.

Forms for Application for Graduation or for the granting of a Certificate or Diploma may be obtained from the Student Records Office.

For further information regarding Graduation or Eligibility contact the Graduation Eligibility Assistant.

Fees and Expenses

Full-time Tuition Fees Policy for Academic Year 1987/88

Tuition expenses are reviewed annually and have been established by the Board of Governors of the British Columbia Institute of Technology and approved by the Ministry of Education for the academic year 1987/88 and are subject to change each academic year.

1. A non-refundable commitment fee of \$75.00 is due upon the applicant's acceptance into first level, including Double Diploma programs. This fee is applied toward the tuition fees and is not transferable to part-time courses.
2. An accepted applicant whose commitment fee has not been paid by the due date stated on the letter of acceptance will forfeit the seat which has been reserved.
3. An accepted applicant is required to pay the remainder of first level fees 60 days before the commencement of classes.
4. An applicant accepted less than 60 days before the commencement of classes is required to pay tuition fees upon acceptance.
5. Double Diploma Program students pay according to Two-level Programs.
6. After the commencement of classes, a student whose fees are outstanding will be excluded from classes and have his/her registration cancelled. An additional \$50.00 fee will be levied for reinstatement into classes.
7. Part-time day courses are assessed \$54.00 per credit to a maximum tuition fee of \$680.00 per level.
8. **Second Year Students** — A student returning to begin the second year (third term) of a two-year program is required to pay full term fees 30 days before the commencement of classes.

Payment made by cheques and money orders should be made payable to the BRITISH COLUMBIA INSTITUTE OF TECHNOLOGY or BCIT. Payment may also be made by VISA or MASTER-CARD. A charge of \$15.00 will be levied for costs in handling cheques returned for non-sufficient funds or other reasons. Please include your SOCIAL INSURANCE NUMBER with your payment.

International Students

Tuition fees for International Students will be based on a cost recovery formula taking into account direct and indirect costs of instruction. Except where reciprocal agreements or contracts exist, individual international students enrolled in standard programs will pay double the prevailing domestic tuition fees for that program.

Miscellaneous Fees

The following fees have been approved by the BCIT Board of Governors

Annual Fees

Tuition fees and all related policies have been reviewed for the 1987/1988 year by the British Columbia Institute of Technology Board of Governors and may be subject to change.

	1st Year	2nd & 3rd Year
General Tuition	\$1,360	\$1,360
Student Activity (annual)	77	77
Convocation (mandatory)	15	
Total	<u>\$1,437</u>	<u>\$1,452</u>

First Year Students 1987/88

All first year students must pay their fees according to the following schedule:

First Level (fall term) — due 60 days before commencement of classes

General tuition	\$ 680
(includes \$75 non refundable commitment fee) ..	
Student activity fee	44
	<u>\$ 724</u>

Second Level (winter term) — due first week of classes

General tuition	\$ 680
Student Activity	43
	<u>\$ 723</u>

Second and third year students 1987/88

All second and third year students must pay their fees according to the following schedule:

Third Level (fall term) — due 30 days before commencement of classes

General tuition	\$ 680
Student activity	44
	<u>\$ 724</u>

Fourth Level (winter term) — due first week of classes

General tuition	\$ 680
Student activity	43
Graduation fee	15
	<u>\$ 738</u>

Summer term only — The student activity fee is \$23.00 for all levels.

General Nursing

All students must pay according to the fee schedule previously stated for the School of Health Science.

Note: The only exception is Level 5.

Level 5 — due first week of classes.

General Tuition	\$ 680
Student Activity	16
	<hr/>
	\$ 696

Two-level Programs 1987/88

Health Record Technician and Double Diploma Programs

Level 1 (fall term) — due 60 days prior to the commencement of classes

General Tuition	\$ 680
(includes \$75 non-refundable commitment fee) ..	
Student Activity	44
	<hr/>
	\$ 724

Level 2 (winter term) — due first week of classes

General Tuition	\$ 680
Student Activity	43
Graduation	15
	<hr/>
	\$ 738

Electrical/Electronics Technology 1987/88

All students must pay according to the fee schedule previously stated in the Calendar of Events for the School of Engineering Technology on page .

NOTE: The only exceptions are: Co-op Program Level 4 and Level 5.

Co-op Program — due first week of classes.

General Tuition	\$ 340
Student Activity	16
	<hr/>
	\$ 356

Level 4 — due first week of classes

General Tuition	\$ 680
Student Activity	43
	<hr/>
	\$ 723

Level 5 — due first week of classes

General Tuition	\$ 680
Student Activity	43
Graduation Fee (mandatory)	15
	<hr/>
	\$ 738

Effective January 1, 1987

NSF Cheques	\$15.00
Transcript of Marks	\$ 4.00 for first copy and \$1.00 for each additional copy
Duplicate Diploma/Certificate	\$10.00 per copy
Reassessment or Appeal of Exam	\$25.00 per subject
Duplicate Tax Receipts	\$10.00
Duplicate T2202A	\$10.00
Duplicate ID card	\$ 5.00

Effective 1987/88 Academic Year

Graduation Fee	\$15.00
Challenge Exam Fee	\$75.00
Reinstatement Fee	\$50.00

Withdrawal and Refund Procedure

— subject to change for 1987/88

How to Withdraw

Students who wish to withdraw officially from BCIT must commence the process by first reporting to Student Services.

Students who are asked to withdraw from a course for reasons of discipline or unsatisfactory progress may forfeit any right to a refund under this section.

Refund Policy

Refunds of fees for all full-time and part-time day students who withdraw up to 14 days after the commencement of classes:

General Tuition: Complete refund, less \$75.
Student Activity: Complete refund.

Refunds of fees for students who withdraw 14 days after the commencement of classes:

General Tuition: No refund.
Student Activity: Appropriate student activity fee refunds will be issued by the Institute up to the last day of withdrawal refund.

After the last day of February, any student activity fee refunds must be claimed in writing from the BCIT Student Association Office and the student's ID card(s) turned in on receipt of the refund. Withdrawal verification will be made by the BCIT Student Association before processing the claim.

School of Computing and Electro-Mechanical Studies

Office of the Dean

Ron Sterne, B.A.Sc., M.A.Sc., P.Eng., F.I.M.A., Dean
Loraleigh Smith, Administrative Assistant/Executive Secretary to the Dean

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CAD/CAM Technology

It is now a widely recognized fact that Canadian industrial and engineering practices are being radically transformed by the introduction of automation into the workplace. A variety of acronyms — CAD, CADD, CAE, CAM, and CIM — have been coined to denote that this shift is different in kind from the normal evolutionary "fine tuning" of traditional processes. The CAD/CAM program — Computer Aided Design, Computer Assisted Manufacturing — explores the effects of this transition and develops a sophisticated end user of this complex technology.

CAD/CAM has important applications in the production, supervision, distribution and storage of computerized drawings. CAD/CAM design tools are used in the development of machines, tools, buildings, structures and maps. Associated non-graphic information can be stored and retrieved affecting a wide range of corporate data bases. This challenging technology offers exciting opportunities for the experienced technologist.

Job Opportunities

CAD/CAM Technologists will work in disciplines as diverse as surveying, civil and structural, mining and forestry, architectural practices, manufacturing industries and software development. Students have started their own consulting and service companies. Oil companies, municipalities, government agencies and manufacturing companies are actively implementing or examining CAD/CAM. Finally, opportunities exist in technical sales and training.

The Program

Two streams are currently available to students. Graduated engineering technologists and engineers are offered the opportunity of upgrading their current skill set through a direct entry program. This program offers intense one year training in CAD/CAM. Regular students are offered a two year program with a first year emphasizing traditional engineering discipline training.

Students will have completed a curriculum of studies in Math, Technical Communications, Drafting, Computer Science, Programming Languages and applications. The second year emphasis is placed on the use of graphics terminals with projects from the student's field of interest. Many software packages will be sampled. Data Base concepts and applications, systems management, and acquisition studies are addressed.

It is anticipated that this program will be accredited by the Society of Engineering Technologists.

Prerequisites

For first year applicants: Algebra 12, Physics 11.

For second year, direct entry applicants: a Diploma of Technology equivalent to BCIT or better, Departmental approval and CDCM 201 (or equivalent).

Applicants should have good communication and engineering skills, ability to reason in a logical manner and good disposition towards team work.

Faculty and Staff

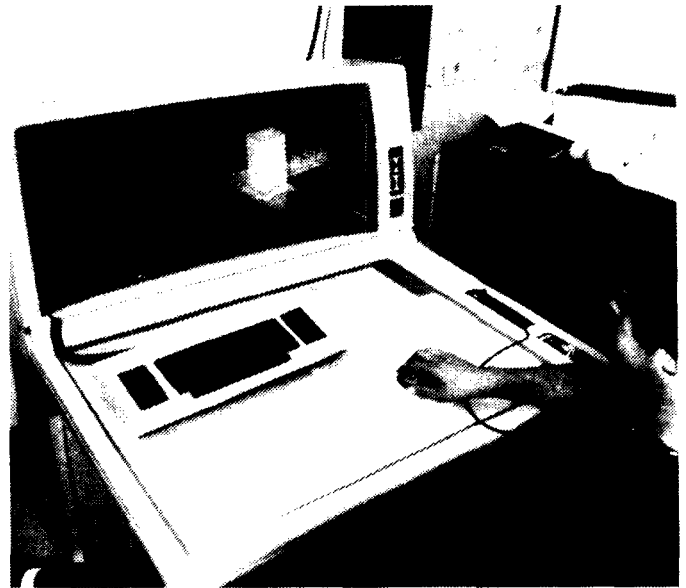
S.C. Todd, M.I. Mech. E., C. Eng., F.I.E.D., P. Eng., Department Head

C. Goodbrand, B.A. (Comp.Sci.), Program Head

G. Johnson, B.A. (Geog.)

J. Read, Dipl.T.

G. Dryer, Dipl.T.



TECHNOLOGY: CAD/CAM

Course of Studies

		Cirm hrs/wk	Credit
Level 1			
CDCM 101	Computer Sciences 1	3.0	3.0
CHSC 105	Engineering Materials.....	4.0	4.0
MATH 149	Basic Technical Mathematics for Mechanical	5.0	5.0
MECH 100	Mechanical Drafting 1	3.0	
MECH 104	Statics.....	4.0	4.0
MECH 106	Manufacturing Processes 1	4.0	4.0
MECH 107	Thermal Processes	3.0	
TCOM 109	Technical Communication.....	4.0	4.0
	Library, Research and Field Trips	5.0	
		35.0	30.0
Level 2			
CDCM 201	Cadraft 1	4.0	6.0
ELEC 209	Electrical Principles and Applications	4.0	6.0
MATH 249	Calculus for Mechanical.....	4.0	6.0
MECH 200	Mechanical Drafting 2	3.0	4.0
MECH 205	Dynamics (Term 2A).....	4.0	3.0
MECH 206	Mechanics of Materials.....	4.0	6.0
MECH 209	Manufacturing Processes 2	4.0	6.0
OPMT 145	Engineering Economy (Term 2B)	4.0	3.0
TCOM 210	Technical Communication.....	4.0	6.0
	Library, Research and Field Trips	4.0	
		39.0	46.0
Level 3			
CDCM 301	Cadraft 2	9.0	9.0
CDCM 302	Computer Science 2	6.0	6.0
ELEC 470	Robotics and CNC Languages ...	6.0	6.0
MATH 349	Numerical Methods for Mechanical	4.0	4.0
MECH 301	Machine Design 1.....	4.0	4.0
MECH 320	Fluid Power 1.....	3.0	3.0
	Library, Research and Field Trips	3.0	
		35.0	32.0
Level 4			
CDCM 303	CAM	4.0	6.0
CDCM 400	CAD/CAM Projects	10.0	14.5
CDCM 401	CAD/CAM Management	4.0	6.0

		Crm hrs/wk
CDCM 404 CAD Design	3.0	4.5
CDCM 406 Computer Systems	4.0	6.0
MATH 460 Mathematics for CAD/CAM.....	4.0	6.0
Library, Research and Field Trips	6.0	
	35.0	43.0

Course Descriptions

CDCM 101 Computer Science 1 — Introduction to Computer Science and programming using BASIC. Emphasis will be on structured problem solving. Applications drawn from the engineering disciplines.

CDCM 201 Cadraft 1 — Rudiments of Computer Aided Drafting. Machines Log-on procedures, 2D Orthographic drafting, dimensioning, annotations, assemblies and creating user interfaces.

CDCM 301 Cadraft 2 — A continuation of Cadraft 1. Elementary 3D modelling, auxiliary, isometric and perspective projections. Surfaces, surface of projection, surface of revolution.

CDCM 302 Computer Science 2 — Introduction to FORTRAN programming. Emphasis will be on structured problem solving. Applications are drawn from CAD system development: transformations, windowing, scan line conversion, etc.

CDCM 303 CAM — Introduction to Computer Numerical Control (CNC) as an integrated design tool. Creation of Graphic model, tool and machine definition, tool path creation, post processors (APT, COMPAC II), tape interfaces and direct machine linkages.

CDCM 400 CAD/CAM Projects — A collection of projects with applications to the student's field of interest. Extensive independent study and project research are emphasized. Research covers existing software packages, package modification package creation integrating graphics and data base.

CDCM 401 CAD/CAM Management — System management techniques for a modest CAD/CAM shop. Requirements analysis, evaluations and acquisition of CAD/CAM equipment. Disciplined acquisition studies.

CDCM 404 CAD Design — Modelling of complex surfaces. Surfaces of projection, revolution. Bezier surfaces, ruled surfaces, tab surfaces, etc.

CDCM 406 Computer Systems — An introduction to integrated graphics programming environments. Emphasis will be on file systems (sequential, direct, keyed) and data base systems (hierarchical, network, relational). Projects will be drawn from engineering applications.

CHSC 105 Engineering Materials — Comparative properties of all classes of engineering materials including metals, alloys, polymers, concrete, wood and ceramics. Common causes of failure in service including fatigue, weathering, embrittlement and corrosion.

ELEC 209 Electrical Principles and Applications — Power, resistance, capacitance, inductance, circuit theory and load analysis. Concepts of integrated circuits, component identification and application. AC and DC drives, stepping motors, encoders, resolvers and induction scales.

ELEC 470 CNC and Robotic Languages — Introduces the student to current CNC and Robot languages such as APT and VAL. Investigates the integrated manufacturing centre. Prerequisite: CDCM 311 and MECH 130 or CDCM 303.

MATH 149 Basic Technical Mathematics for Mechanical — Introduction to differential and integral calculus of polynomial functions including appropriate support topics from algebra, analytical geometry, plane geometry, solid geometry, trigonometry and the theory of logarithms and exponential functions. There will be a strong emphasis on applications to the physical sciences and mechanical engineering.

MATH 249 Calculus for Mechanical — An introduction to the differential and integral calculus of trigonometric, logarithmic and exponential functions and their application, maxima and minima, areas and volumes, centroids and moments of inertia, calculation of work, bending beams, functions of several variables and partial derivatives, and elementary first order differential equations.

MATH 349 Numerical Methods for Mechanical — Numerical integration, solution of algebraic and transcendental equations by iterative methods, numerical solution of differential equations and numerical differentiation. Matrix approach to 2-D and 3-D transformations with application to computer graphics. Gauss-Hordan method applied to the solution of systems of linear equations. Linear programming using the simplex method and the transportation problem.

MATH 460 Mathematics for CAD/CAM — Geometric modelling including cubic splines, bezier curves and surface patches. Matrix approach to transformations. Faster algorithms and techniques including curve generation, halftoning and other special effects. Kinematics and simulation. Solid modelling. Overview of finite element method. Selected algorithms from cartography. Interactive computer graphics concerns.

MECH 100 Mechanical Drafting 1 — Techniques of producing and reading mechanical drawings using standard format and the development of basic skills in applying these techniques. Use of instruments, line work, lettering, geometric construction isometrics, with emphasis placed on orthographic projection, auxiliary views, sections, dimensions and working drawings.

MECH 104 Statics — Vectors, force systems, concurrent and coplanar, nonconcurrent and coplanar. Graphical representation and solutions. Ideas of equilibrium. Mathematical representation of equilibrium. Analysis of frames. Statically determined structures. Redundancies. Beams, principles of moments and centroids. Second moment of area.

MECH 106 Manufacturing Processes 1 — A basic orientation course which provides the student with practice in metal removal, and a study of related theory.

MECH 107 Thermal Processes — Introduction to heat and fluid processes, steam tables, first law of thermodynamics. Basic steam power and refrigeration cycles.

MECH 200 Mechanical Drafting 2 — Advanced techniques including limits and fits, isometric and orthographic single line piping diagrams, descriptive geometry, intersections, development, gears, threads and fasteners, weld symbols and working drawings and projects.

MECH 205 Dynamics — Kinematics: basic equation of motion, motion diagrams, trajectories. Kinetics: Newton's Laws, inertia, rectilinear and rotational kinetics, systems of bodies. Work, energy, power, efficiency.

MECH 206 Mechanics of Materials — Stress, strain and deflection. Tension, compression, shear, torsion, deflection and buckling of material under load. Beams, columns, shafts, thin- and thick-walled cylinders, riveted and welded joints.

MECH 209 Manufacturing Processes 2 — Detailed knowledge of basic machine tools, evaluation of design and production features. Organized processing, break even points, equal cost quantities, estimating production costs, machine tool specification, installation and maintenance systems.

MECH 301 Machine Design 1 — Covers the theory in prerequisite courses plus combined stresses with emphasis on solution by Mohr's circle; theories of failure; stress concentration; fatigue phenomenon; welded connections; bolted and riveted connections; spur; helical and worm gear drives; speed reducers; belt and roller chain drives; flexible couplings; shafts; antifriction and journal bearing; brakes and clutches; power screws; helical and leaf springs; an introduction to mechanical vibrations with emphasis on the critical speeds of rotating assemblies. Continued in MECH 401.

MECH 320 Fluid Power 1 — Provides an understanding of pneumatic control systems. Fluid power components, their symbols, function and construction are examined and used in the design, construction and testing of simple and sequential control systems. Sizing calculations for system components are covered.

OPMT 145 Engineering Economy — Emphasizes the importance of making sound economic decisions when faced with alternative methods of solving technical problems. The course material provides the basic skills and concepts required to analyze comparative costs and to understand the time value of money (interest), inflation, depreciation, running costs, salvage value and tax considerations.

TCOM 109 Technical Communication — In this course, students learn the basic skills to become effective writers and speakers in the mechanical industry. They learn the layout, content and graphic skills of technical writing, and research and employment application techniques. They write technical memos, letters and descriptions, and give an oral report.

TCOM 210 Technical Communication — In this course, students practice the reporting techniques used in the engineering mechanical industries. They write feasibility reports, proposals, memos, letters, comparison and progress reports and a formal technical report. They also present an oral technical report. Prerequisite: TCOM 109.

AIC Spatial Information Systems Technology

One Year Post-Diploma Program

It is now a widely recognized fact that Canadian industrial and engineering practices are being radically transformed by the introduction of automation into the workplace. One of the major areas of automation has been the creation and maintenance of earth models. With the computer, our traditional flat deformed representations of the earth are being transformed into fully informative models with many applications. The development of Spatial Information Systems has been accelerated by advances in computer hardware, software and space technology.

The objectives of this one year post-diploma program are to upgrade the skills of those students who already have a relevant National Diploma and/or equivalent experience; to provide graduate technologists with the tools to perform advanced computerized analysis specific to their vocations; to develop competence in the use of micro/mini and mainframe computers; to develop competence in networking of systems; to provide students with sufficient mathematical skills to solve modelling and simulation problems; to introduce students to practical aspects of remotely sensed data processing; and to provide students with sufficient digital information system expertise to solve practical problems in their disciplines.

SIS have important applications in the production, supervision, distribution and storage of computerized maps. SIS tools include the processing of remotely sensed data used in the development of source manuscripts. Associated non-graphic information can be stored and retrieved affecting a wide range of corporate data bases. SIS also includes the production of local digital terrain, subterrain and submarine models of earth features. These models have extensive applications in the resource industries. It is to be noted that interesting applications of this technology exist outside of the earth based sciences, particularly in medicine.

This challenging program offers exciting opportunities for the technologist already trained in an earth based science.

Job Opportunities

Since SIS graduates will already have completed a curriculum of study at the National Diploma level or higher, in a traditional engineering discipline, they will make ideal "facilitators" for the new technology. They will be able to assist moderate sized engineering firms to select CAM technology and position it successfully within the corporate structure. In addition, graduates should be able to direct training programs, provide system management services, develop new software applications and use the system as a drafting and design tool.

The Program

Graduated engineering technologists and engineers are offered the opportunity of upgrading their current skill-set through a one year post-diploma level program. The program offers intense one year training in computing.

The emphasis is placed on the practical use of graphics systems for the solution of mapping problems, use of the graphics system as a design tool, and projects in SIS selected from the student's field of interest. Several software packages will be sampled. Data Base concepts and applications, systems management, and acquisition studies are addressed.

Prerequisite

Applicants must have attained a Diploma of Technology equivalent to BCIT or better, or Departmental approval.

Applicants should have good communication and engineering skills, ability to reason in a logical manner and a good disposition towards team work.

TECHNOLOGY: Applied Industrial Computing

Level 1		Cirm hrs/wk	Credit
AICO 501	Applications Programming.....	6.0	6.0
AICO 502	Principles of Process and Flow Analysis.....	4.0	4.0
AICO 503	CAD and Graphics.....	7.0	7.0
AICO 504	Microcomputer Fundamentals	6.0	6.0
AICO 507	Linear Algebra, Modelling and Simulation.....	7.0	7.0
	Library, Research and Field Trips	5.0	0.0
		35.0	30.0
Level 2			
AICO 601	File Handling and Data Base	6.0	9.0
AICO 602	Systems Management.....	3.0	4.0
AICO 603	Systems Acquisitions	3.0	4.0
AICO 605	Issues in Networking	3.0	5.0
AICO 607	Systems Projects.....	10.0	15.0
AICO 608	Digital Image Processing.....	5.0	8.0
	Library, Research and Field Trips	5.0	0.0
		35.0	45.0

Course Descriptions

AICO 501 Applications Programming — Principle of engineering computation. Stresses problems drawn from diverse engineering disciplines and graphics. Structured programming and analysis techniques using FORTRAN 77.

AICO 502 Principles of Process and Flow Analysis — Analysis and documentation of processes and complex flow problems. Structured decomposition. Analyzing current organizations, isolating areas of change, predicting impact of change. Problems to be drawn from mining, forestry and manufacturing disciplines.

AICO 503 CAD and Graphics — Rudiments of Computer Aided Drafting. Machine logon procedures, 2-D orthographic drafting, dimensioning, annotations, assemblies and creating user interfaces.

AICO 504 Microcomputer Fundamentals — Introduction to the use of microcomputers. Use of higher level programming languages (C or Pascal) in a microcomputer environment. Introduction to data structure. Microcomputer peripherals. Use of micros in an engineering environment.

AICO 507 Linear Algebra with Computer Applications — Stresses techniques required for modelling and simulation. Transformations and projections. Practical applications implemented on computers. Discrete and stochastic models. Modelling packaged software versus modelling program. Practical examples from the mining, petroleum, pulp and paper and manufacturing environments. Projects will be completed in higher level languages and/or a variety of simulation packages.

AICO 601 File Handling and Data Base Systems — Sequential, Direct and Keyed Indexed file handling. Introduction to data base systems: hierarchical, network and relational. Stress on micro based systems and engineering applications. Inventory control, BOM, etc. Discussion of DB and its impact in an integrated DP environment.

AICO 602 Systems Management — Issues related to the management of computer systems. Backup strategies, security issues. System utilization measures, system accounting. Vendor liaison, preventative maintenance scheduling. Stress on micro and minicomputer support.

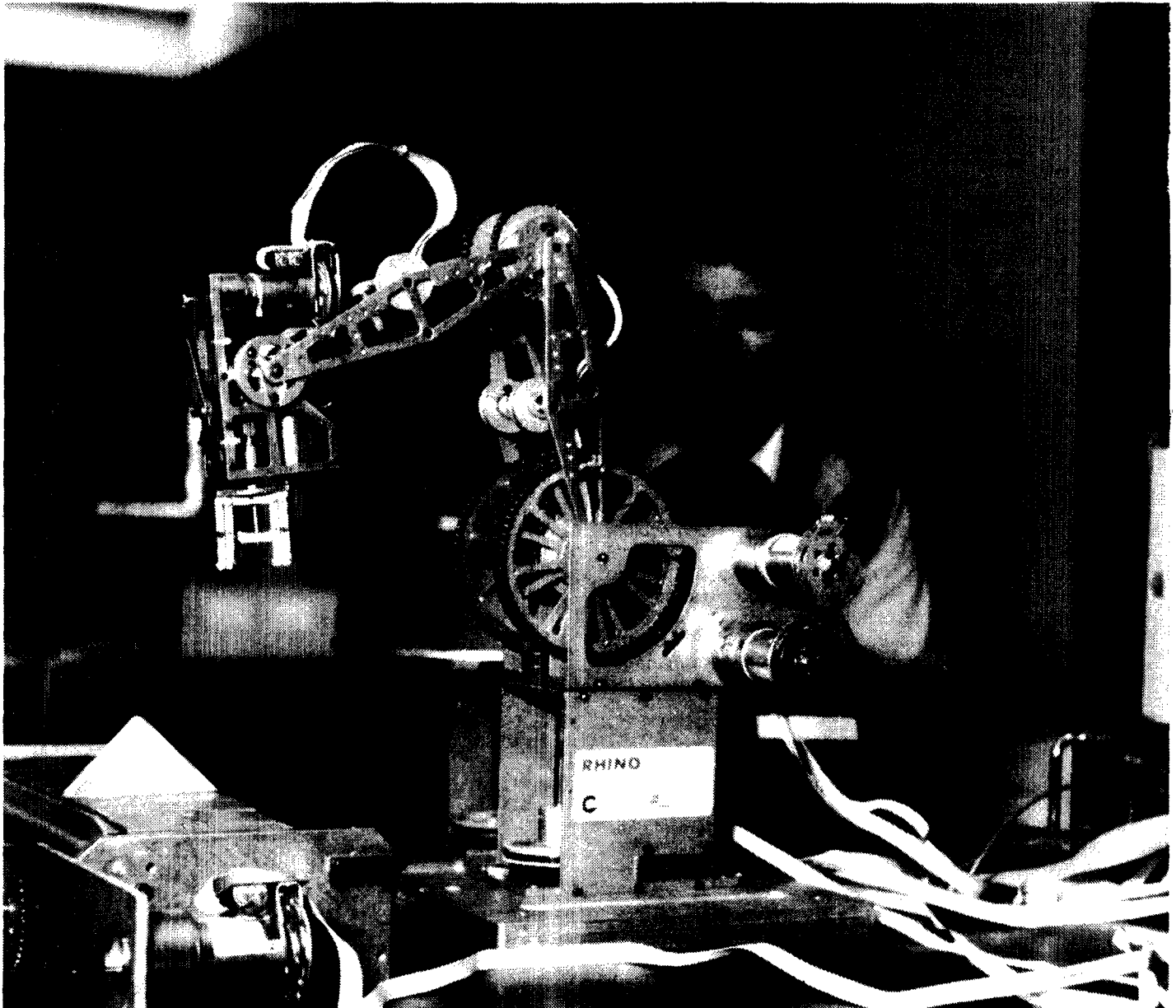
AICO 603 Systems Acquisitions — Documentation and

research required for the acquisition of automating equipment. Cost/benefit analysis. Analysis of organizational issues. Identifying scope of automation. Impact of implementation on existing structures.

AICO 605 Issues in Networking — Communication between computers. Networking theory and practice. Distributed processing using microcomputers. Issues involved and discussions and practice of user implications.

AICO 607 Systems Projects — Students working in small groups will propose and develop projects relevant to their disciplines. Groups will be interdisciplinary and will act under the guidance of selected faculty and/or industrial experts. Presentations, documentation and development will be to industry standards.

AICO 608 Digital Image Processing — Digital image processing systems. Subjective image processing techniques. Quantitative image processing techniques. Image display. Image processing software design concepts. Image data base management. Testing and administrative issues.



Advanced Manufacturing Technology

One Year Post-Diploma Program

It is now a widely recognized fact that Canadian industrial and engineering practices are being radically transformed by the introduction of automation into the workplace. Nowhere is this transformation in greater evidence than the area of manufacturing techniques. A variety of tools — CAD (Computer Aided Design), CAM (Computer Aided Manufacturing), CIM (Computer Integrated Manufacturing) — are available to the manufacturing technologist which, if properly exploited, lead to productivity increases.

The objectives of this one year post-diploma program are to upgrade the skills of those students already in possession of a relevant National Diploma and/or equivalent experience; to develop competence in the use of manual parts programming; to develop competence in the use of NC/CNC (Numerical Control/Computerized Numerical Control) techniques; to develop competence in at least one higher level parts programming language; and to familiarize the student with emerging technological advances in CIM.

This challenging program offers exciting opportunities for the technologist already trained in a relevant engineering discipline.

Job Opportunities

Since graduates will already have completed a curriculum of study at the National diploma level or higher, in a traditional engineering discipline, they will make ideal facilitators of the new technology. They will be able to assist moderate sized engineering firms to select CAM technology and position it successfully within the existing corporate structure. In addition, the graduate should be able to direct training programs, provide system consultation services, develop new parts programs and use CAD as a drafting and design tool.

The Program

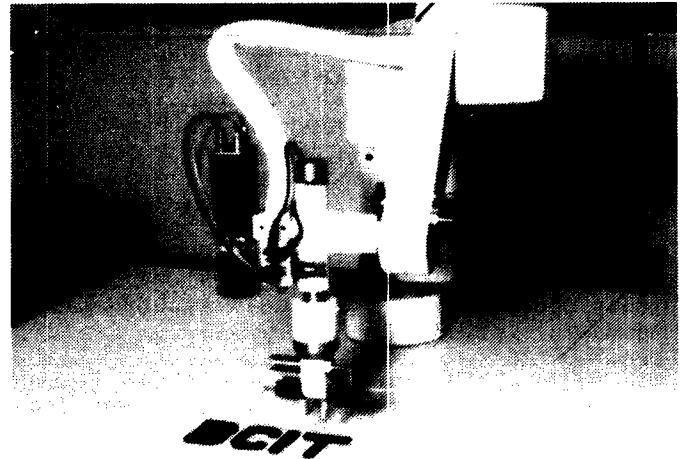
Graduated engineering technologists and engineers are offered the opportunity of upgrading their current skill set through a one year post-diploma level program. The program offers intense one year training in Computer Aided Manufacturing.

The emphasis is placed on the practical use of computer systems for the solution of manufacturing production problems. Projects will be selected from the student's field of interest. Several software packages will be sampled.

Prerequisite

Applicants must have attained a Diploma of Technology equivalent to BCIT or better, or Departmental approval.

Applicants should have good communication and engineering skills, ability to reason in a logical manner and good disposition towards team work.



TECHNOLOGY: Advanced Manufacturing

		Clim hrs/wk	Credit
Level 1			
AICO 501	Applications Programming.....	6.0	6.0
AICO 508	CNC Programming 1	5.0	5.0
AICO 509	CNC Machining Lab 1	8.0	8.0
AICO 510	3D Graphics and Design	7.0	7.0
AICO 511	Metrology.....	4.0	4.0
	Library, Research and Field Trips	5.0	
		35.0	30.0
Level 2			
AICO 611	Advanced Manufacturing Techniques.....	4.0	6.0
AICO 612	CNC Programming 2	6.0	9.0
AICO 613	CNC Machining Lab 2	6.0	9.0
AICO 614	Interactive Graphics NC Programming.....	4.0	6.0
AICO 615	Robot Applications.....	4.0	6.0
AICO 616	Computer Integrated Manufacturing.....	3.0	4.5
AICO 617	Tool Design	3.0	4.5
	Library, Research and Field Trips	5.0	
		35.0	45.0

Course Descriptions

AICO 501 Applications Programming — Principles of engineering computation. Stresses problems drawn from diverse engineering disciplines and graphics. Structured programming and analysis techniques using FORTRAN 77.

AICO 508 CNC Programming 1 — Writing programming codes necessary for CNC machine operation; programming using micro and mini based software; introduction to higher level programming languages; COMPACT II and FAPT systems.

AICO 509 CNC Machining Lab — Review of conventional machining tools; setup and operation of CNC machines; testing of progress in programs generated by CNC.

AICO 510 3D Graphics and Design — An introduction to 3D graphics systems; generation of 3D wireframe models; generation of 3D surface models with emphasis on mechanical parts generation.

AICO 511 Metrology — The use of precision measuring instruments for inspection and in process gauging; inspection techniques; optical measuring techniques; electronic gauging machines.

AICO 611 Advanced Manufacturing Techniques — Investigation of techniques in laser cutting, laser welding, water jet cutting, EDM and chemical milling.

AICO 612 CNC Programming 2 — Advanced techniques in higher level language parts programming. Developing proficiency in APT and COMPACT II.

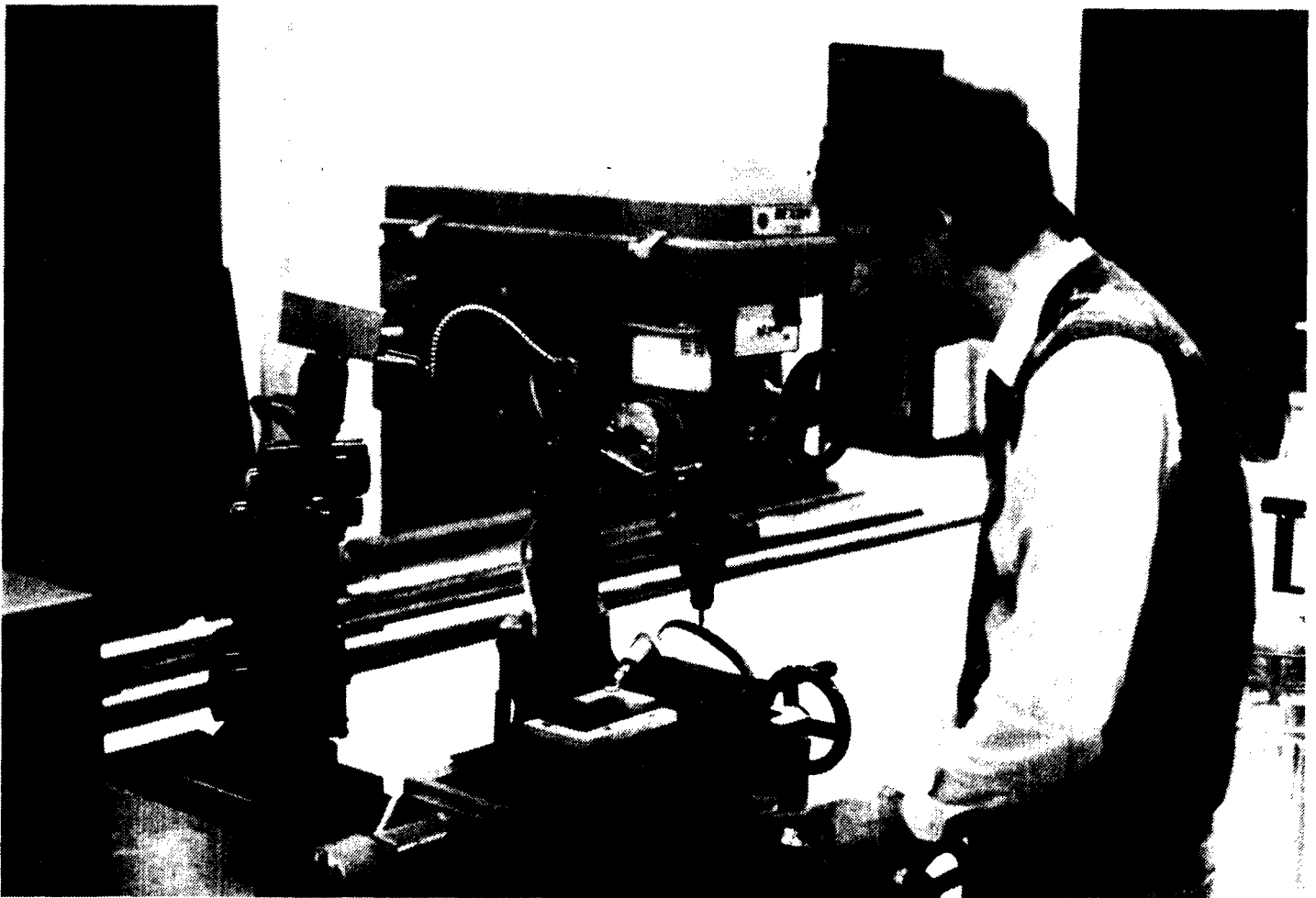
AICO 613 CNC Machining Lab — Complementary lab to CNC programming. Setup of machines for multi-axis machining. Lathes and mills.

AICO 614 Interactive Graphics NC Programming — 3D modelling of components; data base machine definition; data base tool definition; tool path generation; post processors and tape preparation.

AICO 615 Robot Applications — Introduction to robot theory; use and application of robots in a manufacturing environment; pick and place robots, painting systems; welding units; introduction to work cell creation.

AICO 616 Computer Integrated Manufacturing — The study of modern methods of manufacturing control; Materials Resources Planning; Just-in-Time inventory controls; group technology and the use of the MAP communications system.

AICO 617 Tool Design — The design of efficient holding devices for automated machining and assembly.



Resource Processing Technology

One Year Post-Diploma Program

It is now a widely recognized fact that Canadian industrial and engineering practices are being radically transformed by the introduction of automation into the workplace. One of the major areas of automation has been in the means used for the processing of our natural resources.

In the past, this area of automation has been left in the hands of computer experts and automation specialists. The end users of the technology, forestry, mining and mechanical production technologists and engineers, have been hard pressed to stay current with these techniques. The program will attempt to address this problem by allowing these technologists to upgrade their existing skills with a comprehensive understanding of how computer techniques can be applied to many phases of natural resource processing.

The objective of the program is to produce facilitators of this technology who are familiar with the production issues in forestry, mining and mechanical, who are also capable of selecting and implementing computers for specific production tasks: inventory control, process control, modelling and simulation, and optimization. In complex process control environments, the graduate should be able to liaise knowledgeably with process control specialists.

This challenging program offers exciting opportunities for the technologist already trained in a production science. To be offered September, 1988.

Job Opportunities

Since students will have already completed a curriculum of study at the National Diploma level or higher, in a production engineering discipline, they will make ideal facilitators of the new technology. They will be able to assist moderate sized engineering firms to select this technology and position it successfully within the existing corporate structure. In addition, the graduate should be able to direct training programs, provide system management services and develop new software applications.

The Program

Graduated engineering technologists and engineers are offered the opportunity to upgrade their current skill set through a one year post-diploma level program. The program offers intense one year training in computing.

The emphasis is placed on the practical use of these systems for the solution of production problems, use of the computer system as a design tool, and projects in production selected from the student's field of interest. Several software packages will be sampled. Data base concepts and applications, systems management, and acquisition studies are addressed.

Prerequisites

Applicants must have attained a Diploma of Technology equivalent to BCIT or better, or Departmental approval.

Applicants should have good communication and engineering skills, ability to reason in a logical manner and good disposition towards team work.

TECHNOLOGY: Resource Processing

This program will be offered September, 1988.

		Cirm hrs/wk	Credit
Level 1			
AICO 501	Applications Programming.....	6.0	6.0
AICO 502	Principles of Process and Flow Analysis.....	4.0	4.0
AICO 504	Microcomputer Fundamentals	6.0	6.0
AICO 505	Technical Aspects of Process Control	7.0	7.0
AICO 506	Linear Algebra, Modelling and Simulation.....	7.0	7.0
	Library, Research and Field Trips	5.0	
		35.0	30.0
Level 2			
AICO 601	File Handling and Data Base	6.0	9.0
AICO 603	Systems Acquisitions	3.0	4.0
AICO 604	Real Time Systems.....	6.0	9.0
AICO 605	Issues in Networking	3.0	5.0
AICO 606	Advanced Software Systems.....	6.0	9.0
AICO 610	Systems Projects.....	6.0	9.0
	Library, Research and Field Trips	5.0	
		35.0	45.0

Course Descriptions

AICO 501 Applications Programming — Principles of engineering computation. Stresses problems drawn from diverse engineering disciplines and graphics. Structured programming and analysis techniques using FORTRAN 77.

AICO 502 Principles of Process and Flow Analysis — Analysis and documentation of processes and complex flow problems. Structured decomposition. Analyzing current organizations, isolating areas of change, predicting impact of change. Problems to be drawn from mining, forestry and manufacturing disciplines.

AICO 504 Microcomputer Fundamentals — Introduction to the use of microcomputers. Use of higher level programming languages (C or Pascal) in a microcomputer environment. Introduction to data structures. Microcomputer peripherals. Use of micros in an engineering environment.

AICO 505 Technical Aspects of Process Control — Introduction to process control. Applications of process control to petrochemical and forestry industries. Hardware and software issues involved in process control.

AICO 506 Linear Algebra with Computer Applications — Stresses techniques required for modelling and simulation. Transformations and projections. Practical applications implemented on computers. Discrete and stochastic models. Modelling packaged software versus modelling programs. Practical examples from the mining, petroleum, pulp and paper and manufacturing environments. Projects will be completed in higher level languages and/or a variety of simulation packages.

AICO 601 File Handling and Data Base Systems — Sequential, Direct and Keyed Indexed file handling. Introduction to data base systems: hierarchical, network and relational. Stress on micro based systems and engineering applications. Inventory control, BOM, etc., Discussion of DB and its impact in an integrated DP environment.

AICO 602 Systems Management — Issues related to the management of computer systems. Backup strategies, security issues. System utilization measures, system accounting. Vendor liaison, preventative maintenance scheduling. Stress on micro and minicomputer support.

AICO 603 Systems Acquisitions — Documentation and research required for the acquisition of automating equipment. Cost/benefit analysis. Analysis of organizational issues. Identifying scope of automation. Impact of implementation on existing structures.

AICO 604 Real Time System Design — Fundamentals of Real Time system development. Signal interpretation. Peripheral and sensor interfaces. Integrity checks. Audit trials.

AICO 605 Issues in Networking — Communication between computers. Networking theory and practice. Distributed processing using microcomputers. Issues involved and discussions and practice of user implications.

AICO 606 Advanced Software Systems — Point of entry systems. Integrated process control systems. Inventory control. Students will attempt the design and development of large software systems. Examples drawn from engineering and industrial systems with emphasis on integration with Management Information Systems.

AICO 610 Systems Projects — Students working in small groups will propose and develop projects relevant to their disciplines. Groups will be interdisciplinary and will act under the guidance of selected faculty/industrial experts. Presentations, documentation and development will be to industry standards.

Computer Systems Technology

The computer has made it possible to store, manipulate, retrieve and analyze vast quantities of data and information at high speed. Computers are widely used in data processing and as management tools. Common application areas are: accounting, billing, sales analysis, transaction processing (order entry, airline reservation, banking systems), forecasting and simulation, engineering and scientific data management and calculations, planning and control functions associated with many business activities. Computer types ranging from mainframe computers, minicomputers and personal computers are now commonly used in the business world. In order for the computer to do its job, someone must define the problem to be solved, design a solution, and give the computer a detailed set of instructions (called a program) to follow to solve the problem. The job functions just described are quite often combined into one job — the "Analyst/Programmer". Thus it is the human element which determines the degree of success in any computer application.

Job Opportunities

Many graduates begin their careers as Junior Programmer or Junior Analyst and after some experience move into jobs as Programmers, Systems Analysts, Programmer/Analysts or Operating Systems Programmers. Some eventually advance into management in this field. Other career opportunities exist in such areas as: software and hardware sales, technical writing, training others on computers, consulting, software development companies or technical support. Still others seek an entrepreneurial role in the computer world as independent business owners, software authors, consultants or systems and equipment suppliers.

The Program

The first year of the program is comprised of basic business courses such as accounting, economics, statistics and an intensive introduction to programming and systems, using mainframe, mini and microcomputers. In the second year, students specialize in one of the following options:

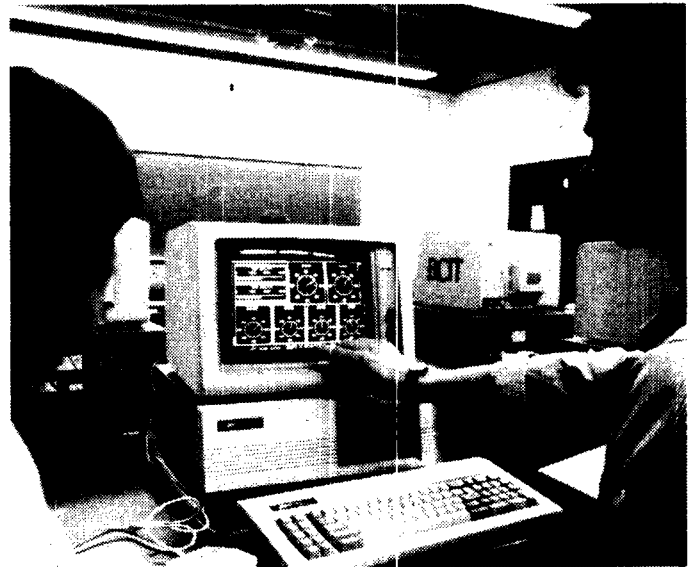
Engineering Systems — this option offers specialized courses in CAD/CAM and computer graphics, as well as traditional training in computer programming and systems analysis.

Expert Systems — this is the branch of Artificial Intelligence which develops automated systems to capture the skills of human experts. Students design and implement prototype expert systems on micro and mainframe computers. Students learn LISP, PROLOG, and a variety of expert system shell packages.

Information Systems — in addition to business systems and programming, students receive additional instruction in MIS and management skills.

Management Systems — students specialize in quantitative approaches to managerial decision making. Some of the topics covered are computer simulation, linear programming, computer graphics and the language APL.

Microcomputer Systems — Students specialize in microcomputer technology; digital logic and hardware, microcomputer systems programming, micro-based systems design and micro applications software.



Most options are limited in size to about 20 students. Where the number of applications exceeds the option size, students will be selected using a weighted average of selected first year marks.

Prerequisites 1 — First Year Entry

At least 6 grade 11 or 12 academic courses (arts and sciences), including English 12 and Algebra 11. Second year options: we specifically recommend Algebra 12 for Decision Systems and Physics 11 or 12 and Algebra 12 for Engineering Systems.

In the case of mature students, academic transcripts may be supplemented by relevant business experience, successful recent completion of relevant BCIT Part-time Studies courses with 75%, or successful recent completion of relevant courses at other post secondary institutions with 75%. Candidates may be asked to write an aptitude test to aid in the selection process.

Prerequisites 2 — Second Year Direct Entry

Qualified applicants are also accepted for direct entry into the second year of the diploma program. Successful applicants usually have a university degree or a diploma of technology from a recognized post secondary institution, or a number of courses from the BCIT Part-Time Studies Program equivalent to the first year course load, or an equivalent combination of post secondary training and work experience. Direct entry students may be required to take additional courses in order to make up deficiencies in their backgrounds. Such courses may be scheduled in consultation with the heads of the respective options.

Additional Information

All applicants should enjoy solving problems, using a logical and systematic approach. Because students spend many hours at computer terminal keyboards, applicants will find that the ability to touch type is useful.

Faculty and Staff

J.M. Wilson, B.Sc.(Hons.), M.Sc., Director
P. Abel, B.A. (Hons.), C.G.A.
R. Coolidge, Dipl. T., Co-ordinator, Service Courses
K.E. Holden, R.I.A.
H. Holst, C.D.P., C.S.P., Program Head, Information Systems Option
G.T. Kidd, B.Sc.

M.W. Lo, B.Sc.(Hons.), M.Sc., Program Head, Microcomputer Systems Option
 R.B. Long, C.G.A., Coordinator, Part-time Studies
 F.J. Martin, B.A. (Hons.), M.Sc., F.L.M.I., C.D.P., Program Head, Expert Systems Option, Head, Laboratory for Applied Research in Computer Systems
 V.A. Nagel, Dipl. T., C.D.P.
 M. Ramkay, B.Sc.
 M. Scriabin, M.B.A., Ph.D., on leave
 C.P. Simmons, C.G.A.
 K. Takagaki, B.A. (Hons.), R.I.A., C.D.P., on leave
 M.E. Turner, M.B.A., PEng., Ph.D., Program Head, Decision Systems Option
 A.Y.W. Wong, B.A.Sc., M.Eng., PEng., Program Head, Engineering Systems Option

Level 1		Cirm hrs/wk
ADMN 101	Economic Issues	3.0
BCOM 103	Business Communication for Computer Systems	3.0
COMP 150	Application Programming — ASSEMBLER	5.0
COMP 170	Systems Analysis and Design 1	4.0
COMP 172	Systems and Programming Methodology, PASCAL	4.0
FMGT 101	Accounting 1	4.0
MKTG 102	Introduction to Marketing	3.0
OPMT 113	Applied Math	4.0

Level 2		
ADMN 483	Computers and the Law	3.0
BCOM 203	Business Communication for Computer Systems	4.0
COMP 250	Application Programming — BASIC, COBOL	6.0
COMP 251	Microcomputer Systems and Applications 1	3.0
COMP 270	Systems Analysis and Design 2	5.0
FMGT 201	Accounting 2	4.0
OPMT 133	Statistics in Industry	4.0

Level 3		Info	Dec	Micro	Eng	Exp
ADMN 220	Organizational Behavior ..	3	-	-	3	-
COMP 280	Introduction to Decision Systems	3	-	3	3	3
COMP 350	Application Programming — COBOL, ASSEMBLER ..	6	6	6	-	6
COMP 351	Microcomputer Systems and Applications 2	-	-	5	-	-
COMP 352	Software Support Systems 1	3	3	3	3	3
COMP 355	CAD/CAM 1	-	-	-	4	-
COMP 356	Applications Programming — FORTRAN, Graphics Programming, APL	-	-	-	6	-
COMP 357	LISP and Expert Systems ..	-	-	-	-	5
COMP 370	Technical Aspects of Systems Design	4	4	4	4	4
COMP 381	Decision Systems 1	-	8	-	-	-
COMP 392	Computer Projects 1	5	5	5	5	5
FMGT 102	Introduction to Financial Accounting	-	-	-	3	-
FMGT 305	Cost Accounting	4	4	4	-	4
OPMT 168	Management Engineering 1	3	-	-	-	-
		31	30	30	31	30

Level 4		Info	Dec	Micro	Eng	Exp
ADMN 111	Management Fundamentals ...	3	3	3	3*	3
COMP 251	Microcomputer Systems and Applications 1	-	-	-	3	-
COMP 450	Applications Programming — PL/1, CICS, 4th Generation Languages	6	6	6	6	6
COMP 451	Microcomputer Systems and Applications 3	-	-	8	-	-
COMP 452	Software Support Systems 2	3	3	3	3	3
COMP 453	Selected MIS topics	4	-	-	-	-
COMP 455	CAD/CAM 2	-	-	-	4	-
COMP 457	PROLOG and Expert Systems	-	-	-	-	8
COMP 470	Advanced Systems Analysis and Design	4	4	4	4	4
COMP 481	Decision Systems 2	-	8	-	-	-
COMP 492	Computer Projects 2	5	5	5	5	5
NGAS 403	Process Dynamics	-	-	-	3	-
OPMT 268	Management Engineering 2	4	-	-	-	-
		29	29	29	28	29

*Engineering Systems students take ADMN 111 if they have previously taken COMP 251.

Course Descriptions

ADMN 101 Economic Issues — Exposes students to the application of various economic principles to the study of particular problems. Topics vary depending upon the instructor and the technology receiving the courses.

ADMN 111 Management Fundamentals — An insight into the basic nature of business problems and the administrative process involved in handling them, with emphasis on the personnel management function. Study and discussion is undertaken of actual business situations illustrating problems frequently met in industry requiring managerial analysis, decision and action.

ADMN 220 Organizational Behavior — The study of factors that either influence or are influenced by people at work. The course will focus on macro factors such as organizational structure, technology and environment; group factors such as conflict and decision making; and micro or individual factors such as attitudes, perception and motivation.

ADMN 483 Computers and the Law — Acquaints students with the legal system of Canada and British Columbia, with an emphasis on understanding how to deal with the kinds of legal problems that one is likely to encounter in the computer field.

BCOM 103 — Business Communication for Computer Systems — Teaches basic communication theory and the principles of effective business writing. Practice is given in writing informational and persuasive memos and letters. Students also make an informative oral presentation and complete a job application unit. Assignments are specific to the computer field.

BCOM 203 Business Communication for Computer Systems — Continues the studies begun in BCOM 103. Students write a variety of informational analytical reports. They make persuasive oral presentations and learn how to interview for information. Assignments are specific to the computer field. Prerequisite: BCOM 103.

COMP 150 Application Programming — ASSEMBLER — An introduction to the principles of programming using IBM

ASSEMBLER language. Emphasis is on understanding the mode of operation of a program, practice in the flow-charting, coding, debugging and documenting of simple business applications. Topics include data storage, use of registers, binary arithmetic, loading and searching tables.

COMP 170 Systems Analysis and Design 1 — An introduction to common business applications such as accounts receivable, accounts payable, and inventory. The course will focus on the analysis, design and development of a computer system. It also introduces the student to an integrated software package using microcomputers.

COMP 172 Systems and Programming Methodology — PASCAL — This course complements COMP 150 and 170 and is a prelude to all future systems and programming courses. It introduces the modern principles of programming methodologies. The philosophies (as advocated by pioneers like E. Dijkstra, N. Wirth, etc.) are used as guidelines to produce software that is understandable, well-structured and easy to maintain. **Pascal** (or **Modula-2**) will be used as the major language for illustration. The concept that **program = algorithm + data structure** is used as the basis of course development. Various popular data structures are examined and the various techniques of developing algorithms are covered. Top-down approach and the concept of modularization are emphasized.

COMP 250 Application Programming — BASIC, COBOL — BASIC is used to develop interactive programming and processing techniques. COBOL is introduced to reinforce the structured, modular programming techniques developed in COMP 150 and 172. COBOL programs are written to provide experience in solving practical business problems. Topics include subroutines, table handling, disk file updating and data validation.

COMP 251 Microcomputer Systems and Applications 1 — A study of microprocessors and microcomputer systems. Stresses the wide range of microcomputer applications as well as the differences and similarities to mini/mainframe systems. Topics include: overview of LSI and VLSI technology, microcomputer system architecture, hardware and software characteristics, application considerations. Also includes selected topics in computer fundamentals as related to microcomputers, such as machine concepts, Boolean logic, and Digital design principles. Students complete a project involving microcomputer hardware, software or related topic.

COMP 270 Systems Analysis and Design 2 — A continuation of the material covered in COMP 170, covering areas such as: systems development life cycle, getting a project started, preliminary investigation, systems requirements, fact finding techniques, data flow concepts and diagrams, data dictionaries, cost/benefit analysis, design of input/output and controls, on-line system design considerations, system testing, and implementation, hardware and software selection. Human factors and ethical issues are stressed.

COMP 280 Introduction to Decision Systems — An overview of the use of computers to assist management in short and long run decision making for planning and control. Topics include decision theory, inventory models, simulation, and linear programming, as well as the behavioral aspects of implementation of computer models.

COMP 350 Application Programming COBOL, ASSEMBLER — Continuation of COMP 250. Completion of ASSEMBLER language programming including the linkage of separately written program sections. Completion of COBOL language. Students write several programs incorporating a variety of programming techniques.

COMP 351 Microcomputer Systems and Applications 2 — Hardware topics include digital logic, MPU and MPU support chip sets, interfacing techniques and current real life microcomputer systems and peripherals. Software topics include several MPU instruction sets, microcomputer operating systems, and common microcomputer programming languages such as PASCAL, C, Advanced BASIC, and various ASSEMBLY languages.

COMP 352 Software Support Systems 1 — This course covers technical topics in hardware and software related to operating systems and other software support systems. Topics include hardware and software architecture, operating systems, resource management (memory processor, I/O device, data, etc.) utility functions, and programming language issues.

COMP 355 CAD/CAM 1 — Lectures, demonstrations, and practical hands-on exercises are used to present topics on: CAD/CAM hardware; CADD software; 2D drawing production and management.

COMP 356 Applications Programming — FORTRAN, GRAPHICS PROGRAMMING, APL — Continuation of COMP 150/250. Upon successful completion of this course, the student will be able to design and code advanced FORTRAN programs using structured style and top down design; use subprograms; use BASIC to do graphic routines; know the fundamentals of programming in APL.

COMP 357 LISP and Expert Systems — A major goal of this course is to have students become proficient in the language LISP so they can use it as an Expert System development tool in COMP 457. Once the basic syntax and features of the language have been covered, the course will focus strongly on LISP application areas, in particular those suitable for Expert Systems work.

COMP 370 Technical Aspects of Systems Design — Topics include tape and disk storage characteristics with an indepth study of file organization methods: Sequential, Indexed, VSAM and Direct. In addition, the study of issues in the development of on-line systems with a major data base systems project.

COMP 381 Management Decision Systems 1 — The development of computer and non-computer models which assist management in decision making in an uncertain environment. Topics include decision theory, inventory models, queuing theory, simulations of discrete and continuous systems, and risk analysis. Behavioural as well as quantitative aspects are emphasized. Feasibility studies, reports and presentations are required throughout. Students develop programs in FORTRAN and C.

COMP 392 Computer Projects 1 — These courses allow students to work on projects of their choice within guidelines specified by faculty. The projects will be drawn from a variety of sources, wherever possible from industrial situations, and may require extensive contact with the business community, and will cover a large number of diverse applications. Students will ordinarily work in teams and will seek direction from a faculty member assigned as their project supervisor. Some of the projects will continue through both terms, others will end in COMP 392 and new ones start in COMP 492.

COMP 450 Application Programming — PL/I, CICS, 4th Generation Languages — Continuation of COMP 350, including the PL/I language, the chief programmer team approach and on-line programming using CICS. Students will also be briefly introduced to a number of other languages such as RPG, APL, FOCUS, etc. Considerable time will be spent on a large multi-program system which will have been designed in COMP 470.

COMP 451 Microcomputer Systems and Applications 3 — An advanced course in Microcomputer Systems. Topics covered will include Systems Software (assemblers, compilers, operating systems, editors); Applications Software (spreadsheet, data base, communications, word processing, etc.); microcomputer networks; microcomputer management and control. Students will conceive, design and implement a systems software project (e.g. language interpreter, cross assembler, communications package, etc.). The impact of microcomputer technology within organizations and its relation to traditional data processing will also be emphasized.

COMP 452 Software Support Systems 2 — see COMP 352.

COMP 453 Selected MIS Topics — An overview of current topics of interest to the Management Information Systems practitioner. Professional journals and articles are used to explore such themes as: trends and controversies in MIS; ethical issues; career paths and professionalism; and future directions for MIS. Students read, interpret and lead discussions of relevant material.

COMP 455 CAD/CAM 2 — Lectures, demonstrations, and practical hands-on exercises are used to present topics on CAD/CAM hardware, CAD filing systems, CAD software algorithms, 2D and 3D applications, practical applications of CAD/CAM, robotics and computer aided manufacturing.

COMP 457 PROLOG and Expert Systems — This course stresses Expert Systems project development techniques. Students write programs to practice the concepts taught. The language PROLOG is taught as the course progresses, and students use LISP, PROLOG, or Expert Systems shell packages to do major projects towards the end of the course.

COMP 470 Advanced Systems Analysis and Design — Structured systems analysis; relational data base concepts; design of on-line systems; data communications and networking. Includes analysis, design and specifications of a major project which will be programmed in COMP 450. Also includes a series of special computer related topics of current interest.

COMP 481 Decision Systems 2 — Systems which assist management in planning and control of projects, the allocation of scarce resources and other short and long range planning and operational decisions. As in COMP 381, behavioural as well as quantitative aspects of the systems are examined and feasibility studies, reports and presentations are required. Topics include PERT and CPM scheduling methods, linear programming theory and application with emphasis on problem formulation, sensitivity analysis and implementation of findings; non-linear, integer and dynamic programming; comparison of optimization, simulation and heuristic methods; choosing the appropriate technique. The course uses "package" programs where applicable.

COMP 492 Computer Projects 2 — see COMP 392.

FMGT 101 Accounting 1 — Permits persons with little or no accounting background to become familiar with the techniques of working through the full accounting cycle. It provides theoretical and practical training in basic accounting as preparation for FMGT 201. Topics include accounting as an information system; introduction to accounting theory; income measurement; traditional record-keeping procedures; the accounting cycle; special journals; cash; investments and receivables.

FMGT 102 Introduction to Financial Accounting — Includes a survey of the accounting process and a review of basic

accounting theory. Preparation and analysis of financial statements and the reporting of financial information to outsiders is covered in depth. Also covered is accounting for assets, liabilities and owner's equity.

FMGT 201 Accounting 2 — The follow-up to FMGT 101, topics include inventory, long-lived assets, liabilities, forms of business organizations, cash-flow and working capital analysis, manufacturing accounting, management accounting, consolidated statements, analysis of financial statements and price level changes. Prerequisite: FMGT 101.

FMGT 305 Cost Accounting — Direct costing and the contribution approach; cost-volume-profit analysis; cost analysis for managerial planning and decisions; inventory planning, control and valuation; budgeting and profit planning; standard costs; cost and price variance analysis; capital budgeting. Applications on HP 3000 will be studied during late term labs. Prerequisite: FMGT 201 or 215.

MKTG 102 Introduction to Marketing — Includes a detailed study of the basic marketing functions, marketing research, product planning, selection of trade channels, merchandising, advertising, sales promotion and salesmanship. Marketing of consumer goods as well as industrial goods will also be covered.

NGAS 403 Process Dynamics — Introduces a practical and effective 'real time' process control situations. The student is required to produce interim progress reports during the course and a final, formal technical report at the end of the course. Topics include: system dynamics, response time, control strategies, system optimization, system modelling, flow charting, transducer and control valve evaluation.

OPMT 113 Applied Math — First portion of course involves positional numbering systems, binary arithmetic and an introduction to Boolean Algebra as it relates to operation of digital computers. The second phase covers mathematics of finance including simple interest, compound interest, annuities and project evaluation methods both before and after taxes. Typical business and personal applications are illustrated.

OPMT 133 — Statistics in Industry — Fundamentals of descriptive statistics and an introduction to inferential statistics. Inferential Statistics include probability theory; sampling and sampling distributions; estimation; hypothesis testing; linear regression and correlation analysis using a computer package (SPSS).

OPMT 168 Management Engineering 1 — The use of systematic problem solving techniques to apply cost saving measures to a data processing environment. The use of terms of reference to clarify goals for system improvements. Recording and analysis techniques such as work measurement, activity sampling, flow process charting and multiple activity charting in the information processing workplace. The application of critical examination to selected work situations. Quantified evaluation of alternatives to arrive at a best solution. Tactics for implementing and maintaining the change.

OPMT 268 Management Engineering 2 — Project control through the use of arrow and precedence diagrams. Time logic to level resource use. Microprocessor software packages for project control. Financial analysis of an investment proposal to prepare a request for expenditure, risks as a decision parameter, sensitivity analysis, decision trees and Monte Carlo techniques to analyze risks. Forecasting and projections using spreadsheet software. Applications of multi-dimensional corporate modelling. Overview of robotics and the implications for computer students. Students research a topic or a company within the computer industry and make an effective oral presentation.

Electrical/Electronics Technology

Electrical energy, electronic systems, industrial automation and control, and telecommunications form the base of modern high technology. These disciplines and the related systems and equipment are essential to the factory, the industrial process, the office, the small business, the hospital and the home. Modern transportation could not function without electronic systems.

There is a need for persons trained in the principles and applications of electronic systems to take their places in the technical team. The positions held by these persons are found in design, development, production, installation, sales and maintenance. The positions may be in commercial companies, government agencies, or educational institutions. The technologist graduate of the Electronics group is the anchor of this team.

The Electrical/Electronics Technology program is accredited by the Applied Sciences Technologists and Technicians of British Columbia.

The Program

Five options are offered in the Technology; Control Electronics, Instrumentation and Process Automation, Power, Telecommunications and Microelectronics.

The first three levels of the technology program are common to all five options. Levels 4 and 5, for all five options, are practically oriented, being primarily related to the specific industrial practices.

Throughout the program, students spend a good portion of their time in laboratories and workshops carrying out practical, applied assignments.

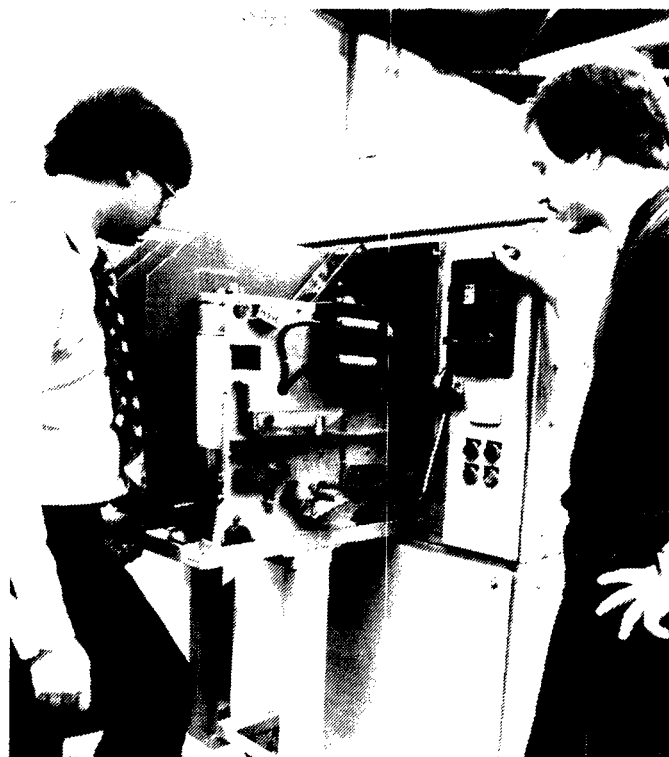
The Power Option. Students enter the option in the 5th level after having completed the 4th level of the Control Electronics option. This final term is concentrated in three areas, Utility Power Systems, Industrial Systems and Power Electronics. From the basic 3-phase power and machine theory learned in levels 3 and 4, students advance to the theory of power system analysis and protective relaying. From the industrial electronics theory learned in level 4, students advance to theory and practice of machine voltage control, speed control, motor starting and control systems and programmable controllers. Topics in industrial systems design, illumination and electrical equipment are integrated to emphasize the role engineering drawing has in these fields. The option runs in January of each year, enrolment permitting.

The Instrumentation and Process Automation Option is concerned with the application of automation and control systems to industrial processes. It is a multidisciplinary program combining analog and digital electronics, computer systems and software development, applied physics (mechanics, fluid mechanics and thermodynamics), and feedback techniques. Emphasis is placed on the application of modern measurement and control strategies to a wide range of manufacturing and processing industries. Offered January-April and September-December.

The Telecommunications Option emphasizes the application of electronics in the telecommunications industry, from simple broadcast receivers to high— density microwave radio systems. Also included are radio-navigational systems, satellite communication systems and the use of new generation computers in the telecommunications industry.



Microelectronics.



Power.

The **Control Electronics Option**, which might well be called the Computer Control Option, presents a broad-based electronics program of study designed to provide the student with the background necessary for entry into a wide variety of areas in the electronics career field. Emphasis is on digital electronics, industrial electronics and digital computers, since the techniques involved are common to all modern electronic systems.

The **Microelectronics Option** deals with the miniaturization and integration of electronic circuitry and with the application of computer tools, used in the design (CAD) and engineering (CAE) of electronic circuitry. The curriculum will include instruction in hands-on usage of CAD/CAE systems. Students will learn the uses of simulation techniques in the design of digital and analog circuitry. Basic training will be given in the layout of both hybrid and monolithic custom integrated circuits using CAD methods. Design projects, circuit assembly, and circuit testing will be carried out by students to emphasize practical applications wherever possible. Offered January-April and September-December

SEMESTER SYSTEM

The Electrical/Electronics Technology operates on a modified semester system. There are two study periods of 15 weeks each per year. Students are admitted twice each year in January and September. All levels (it takes five levels to complete the program) run concurrently. See individual option description for frequency of offering.

Co-operative Education is an integral part of the Electrical/Electronics Technology. During this portion of the program, the student is placed in an electronics related work setting in consultation with BCIT and industry, on a paid basis.

Some benefits to students are:

1. The student will receive more training in the classroom and in the workplace, a need expressed by industry due to the accelerating changes occurring in the electronics technologies.
2. There is more flexibility as to program entry and graduation.
3. Should there be a need to repeat a Level, that Level is available in each semester.
4. If a seat is not available in the September semester, the applicant can apply for the January semester.
5. Valuable experience is gained in the electronics industries, making the student instantly employable upon graduation.

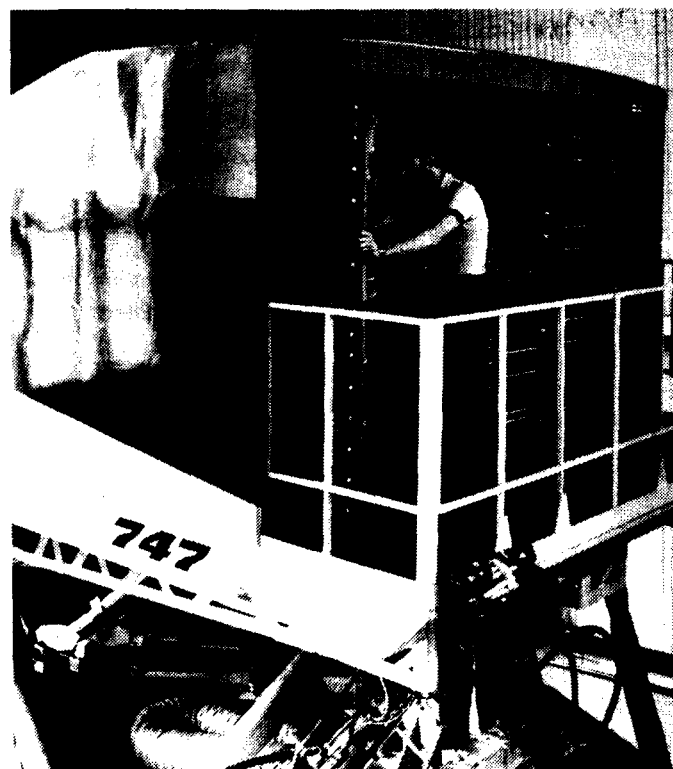
Transfer credits of the Electrical/Electronics Technology program, to British Columbia universities are possible on an individual basis.

Prerequisites

Algebra 12, Physics 11 and Chemistry 11, all with a C+ standing.



Telecommunications.



Control Electronics.

Faculty and Staff

J.H. Casimir, B.A.Sc., PEng., Department Head
 R. Bailey, Dipl.T., A.Sc.T.
 R.J. Barrett, A.Sc.T.
 R. Beketa, Dipl.T.
 U.R. Bottcher
 L.Boyle, Dipl.T., B.Sc., A.Sc.T., Program Head (Control)
 T.W. Coghlan, Dipl.T., A.Sc.T.
 N. Cousins, B.Sc., PEng.
 A. Dunlop, Dipl.T.
 P. Fenske, Dipl.T.
 D. Finlayson, Dipl.T.
 K. Gandham, B.Sc., M.Sc.
 J. Gascoyne, Dipl.T.
 T.J. Glave, B.Sc. (Eng.), PEng., Program Head (Telecommunication)
 C.F. Glazier, B.Sc. (Eng.), PEng.,
 E.G. Hancock, Dipl.T., B.Eng., PEng., Program Head (Power and Continuing Education)
 L.C. Hannah, Dipl.T.
 G.R. Harland, Dipl.T., A.Sc.T.
 J. Hayes, Dipl.T., A.Sc.T.
 M. Inch, B.Sc.
 R. Jones, PEng.
 K. Kajiwar, Dipl.T., A.Sc.T.
 E. Kenward, B.Sc.
 M. Lane, Dipl.T.
 J. Leibel
 J. McLarnon, B.Sc., M.Sc., Ph.D.
 W.F. Miklas, Dipl.T., A.Sc.T.
 A. Miller
 D. Miluch, B.Sc., PEng.
 A.R. Murdoch, B.A.Sc., PEng.
 E. Murru, B.A.Sc., PEng.
 G. Pellegrin, B.Sc., PEng.
 M.G.R. Phillips, B.Sc., Ph.D.
 R. Randall, B.Eng., M.S.
 D. Rees-Thomas, B.Sc., A.Sc.T.
 R. Riches, B.Sc., M.Sc.
 I. Ross, B.Sc. (Hons.)
 R.T. Russell
 J.W. Schoonover, Dipl.T., A.Sc.T.
 E.W. Scratchley, B.A.Sc., M.A.Sc., PEng., Program Head (Microelectronics)
 J.N. Tompkin, B.Sc. (Eng.), PEng., Chief Instructor (Levels 1 — 3)
 E.A. Upward, Dipl.T., A.Sc.T., Program Head (Instrumentation)

TECHNOLOGY: Electrical

		Clim hrs/wk
Level 1		
ELEC 100	Circuit Analysis 1.....	6.0
ELEC 101	Shop Practice.....	5.0
ELEC 102	Programming 1.....	3.0
MATH 143	Basic Technical Mathematics for Electrical.....	7.0
PHYS 106	Physics for Electrical Technology.....	6.0
TCOM 104	Technical Writing.....	3.0
Level 2		
ELEC 200	Circuit Analysis 2.....	5.0
ELEC 201	Printed Circuit Board Fabrication.....	4.0
ELEC 202	Digital Techniques 1.....	3.0
ELEC 203	Electronic Circuits 1.....	6.0

MATH 243	Calculus for Electrical.....	7.0
PHYS 206	Physics for Electrical Technology.....	5.0

Level 3

ELEC 302	Digital Techniques 2.....	5.0
ELEC 303	Electronic Circuits 2.....	5.0
ELEC 304	Telecommunications 1.....	5.0
ELEC 305	Electrical Equipment 1.....	5.0
ELEC 306	Transducer Applications.....	5.0
ELEC 307	Pulse Techniques.....	5.0

CO-OP 1

ELEC 390	Co-op 1.....	15.0
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CO-OP 2

ELEC 490	Co-op 2.....	15.0
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PROGRAM: Telecommunications

Level 4

ELEC 402	Digital Systems.....	6.0
ELEC 404	Telecommunications 2.....	6.0
ELEC 406	Data Communications.....	6.0
ELEC 408	Antennas and Transmission Lines.....	5.0
MATH 343	Transform Calculus for Electrical.....	4.0
TCOM 204	Technical Writing.....	3.0

Level 5

ELEC 415	Computer Systems.....	6.0
ELEC 416	Communications Networks.....	5.0
ELEC 417	Telecommunications 3.....	5.0
ELEC 418	Radio Frequency Circuit Design.....	6.0
ELEC 419	Microwave Principles.....	5.0
OPMT 149	Small Business Fundamentals.....	3.0

PROGRAM: Control Electronics

Level 4

ELEC 402	Digital Systems.....	6.0
ELEC 403	Industrial Electronics.....	5.0
ELEC 406	Data Communications.....	6.0
ELEC 407	Feedback.....	6.0
MATH 343	Transform Calculus for Electrical.....	4.0
TCOM 204	Technical Writing.....	3.0

Level 5

ELEC 415	Computer Systems.....	6.0
ELEC 420	Computer Control Systems.....	5.0
ELEC 421	CAD Systems.....	5.0
ELEC 423	Video Graphics.....	6.0
ELEC 434	PASCAL.....	5.0
OPMT 149	Small Business Fundamentals.....	3.0

PROGRAM: Instrumentation and Process Automation

Level 4

CHSC 341	Unit Operations for Process Control.....	4.0
ELEC 402	Digital Systems.....	6.0
ELEC 411	Electronics for Interfacing and Signal Conditioning.....	5.0
ELEC 412	Transducers for Measurement and Control.....	6.0
ELEC 413	Control Devices and Techniques.....	6.0
TCOM 204	Technical Writing.....	3.0

Level 5

CHEM 302	Industrial Analyzers.....	5.0
ELEC 420	Computer Control Systems.....	5.0

	Clrm hrs/wk
ELEC 424 Industrial Processes and Control Systems	6.0
ELEC 426 Microprocessors in Measurement and Control	6.0
ELEC 427 Transducer Systems	4.0
ELEC 428 Instrumentation Engineering Project	4.0

PROGRAM: Microelectronics

Level 4

ELEC 402 Digital Systems	6.0
ELEC 432 CAD/CAE for Microelectronics	6.0
ELEC 433 Hybrid Microelectronics	6.0
ELEC 434 PASCAL	5.0
MATH 343 Transform Calculus for Electrical	4.0
TCOM 204 Technical Writing	3.0

Level 5

ELEC 406 Data Communications	6.0
ELEC 415 Computer Systems	6.0
ELEC 436 Analog Integrated Circuit Design	5.0
ELEC 437 Principles of VLSI Design	5.0
ELEC 438 Microelectronic Applications	5.0
OPMT 149 Small Business Fundamentals	3.0

PROGRAM: Power

Level 4

ELEC 402 Digital Systems	6.0
ELEC 403 Industrial Electronics	5.0
ELEC 406 Data Communications	6.0
ELEC 407 Feedback	6.0
MATH 343 Transform Calculus for Electrical	4.0
TCOM 204 Technical Writing	3.0

Level 5

ELEC 405 Electrical Equipment and Controls	7.0
ELEC 414 Power Systems	6.0
ELEC 429 Power Electronics	6.0
ELEC 431 Industrial Systems	8.0
OPMT 149 Small Business Fundamentals	3.0

Course Descriptions

CHEM 302 Industrial Analyzers — Teaches the student the principles and applications of electronics transducers and circuitry used in the process analysis of liquids and gases. Topics include electro-chemical principles and terminology, selection of transducers, electrolytic conductivity, specific ion probes, specific ion electrodes, flame ionization detectors, chromatographs and spectrophotometers. Lab exercises consist of design, construction and calibration of transducers such as coulometric electrodes and ionization detectors as well as construction of characteristic signal linearization and amplification circuitry.

CHSC 341 Unit Operations for Process Control — First and second law of thermodynamics; enthalpy, entropy, phase rule, thermodynamic diagrams and tables; properties of steam; fluid flow and measurement in pipes and channels, piping, pipe fittings and valves; flow of heat, conduction, convection, radiation, film and overall transfer co-efficients, heat exchangers; principles and application of equipment for evaporation, distillation, absorption, extraction; humidification and dehumidification; drying; solid-liquid and liquid-liquid extraction.

ELEC 100 Circuit Analysis 1 — This course teaches the principles and methods of analysis related to DC circuits. Topics

include work, energy, voltage current, power, resistance, inductance, capacitance, impedance, SI units and terminology. Methods of analysis include loop, superposition, Nodal, Thevenin and Norton. The lab portion of the course provides practice in the use of power supplies, function generators, multimeters and components. The labs are synchronized with the lectures so that theory is studied and confirmed by application.

ELEC 101 Shop Practice — Through the design and manufacture of a specific electronic project, students learn the basic skills required in the field of electronics including basic electronic drafting, preparation of detailed drawings, sheet metal cutting and folding, soldering, selection and mounting of connectors such as phono and BNC, basic printed circuit layout and manufacture. Introduces students to the basic discrete passive components used in electronics and to the techniques of layout and fabrication of electronic equipment. Upon successful completion, the student should have a good understanding of the characteristics of components used in electronic equipment, chassis and metal cabinet design, electronic drafting conventions, preparation of detailed drawings, sheet metal cutting and folding, as well as the tools and measurement techniques used in electronic fabrication.

ELEC 102 Programming 1 — Teaches structured computer programming with the BASIC computer language. Topics include the use of a disk based operating system, input and output commands, decision making, repetitive programming structures, subroutines, string manipulations and the use of graphics on the IBM PC.

ELEC 200 Circuit Analysis 2 — Introduces the behavior of electrical circuits and networks when driven by a single-phase alternating current (AC) source; preparation for courses in electronics and power systems. The course includes the sine wave, average and effective values, power and power factor; resistance, capacitance and inductance as elements in single-phase AC circuits; phasor diagrams, impedance, admittance, voltage, current and power diagrams; analysis of AC circuits with complex algebra; resonance and resonant circuits, high and low pass filters; the application of circuit laws and theorems to single-phase AC circuits, the analysis of two-part networks; coupled circuits. The circuit theory is verified using multimeters, sine wave generators, amplifiers and dual trace oscilloscopes.

ELEC 201 Printed Circuit Board Design — The first 4 weeks of this continuation of Shop Practice, deal with printed circuit board repair and reworking. Topics and work include materials, manufacturing methods, tools used for repair, high reliability soldering, repair of heat damaged and mechanically damaged boards, boards with plated holes and multi-layer boards. The last 8 weeks cover the design and fabrication of single side printed circuit boards. Topics and work include material and equipment requirements, artwork layout from schematic, board processing (etching, drilling and component mounting).

ELEC 202 Digital Techniques 1 — Provides students with the basic concept of digital logic circuits. The course begins with an introduction to the binary (two states or levels) concept followed by a description of binary variables as related to mechanical switches and electromagnetic relays, and then moves on to circuits using electronic logic gates such as the AND/OR, Inverter, Exclusive/OR, NAND and NOR gate. Boolean algebra is introduced and the student is expected to simplify Boolean equations using Boolean identities or by using Karnaugh maps. The student will learn how to derive alternative symbols for the NAND/NOR gate using De Morgan's Theorem. Students will then be able to use the appropriate logic symbols and gating techniques correctly to analyze and construct combinational logic circuits.

ELEC 203 Electronic Circuits 1 — Explains how electronic circuits work, how to analyse them and how to design, modify and combine them to perform complex functions. Topics include interpretation of bipolar and field-effect transistor characteristic curves; voltage and current amplifying circuits; the transistor as a switch; loadline analysis; choice of Q-point; bias circuits; equivalent circuits; frequency response, feedback, oscillation response; oscillator circuits; power amplifiers of various types; heat sink calculations and characteristics and application of switching devices including the unijunction. Prerequisite: MATH 143, PHYS 106, ELEC 200 (ELEC 200 may be taken concurrently); or MATH 134, PHYS 108, ELEC 103 for Robotics.

ELEC 208 Circuit Analysis AC/DC — Applicants are required to obtain authorization from the department before enrolling in this course. This course enables persons with a strong background or education in the electrical field to cover and/or review those topics necessary to take the more advanced courses in the Electrical Program. Students study the basics of how single phase AC and DC circuits work, and how to analyze and design them for particular situations. This course is not intended for those without previous training in electrical theory or advanced math. Prerequisite: Math higher than ALG 12, PHYS 11 and CHEM 11.

ELEC 209 Electrical Principles and Applications — Power, resistance, capacitance, inductance circuit theory and load analysis. Concepts of integrated circuits, component identification and application. AC and DC drives, stepping motors, encoders, resolvers and induction motors.

ELEC 250 Electrical Systems — Students learn how to plan the electrical system for a specific building, with the electrical designer. How to read and work with common electrical drawings and specifications, understand single and three-phase systems, and power factor correction for optimum operations costs; recognize and avoid building designs that create costly electrical design problems. Prerequisite: ELEC 150.

ELEC 302 Digital Techniques 2 — Studies the utilization of logic gates using Boolean Algebra and Karnaugh maps. The TTL family specifications including noise margins, loading and propagation delays. The interfacing of various digital circuits. The encoding and decoding of numbering systems and digital arithmetic. Sequential logic, flip flops (RS, JK, D Type, Master slave) counters and shift registers. Also included are frequency counters, D/A and A/D converters and digital switching using transmission gates. Prerequisite: ELEC 202, 203, 303 and 307. (ELEC 303 and 307 may be taken concurrently.)

ELEC 303 Electronic Circuits 2 — A continuation of ELEC 203 Electronic Circuits 1. One half of the course deals with circuit applications not previously covered including DC power supplies, voltage and current regulation; small-signal tuned amplifiers, neutralising and the cascade configuration; wide band amplifiers; DC amplifiers; differential amplifiers. The remaining half of the course gives an introduction to linear integrated circuits, particularly the operational amplifier and some of its circuit applications including an introduction to active filters. Prerequisite: ELEC 200, 203, and MATH 243; or ELEC 103, ELEC 203 and MATH 234 for Robotics.

ELEC 304 Telecommunications 1 — Introduces the principles of telecommunications and defines the telecommunications system. Various techniques for modulation are explained, together with circuits to generate and demodulate them. These include amplitude modulation, single-sideband, frequency modulation and phase modulation. A typical transmitter and receiver is introduced in block form, and the various component circuits are examined in more detail. Prerequisite: ELEC 203, MATH 243 and ELEC 200 or ELEC 208.

ELEC 305 Electrical Equipment 1 — Begins as a continuation of circuit analysis then moves on to the study of motors, generators, transformers and rectifiers. Topics include a review of phasor diagrams, power factors, three phase power and circuit analysis, single and three phase power distribution systems, DC motors and generators, induction motors, Synchronous motors and generators, stepper motors, motor control circuits, transformers (single and three phase), and three phase rectification. Prerequisite: ELEC 200 or 208 and MATH 243 or 313, PHYS 206; (or ELEC 103, MATH 234 and PHYS 208 for Robotics).

ELEC 306 Transducer Applications — Introduces the student to the electrical and electronic transducers used to interface systems to the real world. Methods used to measure strain, force, position, temperature and pressure will be discussed, and the circuitry used will be described and evaluated. The application of feedback to control a process variable will also be discussed. Theory will be supported by laboratory exercises applying typical industrial equipment to measure and control the variables studied. Prerequisite: MATH 243, PHYS 206, ELEC 303.

ELEC 307 Pulse Techniques — Introduces pulse signal circuits such as clippers and clamps, transistor switches, astable and monostable multivibrators, Schmitt triggers, ramp generators, DC to DC converters and phase lock loops. Both discrete transistors (bipolar and FET) and CMOS integrated circuits are used in building all these circuits. Each circuit is analyzed in detail and its practical application is considered. Prerequisite: ELEC 200, 202, 203, MATH 243; (or ELEC 103, ELEC 202, ELEC 203 and MATH 234 for Robotics).

ELEC 390 Co-op 1

ELEC 402 Digital Systems — Applies knowledge gained in Digital Techniques 1 and 2 to study digital Mux, display Mux, tri-state, bus techniques, memory IC's and memory decoding schemes. A detailed introduction to microcomputer architecture is undertaken using the Z80 as an example. The student is also introduced to machine/assembly language programming, the CP/M operating system, as well as utilities such as an assembler, text editor, linker, software debugger, etc. Z80 timing, control, buffering, interfacing, interrupts and support chips are studied in detail using a small single board Z80 system. Prerequisite: ELEC 100, 102, 200, 202, 203, 302, 303, and 307.

ELEC 403 Industrial Electronics — Covers DC power supplies and regulators including a major session on switching regulators. DC-to-AC inverters. Triac and SCR phase control is introduced along with SCR and VMOS FET power control for DC circuits. Relay ladder logic circuits are implemented with programmable controllers. Other topics briefly covered include battery characteristics, battery chargers, and electrical hazards. Prerequisite: ELEC 303, 305 and 307.

ELEC 404 Telecommunications 2 — A continuation of ELEC 304. The first part of the course deals with complete transmitting and receiving systems with emphasis on mobile communications. Topics include: system performance; frequency synthesis and control; AGC systems; squelch and muting; noise and emphasis; tone-controlled signalling; antenna coupling systems; digital and microprocessor system control. The second part of the course deals with video systems. Topics include: the video signal for both B/W and colour transmission; the NTSC, PAL and SECAM systems; video transmitting and receiving systems; and an introduction to video recording in both VHS and Beta systems. Prerequisite: ELEC 303, ELEC 304, ELEC 402, ELEC 408 (ELEC 402 and ELEC 408 may be taken concurrently).

ELEC 405 Electrical Equipment and Controls — This course is a continuation of ELEC 305. Commencing with a review and expansion of topics on fuses and circuit breakers, the course moves on to a more detailed study of DC and AC motors and their starting equipment. From written descriptions of control circuit operation, students design control schematics to implement relay control systems. From the completed relay control schematics, power and control wiring diagrams are prepared to implement these systems. Students will be introduced to electrical protective devices such as instrument transformers, protective relays and lighting arresters. Prerequisite: ELEC 305.

ELEC 406 Data Communication — Introduces the techniques used to communicate digital data from one point to another. Topics include transmission media, channel characteristics and interface standards (RS 232C, RS 449, current loop). Techniques for modulation (FSK, PSK, PPSK, PAM) and data coding (NRZ, RZ, Manchester) are presented. Error detection and correction is covered. Other topics include band width bit rate limitations, character oriented (HDLC) and bit oriented (Bisym) protocols, as well as networking schemes. Prerequisite: ELEC 302, 303, 307 and 402 (ELEC 402 may be taken concurrently).

ELEC 407 Feedback — An introduction to linear feedback theory and practice as applied to servomechanisms — motor position and speed control — and some electronic circuits including OP-AMPS, oscillators and voltage regulators. Block diagram transfer functions are developed from d-c for steady state, through sinusoidal, and BODE frequency analysis (including Gain and Phase margins) to Laplace transformed differential equations for root locus analysis of transient response and evaluation of control system performance. Prerequisite: ELEC 303 and MATH 343 (MATH 343 may be taken concurrently).

ELEC 408 Antennas and Transmission Lines — Provides practical knowledge of the methods and devices used for the transmission of radio frequency energy. Topics include the characteristic and limitations of open-wire lines, coaxial lines and waveguides; dipole and simulated dipole antennas; loop antennas; antenna arrays and microwave antennas (horns, slotted lines, parabolic). Prerequisite: ELEC 303, ELEC 304.

ELEC 411 Electronics for Interfacing and Signal Conditioning — Examines the application and design of precision analog circuits to interface and signal conditioning systems. Topics include the specification, design and evaluation of amplifier systems commonly used in transducer interfacing applications, high accuracy and stability signal conditioning design techniques and analog signal transmission and multiplexing systems with emphasis on the 2-wire current loop. A strong practical approach is ensured by relevant lab exercises and projects. Prerequisite: ELEC 302, 303, 306.

ELEC 412 Transducers for Measurement and Control — Introduces techniques used in the industrial measurement of pressure, flow, level, density and viscosity. Various pressure transducers are discussed including manometers and differential pressure transmitters. Flow measuring elements such as orifice plates, turbine flow meters, magnetic flow meters and ultrasonic flow meters are discussed. Applications of density and viscosity to various processes are examined. Labs consist of the configuration, calibration and testing of various industrial devices. Prerequisite: PHYS 206, ELEC 306, ELEC 411. (ELEC 411 may be taken concurrently.)

ELEC 413 Control Devices and Techniques — Examines the principles and practices used in the design and application of common industrial process control components and systems. Topics include: automatic process control principles using open and closed loop systems. Basic feedback design principles used

with electronic, pneumatic and hydraulic devices used as transmitters, signal converters, positioners and power amplifiers. Control valve specification and sizing is also included. Lab exercises will consist of analyzing the design and performance of manufacturers control equipment applied to actual steam and liquid processes. Prerequisite: ELEC 306, 412. (ELEC 412 may be taken concurrently.)

ELEC 414 Power Systems — Commences with an overview of energy sources and then moves on to the circuit analysis of electrical power transmission and distribution systems. Synchronous machine, transient and subtransient reactances and how they affect symmetrical and asymmetrical fault currents will be studied in detail. Topics include hydro, thermal, nuclear, solar, wind and tidal power, synchronizing and load sharing of generators and systems, transmission and distribution line parameters, the per unit method of circuit calculation, transmission and distribution line voltage regulation and determination of available short circuit currents. Prerequisite: ELEC 305.

ELEC 415 Computer Systems — Introduces software and hardware concepts and strategies that are essential for development of computer systems. Topics include: top-down design; disk controllers and structures; direct memory access; inter CPU communication; stand alone systems; and memory management. Prerequisite: ELEC 402 and 406. (ELEC 406 may be taken concurrently.)

ELEC 416 Communication Networks — Introduces students to the present-day North American telecommunications network. Topics include evolution of telephone systems, transmission and switching; transmission mediums; frequency division multiplexing; time division multiplexing including pulse code modulation; introduction to data communications and fibre optics; switching systems including step-by-step (strowger), cross-bar-common control; electronic space and time division types; associated signalling, power and traffic considerations. Prerequisite: ELEC 402, 404, 406.

ELEC 417 Telecommunications 3 — The first part of the course introduces the modes of propagation of EM (electromagnetic) energy and the types of equipment used to establish microwave links. Topics include: ground, sky and spacewave propagation; microwave paths; environmental factors; site considerations; point-to-point communications and noise performance of communications systems. The second part of the course deals with the application of EM wave propagation for radio-navigational purposes. Radio-navigation systems discussed include: Loran-C (low-frequency propagation); RDF (medium-frequency propagation); VHF Omni-range (VHF propagation); and radar (microwave propagation). Prerequisite: ELEC 404, ELEC 408, ELEC 419 (ELEC 419 may be taken concurrently).

ELEC 418 Radio Frequency Circuit Design — Teaches how to design HF and VHF circuits. Topics include: impedance matching networks; wideband transformers; synthesis of lowpass, highpass, bandpass and bandstop Butterworth and Chebychev filters; an introduction to microstrip circuits; high frequency modelling of transistors; small-signal amplifier design using Y and S parameters; stability analysis; design of oscillators and RF power amplifiers; use of feedback in design of wideband amplifiers; mixers; and noise performance of amplifiers. Labs require students to design, build and test various circuits applying theoretical knowledge. Prerequisite: ELEC 404 and 408.

ELEC 419 Microwave Principles — An introduction to microwave principles and devices most frequently encountered in communications, radar and other industries using microwave energy. Topics include sources of microwave, attenuating devices, frequency and power measuring devices, modulators,

isolators and amplifiers. Also included is a study of high capacity microwave transceivers and analysis of satellite communication links. Prerequisite: ELEC 404, 408.

ELEC 420 Computer Control Systems — Examines the application of computer systems to the monitoring and control of industrial processes. Topics include real time operating systems, structured programming, and high-level language programming techniques. Data acquisition systems will be examined with attention to the specification of I/O systems, programmed and interrupt-driven I/O techniques, the sampling theorem, and frequency response. In the lab the student will develop routines to perform graphic displays, keyboard handling and command decoding. Data acquisition and 3-mode process control. Prerequisite: ELEC 102, 402 and 407 or 413.

ELEC 421 CAD Systems — Introduces the student to computer programs used in electronics. Electronic design programs for Digital Logic Simulation and for Printed Circuit Layout are covered, with student projects in each. A spreadsheet for costing and accounting is introduced. A computer aided design (CAD) program is used for drafting and schematic drawing. This course is mostly lab work with each student learning each program individually. Prerequisite: ELEC 102, 201 and 402.

ELEC 423 Video Graphics — Introduces practical industrial applications of video for acquisition and display of data. The fundamentals of video raster scan and vector displays are reviewed and video cameras are used in image measurement and digital image storage. Image generation on a video monitor is discussed and simple digital circuits are used to generate pictures. The light pen, image storage in RAM, alphanumeric ROM character generators and CRT controllers are all introduced in lectures and in lab projects. Assembly language programming is used with a small Z80 computer to create graphics displays. Prerequisite: ELEC 303, 307 and 402.

ELEC 424 Industrial Processes and Control Systems — This course examines the practical application of automatic control systems to industrial processes. Common industrial processes are introduced and their basic operating characteristics identified. Appropriate control strategies are discussed for a wide variety of processes, including boiler systems, energy management systems, evaporators, distillation and PH systems. These processes will be used to demonstrate the application of the most common multi-variable control strategies, including 3 mode feedback, cascade, selective, ratio, and adaptive, nonlinear and feedforward systems. Prerequisite: ELEC 412, 413, 427, CHSC 341. (ELEC 427 may be taken concurrently.)

ELEC 426 Microprocessors in Measurement and Control — Investigates the application of the microprocessor to industrial process control systems. Topics include the design of hardware and software systems to implement basic binary control functions as well as more advanced two position and PID types. This course will also include a discussion of analog controller circuits and a review of the latest commercial products. The lab portion of this course will provide practical experience in microprocessor circuit design, interfacing of analog and digital I/O and software design. Prerequisite: ELEC 402, 411, 420. (ELEC 420 may be taken concurrently.)

ELEC 427 Transducer Systems — Continuation of ELEC 412, industrial measurement techniques for temperature, humidity and dew point are examined. These include psychrometers, hygrometers and vapour equilibrium systems. SAS analysis techniques including chemical absorption, thermal conductivity, paramagnetic, heat of combustion and zirconium oxide analysers are studied. Various advanced process analysers are also included with particular emphasis on industrial applications.

Topics include process spectrometry, industrial PH measurement and SAS chromatography. Prerequisite: ELEC 411, 412 and CHEM 11.

ELEC 428 Instrumentation Engineering Project — Examines process control system design and documentation techniques. Current ISA, SAMA and ASME symbologies are used in the preparation of control system documents such as process and instrument drawings, loop drawings functional diagrams and specification sheets. The application and programming of configurable controllers is also examined. Interlock and sequence control systems are designed using ISA and JEDEC symbologies and implemented using programmable logic controllers (PLC's). Other topics such as hazardous area classification and related instrument design practices are also examined. Project work involves all aspects of control system design from concept to evaluation. Prerequisite: CHSC 341, ELEC 424, ELEC 427. (ELEC 424, 427 may be taken concurrently.)

ELEC 429 Power Electronics — A continuation of ELEC 403 Industrial Electronics this course acquaints the student with numerous industrial and utility applications which use programmable controllers, thyristors and power transistors. Topics include relay control circuits and their implementation with programmable controllers, thyristor DC motor speed controllers, static exciters, and variable frequency induction motor drives. Other topics may include chopper control of DC traction motors and single and three phase inverters. Prerequisite: ELEC 305, 403, 407.

ELEC 431 Industrial Systems — Deals with the design of electrical systems for industrial plants and commercial buildings. Topics include illumination, lighting systems, feeder calculations and ratings, motor branch feeders, motor control centres, switchboards, unit substations, demand factors, voltage levels, grounding, ground fault protection and system protection and co-ordination, together with all appropriate sections of the Canadian Electrical Code. From written descriptions of commercial building lighting and receptacle system requirements, students practice designing and drafting a wiring system acceptable to Canadian Electrical Code regulations. Prerequisite: ELEC 305.

ELEC 432 CAD/CAE for Microelectronics — Offers an introductory treatment of logic simulation techniques, schematic capture and CMOS integrated circuit layout. This laboratory-oriented course trains students in the use of current electronic CAD/CAE systems. In the first third of the course, the principles of logic simulation are covered and computer simulation exercises (IBM PC's) acquaint students with the use of TTL libraries, ROM's, ALU's and PLA's. Next, students learn to use the Mentor Graphics workstations to create schematics and simulate circuits. The final third of the course is an introduction to CMOS mask level design using interactive graphics and a descriptive language. The fundamentals of MOS operation and manufacture are presented. Students develop small full-custom and standard-cell layouts up to the point where the data base could be used to manufacture parts. Prerequisite: ELEC 302, 402. (ELEC 402 may be taken concurrently.)

ELEC 433 Hybrid Microelectronics — An introductory course covering the design, fabrication, and application of hybrid (thick film) microcircuits. The course begins with an overview of the thick film production process, the properties and characteristics of thick film materials, and the resulting thick film design guidelines. Students are introduced to IC-GRAPH, an IBM PC software tool for the interactive layout of microelectronic production process masks. Active RC filters are an application area that can take advantage of the precision resistor capabilities of custom thick film circuits. Students are introduced to procedures for generating the modern filter expressions (Butterworth, Che-

byshev, Optimum, Bessel, etc.) and active RC circuits that are capable of synthesizing these filters. Lowpass, highpass, bandpass and band reject filters are investigated. Signal Flow Graphs are introduced as a circuits analytic tool and the computer software tool ACNAP is employed for predicting proposed design theoretical performance. Students perform a complete thick film active filter design project. Prerequisite: ELEC 303, MATH 343.

ELEC 434 PASCAL — Begins with an overview of microcomputer operating systems, programming languages and compilers and interpreters. The IBM personal computer is used throughout the course for interactive student training. The main part of the course covers PASCAL language programming and emphasizes structured programming techniques. Students will gain reasonable proficiency at writing short PASCAL programs and calling external subroutines or DOS functions. Prerequisite: ELEC 102.

ELEC 436 Analog Integrated Circuit Design — An introduction to the analysis and design of analog integrated circuits. The course starts with a review of basic MOS and BJT transistor operation and single transistor linear circuits. Circuit design techniques specific to IC design are then introduced and the course proceeds to techniques needed for combining stages into a complete operational amplifier. The course includes an introductory treatment of frequency response, compensation, pole splitting, and slewing. Students design complete CMOS and BJT op-amps using both algebraic and computer stimulation techniques and then implement their designs using transistor arrays in the laboratory. Prerequisite: ELEC 303, 433.

ELEC 437 Principles of VLSI Design — A continuation from ELEC 432. More advanced topics in logic design, analysis, and simulation are covered including symbol library creation (Mentor) and behavioral language modelling. MOS chip layout and simulation concepts are further developed with emphasis on the CMOS process. Both full-custom layouts and design with gate arrays (ULAs) are explored. This includes custom PLA techniques and algorithmic design. Design projects are taken to the stage where they could be sent out for manufacture. In addition to layout, students learn to use circuit extraction (MEXTRA) and circuit simulation (SPICE) programs. Analytical treatments are presented in parallel. Both static and dynamic logic structures are discussed and simulated. Laboratory work is done on Mentor Graphics workstations and IBM PCs. Prerequisite: ELEC 302, 402, 432.

ELEC 438 Microelectronic Applications — A continuation of ELEC 433 stressing analog filter design employing custom CMOS monolithic integrated circuits. The course begins with the design of doubly terminated lossless ladder networks. Switched-capacitor equivalent circuits are then introduced and explained, allowing the realization of switched-capacitor equivalent ladder networks. The Z-Transform is introduced to allow a more general approach to discrete time (sampled) filter circuit design. Through the aid of Bilinear Transform and Z-Plane mapping procedures, students learn to convert any analog (continuous time) filter expression into its equivalent discrete time low pass, highpass, bandpass, or band reject forms and their ultimate synthesis via a cascade of monolithic switched-capacitor biquad circuits. Students design, assemble, and test a switched-capacitor filter. The course terminates by returning to the thick-film hybrid circuit and investigating its potential in the area of high frequency and very high frequency circuit design. Prerequisite: ELEC 433.

ELEC 490 Co-op 2

MATH 143 Basic Technical Mathematics for Electrical — Common and natural logarithms, logarithmic/semilogarithmic

graphs, decibels, exponential growth and decay. Systems of linear equations, determinants, application to electrical networks. Trigonometric functions, identities, solution of triangles, graphing and addition of sinusoidal functions. Complex numbers, rectangular/polar transformations, phasor representation of sinusoidal waveforms.

MATH 243 Calculus for Electrical — The derivative, differentiation rules, applied maxima/minima, and implicit differentiation with applications to electrical technology. Antidifferentiation, the indefinite integral and the definite integral including area, mean value and RMS value. Differentiation and integration of trigonometric, logarithmic and exponential functions.

MATH 343 Transform Calculus for Electrical

OPMT 149 Small Business Fundamentals — The course will be centered around the preparation of comprehensive, professional business plan for a small business of the students' own choosing, which shall be within the students' technological field. Students will work in groups of three, minimum two. There will be several assignments, all of which will comprise the total business plan for the proposed venture.

The final plan will be of a quality to inspire investor and lender support.

Topics relevant to the plan will be introduced in the one hour weekly lecture. The two hour lab time will see these topics further developed in a seminar format. There will also be a requirement for at least three hours a week from each student outside class to work on the major assignment of the business plan.

OPMT 182 Operations Management — Covers problem-solving and decision making approaches to a project installation. Topics include: PERT networks, CPM barcharts, work measuring techniques in planning and project installations, method study techniques, acceptable management principles in labor supervision.

PHYS 106 PHYSICS for Electrical Technology — A general level course about physical quantities, their properties, relationships, how they affect each other and their connecting principles. Motion, force, mechanical energy and power are studied concerning translational and rotational motion. Then follows basic electricity, atomic physics and the band theory of solids and its application to semiconductor devices. The lab program emphasizes measurements, data analysis and experimental techniques while confirming and expanding the lecture concepts.

PHYS 206 Physics for Electrical Technology — Topics include sound, light and optics, basic electricity and magnetism, basic semiconductor theory, atomic and nuclear phenomena. Mathematical treatment requires algebra and trigonometry and possibly some calculus.

TCOM 104 Technical Writing — This course emphasizes clear, correct, concise technical writing in the electrical/electronics field. Students learn how to organize technical information, illustrate documents, define and describe technical objects and processes, write routine letters, memos and instructions, and summarize technical articles. Students also write a resume and application letter for Co-op.

TCOM 204 Technical Writing — In this course students prepare a professional job search package, practise interviewing skills, and write informal reports. They also learn techniques and formats for writing documentation. Students also do technical briefings. Prerequisite: TCOM 104.

Mechanical Technology

Design and Manufacturing Options

The mechanical technologist may be involved in the design, construction and installation of machines and mechanical devices, or in the production side of manufacturing. It is a field of tremendous scope in that specialists must be able to analyze problems, propose efficient technical solutions, implement these solutions and evaluate the results.

Job Opportunities

Graduates can choose from a diversity of work situations. Consulting engineering offices employ mechanical technologists as design draftsmen for machinery, steelwork, piping, power plants and installation. Others may choose to take up positions in plant engineering offices, production departments or estimating departments. Additional opportunities exist in testing, inspection, installation, service and technical sales. Supervisory posts may be assumed after appropriate job experience.

The Program

In the first three terms, all students in the technology have the same curriculum which includes math, physics and specialized studies in mechanical engineering, production and materials. Lecture material is given practical application in problem solving and design sessions, and in lab and shop assignments. Field trips to industrial settings are an important adjunct to the classroom and lab and are also useful in helping students decide on an area of speciality. In the final term of their second year, students stream into one of two options: **Design or Manufacturing**.

The Mechanical Technology reserves the right to limit the number of students in any of its options.

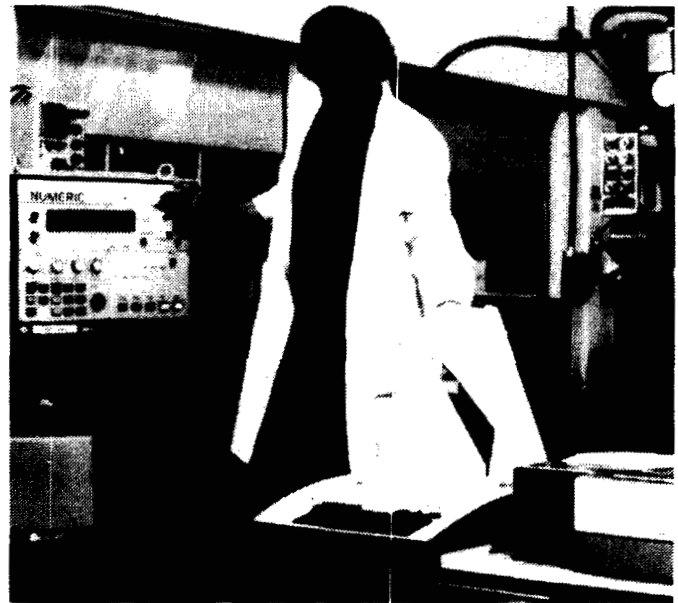
This program is accredited by the Applied Science Technologists and Technicians of BC.

Prerequisites

Algebra 12 and Physics 11 are course requirements for this program. Applicants should have a solid academic background and good communications skills, be able to apply ideas in practical situations and be able to work effectively with people in a team situation.

Faculty and Staff

S.C. Todd, M.I.Mech.E., C.Eng., F.I.E.D., PEng., Department Head
 E.B. Barry, B.Sc.
 R.O. Darling, B.Sc., PEng.
 P. Dollan, H.N.C.
 D.C. Gerlitz, B.Sc., M.S., PEng. Program Head, Design and Production
 A. Graham, H.N.C.
 R.G. Graham, B.Sc., M.A.S.H.R.A.E., PEng., Program Head, Systems
 G. Henderson, Dipl.T., A.Sc.T.
 B.E. Horlacher, Dipl.T.
 G.D. Johnson, M.I.Mech.E., C.Eng., M.I.Prod.E. PEng., Program Head, Part-time Studies
 K. Johnson, A.S.T.M.E.
 E.H. Labounty, M.A.S.H.R.A.E.
 H. Rienks, Dipl.T., A.Sc.T.
 V.M. Strijack, B.Sc., PEng., Assistant Department Head
 J.P. Sullivan, B.Sc., PEng., M.A.S.H.R.A.E.



TECHNOLOGY: Mechanical

	Clim hrs/wk
Level 1	
CDCM 101 Computer Science 1	3.0
CHSC 105 Engineering Materials.....	4.0
MATH 149 Basic Technical Mathematics for Mechanical	5.0
MECH 100 Mechanical Drafting 1	3.0
MECH 104 Statics.....	4.0
MECH 106 Manufacturing Processes 1	4.0
MECH 107 Thermal Processes	3.0
TCOM 109 Technical Communication — Mechanical..	4.0
Level 2	
CHSC 205 Engineering Materials.....	4.0
MATH 249 Calculus	4.0
MECH 200 Mechanical Drafting 2	3.0
MECH 205 Dynamics (Term 2A)	4.0
MECH 206 Mechanics of Materials	4.0
MECH 209 Manufacturing Processes 2	4.0
OPMT 145 Engineering Economy (Term 2B).....	4.0
PHYS 216 Physics for Mechanical Technology	4.0
TCOM 210 Technical Communication.....	4.0

PROGRAM: Mechanical Design

Level 3	
CDCM 349 CAD Drafting 1	4.0
ELEC 257 Electrical Equipment	4.0
MATH 349 Numerical Methods for Mechanical	4.0
MECH 301 Machine Design 1.....	4.0
MECH 302 Thermal Engineering 1	4.0
MECH 303 Fluid Mechanics.....	3.0
MECH 304 Manufacturing Processes 3	4.0
MECH 320 Fluid Power 1.....	3.0
Level 4	
CDCM 419 CAD Drafting 2	4.0
ELEC 255 Instrumentation for Mechanical	4.0
MATH 494 Computer Graphics for Mechanical	3.0
MECH 401 Machine Design 2.....	5.0
MECH 402 Theory of Mechanisms	4.0
MECH 404 Thermal Engineering 2	4.0
MECH 406 Fluid Systems.....	3.0
MECH 420 Fluid Power 2.....	3.0

PROGRAM: Mechanical Manufacturing

	Cirm hrs/wk
Level 3	
CDCM 349 CAD Drafting 1	4.0
ELEC 257 Electrical Equipment 1	4.0
MATH 349 Numerical Methods for Mechanical	4.0
MECH 301 Machine Design 1	4.0
MECH 302 Thermal Engineering 1	4.0
MECH 303 Fluid Mechanics	3.0
MECH 304 Manufacturing Processes 3	4.0
MECH 320 Fluid Power 1	3.0
Level 4	
ELEC 470 CNC and Robotic Languages	4.0
MATH 449 Statistics and Quality Control for Mechanical	4.0
MECH 406 Fluid Systems	3.0
MECH 413 Tool Design	3.0
MECH 414 Metrology and CNC	6.0
MECH 420 Fluid Power 2	3.0
OPMT 182 Industrial Engineering (Mechanical)	4.0
OPMT 411 Production Engineering Management	4.0

Course Descriptions

CDCM 101 Computer Science 1 — Introduction to Computer Science and programming using BASIC. Emphasis will be on structured problem solving. Applications drawn from the engineering disciplines.

CDCM 349 CAD Drafting 1 — Rudiments of computer aided drafting. Machine log-on procedures, simple 2-D drawings, orthographic projection, dimensioning, annotations.

CDCM 419 CAD Drafting 2 — A continuation of CAD Drafting 1. Elementary 3D modelling auxiliary, isometric and perspective projections.

CHSC 105 Engineering Materials — Comparative properties of all classes of engineering materials including metals, alloys, polymers, concrete, wood and ceramics. Common causes of failure in service including fatigue, weathering, embrittlement and corrosion.

CHSC 205 Engineering Materials — Continuation of CHSC 105.

ELEC 255 Instrumentation for Mechanical — Topics include basic devices used for measuring pressure, temperature, level, density and flow. Instrument static and dynamic performance. Instrument application to industrial processes. Design of pneumatic and hydraulic measurement and control equipment using high-gain amplifiers and negative feedback. Basic principles of automatic control, process, dynamic behavior and controllability. On/off, proportional, integral and derivative control. Control strategy. Ratio, cascade, multivariable and feedforward systems. Introduction to computer control.

ELEC 257 Electrical Equipment — An introduction to industrial electrical equipment. Topics include AC and DC motors and their application to electro-mechanical drive systems; protecting and controlling related equipment; sources of energy; transformation into primary and secondary voltage levels, distribution of power throughout the plant; switching; voltage control and power factor correction.

ELEC 470 CNC and Robotic Languages — Introduces the student to current CNC and Robot languages such as APT and VAL. Investigates the integrated manufacturing centre. Prerequisite: CDCM 311 and MECH 130 or CDCM 303.

MATH 149 Basic Technical Mathematics for Mechanical — Introduction to differential and integral calculus of polynomial functions including appropriate support topics from algebra, analytical geometry, plane geometry, solid geometry, trigonometry and the theory of logarithms and exponential functions. There will be a strong emphasis on applications to the physical sciences and mechanical engineering.

MATH 249 Calculus for Mechanical — An introduction to the differential and integral calculus of trigonometric, logarithmic and exponential functions and their application, maxima and minima, areas and volumes, centroids and moments of inertia, calculation of work, bending beams, functions of several variables and partial derivatives, and elementary first order differential equations.

MATH 349 Numerical Methods for Mechanical — Numerical integration, solution of algebraic and transcendental equations by iterative methods, numerical solution of differential equations and numerical differentiation. Matrix approach to 2-D and 3-D transformations with application to computer graphics. Gauss-Jordan method applied to the solution of systems of linear equations. Linear programming using the simplex method and the transportation problem.

MATH 449 Statistics and Quality Control for Mechanical — Organization and graphical presentation of data, frequency distributions and measures of central tendency, variation and other measures. Probability theory and laws. Random variables, discrete and continuous theoretical distributions. Sampling, estimation and hypothesis testing with both large and small samples. Method of least squares, regression and correlation. Control chart concepts and application, acceptance sampling. Chi-squared tests. Non-parametric statistics

MATH 494 Computer Graphics for Mechanical — Introduces students to interactive BASIC, and concepts of programming in two and three dimensions. Students experience "hands-on" practice with computer graphics systems.

MECH 100 Mechanical Drafting 1 — Techniques of producing and reading mechanical drawings using standard format and the development of basic skills in applying these techniques. Use of instruments, line work, lettering, geometric constructions isometrics, with emphasis placed on orthographic projection, auxiliary views, sections, dimensions and working drawings.

MECH 104 Statics — Vectors, force systems, concurrent and coplanar, nonconcurrent and coplanar. Graphical representation and solutions. Ideas of equilibrium. Mathematical representation of equilibrium. Analysis of frames. Statically determined structures. Redundancies. Beams, principles of moments and centroids. Second moment of area.

MECH 106 Manufacturing Processes 1 — A basic orientation course which provides the student with practice in metal removal, and a study of related theory.

MECH 107 Thermal Processes — Introduction to heat and fluid processes. Steam tables, first law of thermodynamics. Basic steam power and refrigeration cycles.

MECH 200 Mechanical Drafting 2 — Advanced techniques including limits and fits, isometric and orthographic single line piping diagrams, descriptive geometry, intersections, development, gears, threads and fasteners, weld symbols, working drawings and projects.

MECH 205 Dynamics — Kinematics: basic equation of motion, motion diagrams, trajectories. Kinetics: Newton's Laws, inertia,

rectilinear and rotational kinetics, systems of bodies. Work, energy, power and efficiency.

MECH 206 Mechanics of Materials — Stress, strain and deflection. Tension, compression, shear, torsion, deflection and buckling of material under load. Beams, columns, shafts, thin- and thick-walled cylinders, riveted and welded joints.

MECH 209 Manufacturing Processes 2 — Detailed knowledge of basic machine tools, evaluation of design and production features. Organized processing, break even points, equal cost quantities, estimating production costs, machine tool specification, installation and maintenance systems.

MECH 301 Machine Design 1 — The theory in prerequisite courses is covered plus combined stresses with emphasis on solution by Mohr's circle; theories of failure; stress concentration; fatigue phenomena; welded connections; bolted and riveted connections; spur; helical and worm gear drives; speed reducers; belt and roller chain drives; flexible couplings; shafts; antifriction and journal bearing; brakes and clutches; power screws; helical and leaf springs; an introduction to mechanical vibrations with emphasis on the critical speeds of rotating assemblies. Continued in MECH 401.

MECH 302 Thermal Engineering 1 — First and second law of thermodynamics. Steady and non-flow energy equations, specific heats of gases, vapor tables, gas and vapor processes. Carnot, Rankine and basic IC engine cycles. Air compressors. Heat transfer.

MECH 303 Fluid Mechanics — Basic principles of fluid properties, energy losses, Reynold's number, Moody diagram, flow measuring devices, dynamics of flow lift and drag. Fluid statics.

MECH 304 Manufacturing Processes 3 — In this course the student makes a detailed study of processes such as casting hot and cold forming, extruding, forging, stamping, pressing and material joining, including machines and materials. Quantities/costs will be investigated. Manufacturing processes recently introduced will be discussed in oral presentations by the student. Visits to local industries will be arranged.

MECH 320 Fluid Power 1 — Provides an understanding of pneumatic control systems. Fluid power components, their symbols, function and construction are examined and used in the design, construction and testing of simple and sequential control systems. Sizing calculations for system components are covered.

MECH 401 Machine Design 2 — Basic principles derived in MECH 301 are applied to various design elements. Topics include springs, roller bearings, power screws, spur and helical gearing, level and worm gearing, couplings, brakes, clutches.

MECH 402 Theory of Mechanisms — Designed to provide a study of motion in machines. Topics include velocity and acceleration diagrams and cams.

MECH 404 Thermal Engineering 2 — Mixtures of gases and vapors, Gibbs-Dalton Law, psychrometry, air conditioning, combustion processes and nozzle flow; analysis of steam and gas turbines and jet propulsion. Practical lab investigations by students.

MECH 406 Fluid Systems — Dimensionless parameters. Pump characteristics, operation and maintenance. Cavitation. Air movement and supply, fan performance and characteristics, duct sizing and networks.

MECH 413 Tool Design — The course includes introduction to design of special purpose tooling, process planning, design con-

siderations of various types of jigs, fixtures, gauges, metal-cutting dies, feed mechanisms, presses, scrap strip-layout, standard parts. Assignments will have to be worked on away from classroom.

MECH 414 Metrology and CNC — Includes measurement of surface texture and flatness, optical and electrical comparators, metrology of screw threads, precision measuring instruments, fundamentals of inspection, mass production gauging, computer numerical control programming and program verification on a 3-axis CNC mill. Prerequisite: MECH 230.

MECH 420 Fluid Power 2 — Provides an understanding of hydraulic control systems and an introduction to fluidic control systems and control logic. Fluid power components, their symbols, function and construction are examined and used in the design, construction and testing of a variety of hydraulic control systems. Sizing calculations for system components are also covered. Prerequisite: MECH 320.

OPMT 145 Engineering Economy — Emphasizes the importance of making sound economic decisions when faced with alternative methods of solving technical problems. The course material provides the basic skills and concepts required to analyze comparative costs and to understand the time value of money (interest), inflation, depreciation, running costs, salvage value and tax considerations.

OPMT 182 Operations Management — Students will be introduced to problem situations at the management level of a production organization. Each topic is introduced by lecture and continued by lab work involving practice in various solution techniques. Students are expected to produce management reports for each assignment. The topics covered are: business forecasting at the product level; inventory control including EOQ, ELS and an introduction to MRP; project control using CPM and PERT; quantitative methods including linear programming and waiting line techniques; and an introduction to business accounting and finance, including production cost accounting. All students are required to work with packaged computer programs.

OPMT 411 Production Engineering Management — Presents aspects of management and the industrial engineering functions of a manufacturing plant. It is intended for technologists, engineers, designers, draftpersons and technical sales people who wish to have a clearer understanding of the range of problems and decisions involved in a manufacturing organization. Topics include management and plant organization, plant location and layout, production control, maintenance management, production planning, job design and time standards.

PHYS 216 Physics for Mechanical Technology — A general level course covering the elements of wave motion, sound, light and basic electricity and magnetism.

TCOM 109 Technical Communication for Mechanical — In this course students learn the basic skills to become effective writers and speakers in the mechanical industry. They learn the layout, content and graphic skills of technical writing, and research and employment application techniques. They write technical memos, letters and descriptions, and give an oral report.

TCOM 210 Technical Communication for Mechanical — In this course, students practice the reporting techniques used in the engineering mechanical industries. They write feasibility reports, proposals, memos, letters, comparison and progress reports and a formal technical report. They also present an oral technical report. Prerequisite: TCOM 109.

Mechanical Systems Technology

The graduate of this program will be able to pursue a career in a field of Mechanical Systems for residential, commercial, institutional and industrial buildings. Graduates will be prepared for the design and installation of water supply, drainage, fire protection, refrigeration, heating, ventilating and air conditioning.

Job Opportunities

Mechanical engineers, working in liaison with architects, structural engineers and electrical engineers, oversee design work on systems for most large buildings. As support staff, trained mechanical systems technologists who can function with minimum of supervision as designers, specification writers, field inspectors, and drafting personnel are required. Mechanical contractors bid competitively for mechanical systems work, and require trained systems technologists as estimators and project management assistants.

Systems in newly completed and existing buildings have been receiving more attention in recent years. Services in this area include system management programs to optimize energy efficiency; testing and balancing of new systems; and physical changes to existing systems to realize greater fuel economy.

The Program

Course material encompasses water supply, drainage, fire protection, refrigeration, heating, ventilating and air conditioning, backed by support courses which include fluid engineering, thermodynamics, engineering economy and computer science. In recent years, the pursuit of greater energy efficiency and safety in buildings has placed new demands on the systems base from which the graduate can effectively participate in achieving these objectives.

It is anticipated that this program will be accredited by the Applied Science Technologists and Technicians of British Columbia.

Prerequisites

Algebra 12 and Physics 11 are course requirements for this program. Applicants should have a solid academic background and good communications skills, be able to apply ideas to practical situations and be able to work effectively with people in a team situation. Supervisory posts may be assumed after appropriate job experience.

Faculty and Staff

S.C. Todd, M.I.Mech.E., C.Eng., F.I.E.D., P.Eng., Department Head
 E.B. Barry, B.Sc.
 R.O. Darling, B.Sc., P.Eng.
 P. Dollan, H.N.C.
 O.C. Edwards, B.A.Sc., M.A.Sc., P.Eng.
 D.C. Gerlitz, B.Sc., M.S., P.Eng. Program Head, Design and Production
 A. Graham, H.N.C.
 R.G. Graham, B.Sc., M.A.S.H.R.A.E., P.Eng., Program Head, Systems
 G. Henderson, Dipl.T., A.Sc.T.
 B.E. Horlacher, Dipl.T.
 G.D. Johnson, M.I.Mech.E., C.Eng., M.I.Prod.E.P.Eng., Program Head, Part-time Studies



K. Johnson, A.S.T.N.E.
 E.H. Labounty, M.A.S.H.R.A.E.
 H. Rienks, Dipl.T., A.Sc.T.
 V.M. Strijack, B.Sc., P.Eng., Assistant Department Head
 J.P. Sullivan, B.Sc., P.Eng., M.A.S.H.R.A.E.

PROGRAM: Mechanical Systems

	Clrm hrs/wk
Level 1	
CDCM 101 Computer Science 1	3.0
CHSC 105 Engineering Materials.....	4.0
MATH 149 Basic Technical Mathematics	5.0
MECH 104 Statics.....	4.0
MECH 100 Mechanical Drafting 1	3.0
MECH 106 Manufacturing Processes 1	4.0
MECH 107 Thermal Processes	3.0
TCOM 109 Technical Communication.....	4.0
Level 2	
MATH 249 Calculus for Mechanical.....	4.0
MECH 105 Engineering Economy (Term 2B).....	4.0
MECH 205 Dynamics (Term 2A).....	4.0
MECH 206 Mechanics of Materials	4.0
MSYS 103 Plumbing	3.0
MSYS 200 Systems Drafting 2	3.0
MSYS 212 Heating and Ventilating 1	4.0
PHYS 216 Physics for Mechanical.....	4.0
TCOM 210 Technical Communication.....	4.0
Level 3	
BLDG 112 Building Construction 1.....	3.0
CDCM 349 CAD Drafting 1	4.0
ELEC 256 Instrumentation for Mechanical	5.0
ELEC 257 Electrical Equipment	4.0
MATH 349 Numerical Methods for Mechanical	4.0
MECH 302 Thermal Engineering 1	5.0
MECH 303 Fluid Mechanics	3.0
MSYS 301 Heating and Ventilating 2	3.0

	Cirm hrs/wk
Level 4	
MECH 404 Thermal Engineering 2	4.0
MECH 406 Fluid Systems	3.0
MECH 410 Mechanical Estimating (Term 4B)	4.0
MSYS 400 Air Conditioning Systems	6.0
MSYS 403 System Noise Control (Term 4A)	4.0
MSYS 404 Mechanical Equipment	4.0
MSYS 405 Maintenance (Term 4B)	4.0
MSYS 406 Fire Protection (Term 4A)	4.0
OPMT 460 Industrial Engineering	4.0

Course Descriptions

BLDG 112 Building Construction 1 — Principles of building construction in terms of the assembly of materials. Examination of typical systems of wood and masonry construction. Study of architectural detailing and the origins and purposes of building and zoning by-laws. Application of the above components to the preparation of working drawings.

CDCM 101 Computer Science 1 — Introduction to Computer Science and programming using BASIC. Emphasis will be on structured problem solving. Applications drawn from the engineering disciplines.

CDCM 349 CAD Drafting 1 — Rudiments of computer aided drafting. Machine log-on procedures, simple 2-D drawings orthographic projection, dimensioning, annotations.

ELEC 256 Instrumentation for Mechanical — Topics include basic devices used for measuring pressure, temperature, level, density and flow. Instrument static and dynamic performance. Instrument application to industrial processes. Design of pneumatic and hydraulic measurement and control equipment using high-gain amplifiers and negative feedback. Basic principles of automatic control, process, dynamic behavior and controllability. On/off, proportional, integral and derivation control. Control strategy. Ratio, cascade, multivariable and feedforward systems introduction to computer control.

ELEC 257 Electrical Equipment — An introduction to industrial electrical equipment. Topics include AC and DC motors and their applications to electro-mechanical drive systems; protecting and controlling motors; industrial electrical power systems and related equipment; sources of energy; transformation into primary and secondary voltage levels, distribution of power throughout the plant; switching; voltage control and power factor correction.

MATH 149 Basic Technical Mathematics for Mechanical — Introduction to differential and integral calculus of polynomial functions including appropriate support topics from algebra, analytical geometry, plane geometry, solid geometry, trigonometry and the theory of logarithms and exponential functions. There will be a strong emphasis on applications to the physical sciences and mechanical engineering.

MATH 249 Calculus for Mechanical — An introduction to the differential and integral calculus of trigonometric, logarithmic and exponential functions and their application, maxima and minima, areas and volumes, centroids and moments of inertia, calculation of work, bending beams, functions of several variables and partial derivatives, and elementary first order differential equations.

MATH 349 Numerical Methods for Mechanical — Numerical integration, solution of algebraic and transcendental equations by iterative methods, numerical solution of differential equations and numerical differentiation. Matrix approach to 2-D and 3-D

transformations with application to computer graphics. Gauss-Jordan method applied to the solution of systems of linear equations. Linear programming using the simplex method and the transportation problem.

MECH 100 Mechanical Drafting 1 — Techniques of producing and reading mechanical drawings using standard format and the development of basic skills in applying these techniques. Use of instruments, line work, lettering, geometric construction isometrics, with emphasis placed on orthographic projection, auxiliary views, sections, dimensions and working drawings.

MECH 104 Statics — Vectors, force systems, concurrent and coplanar, nonconcurrent and coplanar. Graphical representation and solutions. Ideas of equilibrium. Mathematical representation of equilibrium. Analysis of frames. Statically determined structures. Redundancies. Beams, principles of moments and centroids. Second moment of area.

MECH 106 Manufacturing Processes 1 — A basic orientation course which provides the student with practice in metal removal, and a study of related theory.

MECH 107 Thermal Processes — Introduction to heat and fluid processes, steam tables, first law of thermodynamics. Basic steam power and refrigeration cycles.

MECH 205 Dynamics — Kinematics: basic equation of motion, motion diagrams, trajectories. Kinetics: Newton's Laws, inertia, rectilinear and rotational kinetics, systems of bodies. Work, energy power, efficiency.

MECH 206 Mechanics of Materials — Stress, strain and deflection. Tension compression, shear, torsion, deflection and buckling of material under load. Beams, columns, shafts, thin- and thick-walled cylinders, riveted and welded joints.

MECH 302 Thermal Engineering 1 — First and second law of thermodynamics. Steady and non-flow energy equations, specific heats of gases, vapor tables, gas and vapor processes. Carnot, Rankine and basic IC engine cycles. Air compressors. Heat transfer.

MECH 303 Fluid Mechanics — Basic principles of fluid properties, energy losses, Reynold's number, Moody diagram, flow measuring devices, dynamics of flow lift and drag. Fluid statics.

MECH 320 Fluid Power 1 — Provides an understanding of pneumatic control systems. Fluid power components, their symbols, function and construction are examined and used in the design, construction and testing of simple and sequential control systems. Sizing calculations for system components are covered.

MECH 404 Thermal Engineering 2 — Mixtures of gases and vapors, Gibbs-Dalton Law, psychrometry, air conditioning, combustion processes and nozzle flow; analysis of steam and gas turbines and jet propulsion. Practical lab investigations by students.

MECH 406 Fluid Systems — Dimensionless parameters. Pump characteristics, operation and maintenance. Cavitation. Air movement and supply, fan performance and characteristics, duct sizing and networks.

MECH 410 Mechanical Estimating — Basic theories and principles of estimating construction costs and direction for organizing facts from bidding documents. Measurement and pricing using "price master" and "labor calculator", for ventilation, domestic hot water heating and sanitary drainage systems.

MSYS 103 Plumbing — Topics include codes, basic engineering principles and graphic presentations related to plumbing systems design, load calculations, piping methods, sizing of system components for storm and sanitary drainage and water distribution. Some drafting skill will be required.

MSYS 200 Systems Drafting 2 — Further topics in mechanical drafting practices and projects on systems in buildings and plants.

MSYS 212 Heating and Ventilating 1 — Covers the principles involved with heat loss in buildings and practises of heating and ventilating encompassing a study of system components and design procedures. These will then be applied to the preparation of heat loss calculations and working drawings for a heating/ventilating system.

MSYS 301 Heating and Ventilating 2 — Principles and practices of heating and ventilating for residential, commercial and institutional buildings. Instructional material encompasses fuel oil, gas and solar heat energy sources; fuel handling heating boilers; solar collectors; building heat loss evaluation; building ventilation, load evaluation; space air distribution; ducted air distributions; warm air heating.

MSYS 400 Air Conditioning Systems — Part 3 of a three-part course on heating, ventilating and air conditioning. Properties of air extending use of psychrometric chart to air conditioning comfort criteria and examination of air conditioning processes; refrigeration for air conditioning, encompassing evaporator, compressor, condensor and expansion valve performance characteristics and selection; air conditioning systems, encompassing representative unitary, constant volume and variable volume systems.

MSYS 403 System Noise Control — Lab assignments are arranged to solve fundamental problems of sound propagation; use mechanical equipment sound performance data to select equipment to satisfy acceptable noise levels; and to recognize and arrive at solutions to potential mechanical system noise problems in the design stage.

MSYS 404 Mechanical Equipment — A study of drive configurations, prime movers, fans, pumps, heat exchangers, pressure vessels from an application, specifications, maintenance and safety point of view.

MSYS 405 Maintenance — The elements of this course are basic systems, preventative maintenance and budget costs, maintenance planning, estimating, scheduling, measurement and inventory.

MSYS 406 Fire Protection — Includes mechanical fire protection systems; regulations and codes of practice; building hazard classification; stand pipe and sprinkler systems; systems components and design to NFPA 13.

OPMT 145 Engineering Economy — Emphasizes the importance of making sound economic decisions when faced with alternative methods of solving technical problems. The course material provides the basic skills and concepts required to analyze comparative costs and to understand the time value of money (interest), inflation, depreciation, running costs, salvage value and tax considerations.

OPMT 460 Industrial Engineering — Covers problem-solving and decision making approaches to a project installation. Topics include: PERT networks, CPM barcharts, work measuring techniques in planning and project installations, method study techniques, acceptable management principles in labor supervision.

PHYS 216 Physics for Mechanical — A general level course covering the elements of wave motion, sound, light and basic electricity and magnetism.

TCOM 109 Technical Communication — In this course students learn the basic skills to become effective writers and speakers in the mechanical industry. They learn the layout, content and graphic skills of technical writing, and research and employment application techniques. They write technical memos, letters and descriptions, and give an oral report.

TCOM 210 Technical Communication — In this course, students practice the reporting techniques used in the engineering mechanical industries. They write feasibility reports, proposals, memos, letters, comparison and progress reports and a formal technical report. They also present an oral technical report. Prerequisite: TCOM 109.

Plastics Technology

This is a new two-year diploma program offered for the first time in B.C. The first year commences in September 1987. The program is designed to provide practical and theoretical training in production processes used in the manufacture of plastic products used in a variety of applications, e.g., packaging, coatings and adhesives, construction, electronics communications, domestic and automotive to name but a few.

Job Opportunities

It is noteworthy that the plastics industry is the fastest growing manufacturing industry in Canada. Graduates of the Plastics Technology program will find opportunities for satisfying and rewarding careers in manufacturing research and development, technical sales, marketing, machine setting and troubleshooting, product design inspection and quality control. It is anticipated that supervisory posts will be assumed with appropriate job experience.

The Program

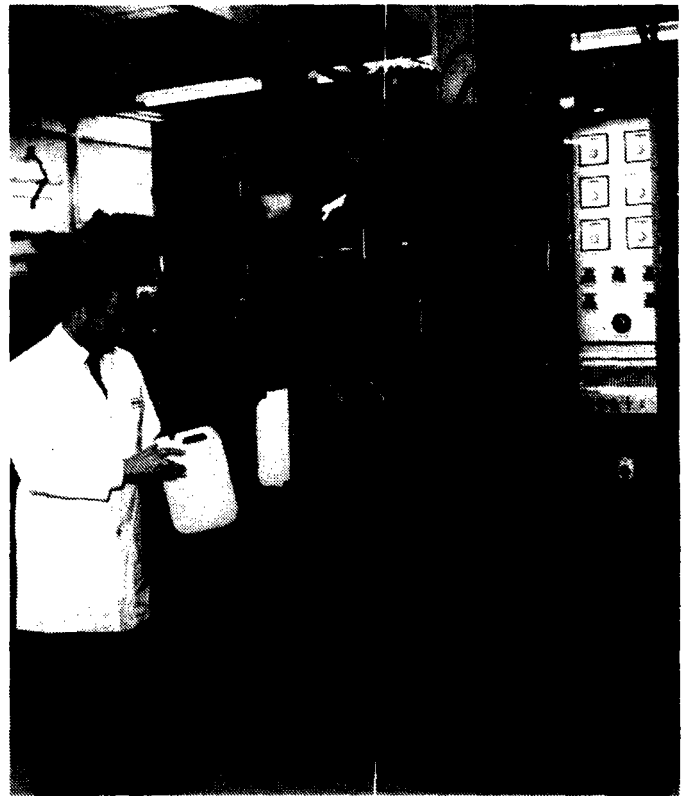
Emphasis is placed on plastics processes such as compression molding, injection molding, blow molding, extrusion and film sheet production and related testing procedures. A study of the construction and design of plastic dies and molds and product design is strongly backed by studies in materials plastics chemistry, mathematics, technical communication, mechanical design and computer aided drafting. It is anticipated that this program will be accredited by the Applied Science Technologists and Technicians of British Columbia.

Prerequisite

Algebra 12 and Chemistry 11 or Physics 11 are course requirements for this program. Applicants should have a solid academic background and good communication skills, be able to work effectively with people, and enjoy the challenge of applying ideas to practical situations.

Faculty and Staff

S.C. Todd, M.I.Mech.E., C.Eng.FIED, P.Eng., Department Head
J.E. Pretzlaff, Dipl.T., A.Sc.T.T.
D. Wilson, Ph.D., Program Head
For enquiries call: S.C. Todd, 432-8329 or D. Wilson, 432-8350



Robotics Technology

The Robotics Technology program will provide the student with knowledge of the applications of flexible automation equipment, the various mechanical systems used and the electronics incorporated for their control. Gaining "hands on experience" with a variety of industrial robots and machinery in a modern, well equipped lab will be emphasized. Particular attention will be given to applying automation techniques to British Columbia industries. The program includes 5 academic study levels and 2 salaried co-operative work terms during which the student can gain invaluable experience working in associated industries.

Semester System

The Robotics Technology operates on a modified semester system. There are two study periods of 15 weeks each year. Students are admitted in September. All levels (it takes five levels to complete the program) run concurrently. The Robotics option has only a September annual intake.

Co-operative Education is an integral part of the Robotics Technology. During this portion of the program, the student is placed in a robotics related work setting in consultation with BCIT and industry, on a paid basis.

Some benefits to students are:

1. The student will receive training in the classroom and workplace, a need expressed by industry due to the accelerating changes occurring in this technology.
2. There is more flexibility as to program entry and graduation.
3. Should there be a need to repeat a Level, that Level is available in each semester.
4. Valuable experience is gained in the robotics industry, making the student instantly employable upon graduation.

Transfer credit from the Robotics Technology program to British Columbia universities is possible on an individual basis.

Prerequisites

Algebra 12 and Physics 11, all with a C+ standing are required for this program.

Faculty and Staff

J.H. Casimir, B.A.Sc., P.Eng., Department Head
B. Fingarson, Dipl.T., A.Sc.T.
D. Lewis, B.A.Sc., (Mech), P.Eng., Program Head (Robotics)
P. Paleologou, M.Eng.

PROGRAM: Robotics

Level 1 (September Semester Only)	Cirm hrs/wk
ELEC 103 AC/DC Circuits	7.0
MATH 134 Basic Technical Mathematics for Robotics	7.0
MECH 106 Manufacturing Processes 1	4.0
MECH 320 Fluid Power 1.....	3.0
PHYS 108 Physics for Robotics Technology.....	6.0
TCOM 104 Technical Writing	3.0



Level 2 (January Semester Only)	
ELEC 102 Programming 1	3.0
ELEC 202 Digital Techniques 1	3.0
ELEC 203 Electronic Circuits 1	6.0
MATH 234 Calculus for Robotics	7.0
MECH 211 Manufacturing Processes	4.0
MECH 421 Fluid Power 2 for Robotics Technology.....	3.0
PHYS 208 Physics for Robotics Technology.....	5.0
ELEC 390 COOP 1 (May Semester Only).....	15.0

Level 3 (September Semester Only)	
ELEC 302 Digital Techniques 2	5.0
ELEC 303 Electronic Circuits 2	5.0
ELEC 305 Electrical Equipment 1	5.0
ELEC 315 Robot Fundamentals	6.0
MATH 343 Transform Calculus for Electrical.....	4.0
TCOM 204 Technical Writing	3.0

Level 4 (January Semester Only)	
ELEC 307 Pulse Techniques	5.0
ELEC 402 Digital Systems	6.0
ELEC 407 Feedback.....	6.0
ELEC 467 Robot Applications and Gripper Design....	4.0
ELEC 469 Robot Troubleshooting and Interfacing	5.0
ELEC 470 CNC Programming	5.0
ELEC 490 COOP 2 (May Semester Only).....	15.0

Level 5 (September Semester Only)	
ELEC 471 Digital Control using Microcomputers	6.0
ELEC 472 Robot Sensors	5.0
ELEC 473 Integrated Manufacturing Cell Design	5.0
ELEC 474 Drafting and Design Project.....	8.0
OPMT 149 Small Business Fundamentals	3.0
OPMT 183 Operations Management.....	4.0

Course Descriptions

ELEC 102 Programming 1 — Teaches structured computer programming with the BASIC computer language. Topics include the use of a disk based operating system, input and output commands, decision making, repetitive programming structures, subroutines, string manipulations and the use of graphics on the IBM PC.

ELEC 103 AC/DC Circuits — Definition of common electrical variables (potential, current, charge, power, etc.) and electrical circuit parameters (resistance, inductance and capacitance). Introduction to circuit analysis techniques applicable to DC and AC circuits.

ELEC 202 Digital Techniques 1 — Provides students with the basic concept of digital logic circuits. The course begins with an introduction to the binary (two states or levels) concept followed by a description of binary variables as related to mechanical switches and electromagnetic relays, and then moves on to circuits using electronic logic gates such as the AND/OR, Inverter, Exclusive/OR, NAND and NOR gate. Boolean algebra is introduced and the student is expected to simplify Boolean equations using Boolean identities or by using Karnaugh maps. The student will learn how to derive alternative symbols for the NAND/NOR gate using De Morgan's Theorem. Students will then be able to use the appropriate logic symbols and gating techniques correctly to analyze and construct combinational logic circuits.

ELEC 203 Electronic Circuits 1 — Explains how electronic circuits work, how to analyse them and how to design, modify and combine them to perform complex functions. Topics include interpretation of bipolar and field-effect transistor characteristic curves; voltage and current amplifying circuits; the transistor as a switch; loadline analysis; choice of Q-point; bias circuits; equivalent circuits; frequency response, feedback, oscillation response; oscillator circuits; power amplifiers of various types; heat sink calculations and characteristics and application of switching devices including the unijunction. Prerequisite: MATH 143, PHYS 106, ELEC 200 (ELEC 200 may be taken concurrently); or MATH 134, PHYS 108, ELEC 103 for Robotics.

ELEC 302 Digital Techniques 2 — Studies the utilization of logic gates using Boolean Algebra and Karnaugh maps. The TTL family specifications including noise margins, loading and propagation delays. The interfacing of various digital circuits. The encoding and decoding of numbering systems and digital arithmetic. Sequential logic, flip flops (RS, JK, D Type, Master slave) counters and shift registers. Also included are frequency counters, D/A and A/D converters and digital switching using transmission gates. Prerequisite: ELEC 202, 203, 303 and 307. (ELEC 303 and 307 may be taken concurrently.)

ELEC 303 Electronic Circuits 2 — A continuation of ELEC 203 Electronic Circuits 1. One half of the course deals with circuit applications not previously covered including DC power supplies, voltage and current regulation; small-signal tuned amplifiers, neutralising and the cascade configuration; wide band amplifiers; DC amplifiers; differential amplifiers. The remaining half of the course gives an introduction to linear integrated circuits, particularly the operational amplifier and some of its circuit applications including an introduction to active filters. Prerequisite: ELEC 200, 203, and MATH 243; or ELEC 103, ELEC 203 and MATH 234 for Robotics.

ELEC 305 Electrical Equipment 1 — Begins as a continuation of circuit analysis then moves on to the study of motors, generators, transformers and rectifiers. Topics include a review of phasor diagrams, power factors, three phase power and circuit

analysis, single and three phase power distribution systems, DC motors and generators, induction motors, Synchronous motors and generators, stepper motors, motor control circuits, transformers (single and three phase), and three phase rectification. Prerequisite: ELEC 200 or 208 and MATH 243 or 313, PHYS 206; (or ELEC 103, MATH 234 and PHYS 208 for Robotics).

ELEC 307 Pulse Techniques — Introduces pulse signal circuits such as clippers and clamps, transistor switches, astable and monostable multivibrators, Schmitt triggers, ramp generators, DC to DC converters and phase lock loops. Both discrete transistors (bipolar and FET) and CMOS integrated circuits are used in building all these circuits. Each circuit is analyzed in detail and its practical application is considered. Prerequisite: ELEC 200, 202, 203, MATH 243; (or ELEC 103, ELEC 202, ELEC 203 and MATH 234 for Robotics).

ELEC 315 Robot Fundamentals — Discusses the types of robots and the coordinate systems under which they operate. Investigates accuracy, repeatability in relation to load capability. Investigates various programming and control options and considers human and safety factors in robot deployment. Mechanics, power and sensor systems for robots are also covered. Prerequisite: ELEC 102, ELEC 203.

ELEC 390 Co-op 1

ELEC 402 Digital Systems — Applies knowledge gained in Digital Techniques 1 and 2 to study digital Mux, display Mux, tri-state, bus techniques, memory IC's and memory decoding schemes. A detailed introduction to microcomputer architecture is undertaken using the Z80 as an example. The student is also introduced to machine/assembly language programming, the CP/M operating system, as well as utilities such as an assembler, text editor, linker, software debugger, etc. Z80 timing, control, buffering, interfacing, interrupts and support chips are studied in detail using a small single board Z80 system. Prerequisite: ELEC 100, 102, 200, 202, 203, 302, 303, and 307.

ELEC 407 Feedback — An introduction to linear feedback theory and practice as applied to servomechanisms — motor position and speed control — and some electronic circuits including OP-AMPS, oscillators and voltage regulators. Block diagram transfer functions are developed from d-c for steady state, through sinusoidal, and BODE frequency analysis (including Gain and Phase margins) to Laplace transformed differential equations for root locus analysis of transient response and evaluation of control system performance. Prerequisite: ELEC 303 and MATH 343 (MATH 343 may be taken concurrently).

ELEC 467 Robot Applications and Gripper Design — Discusses applications of robots in automated manufacturing centres and the corresponding gripper and fixture design required for these applications. Prerequisite: ELEC 315, MECH 211, MECH 421.

ELEC 469 Robot Troubleshooting and Interfacing — Digital systems fundamentals and functions are reviewed followed by troubleshooting fundamentals. The operation of a microcomputer-based system is analyzed. Troubleshooting techniques are used to find faults in different parts of microcomputer-based systems. Various interfacing techniques between a computer and robot controller are also discussed. Prerequisite: MECH 421, ELEC 302, ELEC 303, ELEC 315 and ELEC 402 (402 to be taken concurrently).

ELEC 470 CNC Programming — An introduction to the codes required to program a Computer Numerical Control machine tool is given. APT, a computer assisted manufacturing programming language used to prepare these codes, is studied. Pro-

grams are prepared using geometric descriptive statements, tool motion and post processor commands. Repetitive programming techniques using loops and macros are investigated. Transformations of cutter location data are used. The data requirements for machining of irregular surfaces is investigated. Prerequisite: MECH 211 and ELEC 102 or equivalent.

ELEC 471 Digital Control Using Microcomputers — A continuation of ELEC 407 Feedback 1 where a microcomputer now replaces the analog PID controller. Prerequisite: ELEC 407, 402, 469.

ELEC 472 Robot Sensors — Investigates techniques and applications where robots are enhanced by the capability of vision and touch. Prerequisite: ELEC 467, 402, 469.

ELEC 473 Integrated Manufacturing Cell Design — Investigates the integration of NC machine tools with robots for machine loading/unloading. Discusses the complete integrated manufacturing centre with the addition of CAD/CAM down loading to the CNC/Robot controller. Prerequisite: ELEC 467, 470.

ELEC 474 Drafting and Design Project — A graduation paper researched and presented by the student on some aspect of robot design, programming or application.

ELEC 490 Co-op 2

MATH 134 Basic Technical Mathematics for Robotics — Trigonometric functions, identities, solution of triangles graphing and addition of sinusoidal functions. Complex numbers, rectangular/polar transformations, phasor representation of sinusoidal waveforms. Common and natural logarithms, logarithmic/semilogarithmic graphs, decibels, exponential growth and decay. Systems of linear equations, determinants, application to electrical networks.

MATH 234 Calculus for Robotics — The derivative, differentiation rules, applied maxima/minima and implicit differentiation with applications to electrical technology. Antidifferentiation, the indefinite integral and the definite integral including area, mean value and RMS value. Differentiation and integration of trigonometric, logarithmic and exponential functions. Prerequisite: MATH 134.

MATH 343 Transform Calculus for Electrical

MECH 106 Manufacturing Processes 1 — A basic orientation course which provides the student with practice in metal removal, and a study of related theory.

MECH 211 Manufacturing Processes — Evaluation of machine tool operations, organized processing, break even points and equal cost quantities, productivity and cost estimating. Machine tool specifications, installation and maintenance, testing and evaluation production welding processes and techniques. Prerequisite: MECH 106.

MECH 320 Fluid Power 1 — Provides an understanding of pneumatic control systems. Fluid power components, their symbols, function and construction are examined and used in the design, construction and testing of simple and sequential control systems. Sizing calculations for system components are covered.

MECH 421 Fluid Power 2 for Robotics — Provides an understanding of hydraulic control systems and an introduction to fluidic control systems and control logic. Fluid power components, their symbols, function and construction are examined and used in the design, construction and testing of a variety of hydraulic control systems. Sizing calculations for system components are also covered. Prerequisite: MECH 320.

OPMT 149 Small Business Fundamentals — The course will be centered around the preparation of a comprehensive, professional business plan for a small business of the students' own choosing, which shall be within the students' technological field. Students will work in groups of three, minimum two. There will be several assignments, all of which will comprise the total business plan for the proposed venture.

The final plan will be of a quality to inspire investor and lender support.

Topics relevant to the plan will be introduced in the one hour weekly lecture. The two hour lab time will see these topics further developed in a seminar format. There will also be a requirement for at least three hours a week from each student outside class to work on the major assignment of the business plan.

OPMT 183 Operations Management — The course is designed to survey the general background to Operations Management in terms of planning and organizing manufacturing operations.

Topics include facility location and layout, methods improvement, and production/inventory management.

Course material will be covered through lecture, labs, assignments and a student teamwork project.

PHYS 106 PHYSICS for Electrical Technology — A general level course about physical quantities, their properties, relationships, how they affect each other and their connecting principles. Motion, force, mechanical energy and power are studied concerning translational and rotational motion. Then follows basic electricity, atomic physics and the band theory of solids and its application to semiconductor devices. The lab program emphasizes measurements, data analysis and experimental techniques while confirming and expanding the lecture concepts.

PHYS 108 Physics for Robotics Technology — This general physics course emphasizes topics of special relevance to robotics. Part 1 introduces measurement and data analysis. Part 2 covers basic mechanics, including static equilibrium, work, energy, power, torque and rotational motion. Part 3 covers mobility. Part 4 covers semiconductor physics including the theory, construction and operation of semiconductor devices.

PHYS 208 Applied Physics for Robotics Technology — This general physics course emphasizes topics of special relevance to robotics. Part 1 covers magnetism and electromagnetism with applications in robotic pickup systems and stepping motors. Part 2 covers hydraulics and fluid flow. Part 3 covers thermal energy and thermodynamics. Part 4 covers advanced mechanics, with special emphasis on mechanical properties of matter, 3-D force systems, stress and vibrations. Parts 4 and 5 cover waves, sound and optics with related applications. Part 6 introduces radiation and radiation hazards related to robotics. Prerequisite: PHYS 108.

TCOM 104 Technical Writing — This course emphasizes clear, correct, concise technical writing in the electrical/electronics field. Students learn how to organize technical information, illustrate documents, define and describe technical objects and processes, write routine letters, memos and instructions, and summarize technical articles. Students also write a resume and application letter for Co-op.

TCOM 204 Technical Writing — In this course students prepare a professional job search package, practise interviewing skills, and write informal reports. They also learn techniques and formats for writing documentation. Students also do technical briefings. Prerequisite: TCOM 104.

School of Construction and Natural Resource Studies

Office of the Dean

Ron Hyde, B.S.A., M.Sc., P.Ag., Dean

Andrea Labé, Administrative Assistant/Executive Secretary to the Dean

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Biological Sciences Technology

The Biological Sciences Technology offers a variety of secure and worthwhile career possibilities encompassing indoor and outdoor work in large or small-scale settings. Food processing offers stable employment, even during unsettled economic conditions, since this industry is tied to population growth. Those with a concern for their environmental surroundings may gravitate towards landscape horticulture. Others may be interested in bioengineering, an important and challenging breakthrough in the twentieth century which makes use of such modern tools as gene splicing, protein engineering and cell fusion.

The Programs

The first term of the Biological Sciences Program provides students with a general background before they proceed to one of three options: Food Processing, Landscape Horticulture or Bioengineering. Programs and options in the Biological Sciences Technology are accredited by the Applied Science Technologists and Technicians of B.C. (Except for Bioengineering which will be submitted in the near future.)

Job Opportunities

Bioengineering graduates will be employed by biological research laboratories, chemical process industries, food and alcoholic beverage fermentation industries, pharmaceutical manufacturers, mining laboratories and horticultural and forest nurseries involved in the cloning of plants.

Graduates in the **Food Processing Option** find employment in the food manufacturing industry, where they may perform chemical, physical and bacteriological tests on food materials during processing and on packaged goods, or they may supervise manufacturing processes within the plant. Other opportunities are found in government laboratories and inspection services.

Landscape Horticulture Option graduates are employed with landscape contractors, greenhouses, nurseries, parks and recreation systems, landscape architects and planners.

Prerequisite

Algebra 12 and Chemistry 11 are course requirements for the Biological Sciences Programs.

Faculty and Staff

J.T. Neilson, B.A.Sc., PEng., Acting Department Head
T. Akalehiyot, B.Sc., M.Sc., Ph.D.
R.S. Berry, B.S.A., PAg.
K.G. Cummings
J.T. Gillingham, B.S.A., M.Sc., Ph.D.
R.N.E. Hargreaves, Dipl.T., A.Sc.T.
R.N. Hitchman, B.S.A., PAg.
W. Hooge, B.S.A., PAg., Chief Instructor
V.J. Martens, B.S.A., M.Sc., PAg., Chief Instructor
J.H. Muir, B.S.A., PAg.
S.M. Murray, B.Sc. (Agr.), PAg.
B.E. Rothe
J.K. Soutter, H.D.F.T.



TECHNOLOGY: Biological Sciences PROGRAM: Landscape Horticulture

Level 1

	Cirm hrs/wk
BISC 102 Introductory Microbiology	6.0
BISC 103 Biology	5.0
CHEM 103 Applied Chemical Principles 1	6.0
MATH 144 Basic Technical Math	5.0
PHYS 102 Physics for Biological Sciences	5.0
TCOM 105 Technical Communication	3.0

Level 2

ADMN 110 Management	3.0
BISC 205 Introductory Botany and Soils	6.0
BISC 206 Horticulture 1	5.0
BLDG 117 Landscape Drafting	3.0
CHEM 217 Applied Chemical Principles	3.0
PHYS 202 Physics	5.0
SURV 125 Introduction to Survey	3.0
TCOM 205 Technical Communication	3.0

Level 3

BISC 306 Horticulture 2	6.0
BISC 310 Landscape Mechanics	5.0
BISC 311 Nursery Crop Production	6.0
BISC 312 Landscape Techniques	5.0
BISC 313 Advanced Plant Identification	3.0
BLDG 217 Landscape Drafting	3.0
TCOM 303 Advanced Technical Communication	2.0

Level 4

BISC 410 Plant Protection	6.0
BISC 411 Soil Technology	5.0
BISC 412 Landscape Techniques	6.0
BISC 413 Landscape Field Practices	6.0
BISC 414 Supervisory Practices	4.0
BISC 417 Silviculture and Forest Nurseries	4.0
CIVL 442 Land Engineering	3.0

PROGRAM: Food Processing

Level 1

BISC 102 Introductory Microbiology	6.0
BISC 103 Biology	5.0
CHEM 103 Applied Chemical Principles 1	6.0
MATH 144 Basic Technical Math	5.0
PHYS 102 Physics	5.0
TCOM 105 Technical Communication	3.0

Level 2

BISC 201 Food Processing	6.0
BISC 202 Microbiology for Food Processing	5.0
CHEM 203 Applied Chemical Principles 2	6.0
MATH 244 Statistics 1 and 2	5.0
PHYS 202 Physics	5.0
TCOM 205 Technical Communication	3.0

Level 3

BISC 301 Food Processing	5.0
BISC 302 Nutrition for Food Processing	2.0
BISC 303 Quality Control	4.0
BISC 304 Introductory Food Analysis	5.0
BISC 305 Mechanics of Machines	5.0
OPMT 163 Management Engineering 1	3.0
TCOM 303 Advanced Technical Communication	2.0

Level 4

ADMN 110 Management	2.0
BISC 401 Food Processing	5.0
BISC 402 Process Analysis	5.0
BISC 403 Quality Control	2.0
BISC 404 Food Analysis	5.0
BISC 405 Enzymatic Analysis	2.0
BISC 406 Sanitation	4.0
ELEC 253 Instrumentation for Biological Sciences	3.0
MATH 444 Introduction to Computing	2.0

PROGRAM: Bioengineering

Level 1 (Common with other Bio Science Programs)

BISC 102 Introductory Microbiology	6.0
BISC 103 Biology	5.0
CHEM 103 Applied Chemical Principles 1	6.0
MATH 144 Basic Technical Math and Microcomputer Applications	6.0
PHYS 102 Physics for Biological Sciences	5.0
TCOM 105 Technical Communication	3.0
	<hr/> 31.0

Level 2

BISC 220 Microbiology for Bioengineering	5.0
BISC 221 Fundamentals of Bioengineering	6.0
CHEM 203 Applied Chemical Principles 2	6.0
MATH 244 Statistics 1 and 2	5.0
PHYS 202 Physics	5.0
TCOM 205 Technical Communication	3.0
	<hr/> 30.0

The following courses are under development and subject to change:

Level 3

BISC 304 Food Analysis	5.0
BISC 320 Industrial Microbiology	5.0
BISC 321 Engineering Principles	4.0
BISC 322 Molecular Genetics	3.0
BISC 323 Economic Botany	3.0
BISC 324 Biochemistry	5.0
CHEM 311 Instrumental Analytical Methods	5.0
	<hr/> 30.0

Level 4

BISC 405 Enzymatic Analysis	2.0
BISC 420 Unit Operations for Bioengineering	5.0
BISC 422 Fermentation for Food and Energy	5.0
BISC 423 Genetic Engineering Techniques	4.0
BISC 424 Cell and Tissue Culture	4.0
BISC 425 Bioengineering Applications	6.0
BISC 427 Enzyme Technology	4.0
	<hr/> 30.0

Course Descriptions

ADMN 110 Management — Management is intended to give students an appreciation of the application of management principles and business techniques. Students are given an opportunity to develop their skills in using lecture material by analyzing typical business problems and proposing and discussing feasible problem solutions. Subjects covered include planning, organizing, leadership, control and financial management.

ADMN 340 Personnel Administration — An introduction to the fundamentals of personnel management including organization of the personnel function, salary administration, fringe benefits, training, management development and performance appraisal, constructive discipline, grievances and morale.

BISC 102 Introductory Microbiology — Designed to train students in the basic microbiological procedures employed in a laboratory: use and care of the microscope, staining methods, aseptic techniques, methods of identifying micro-organisms.

BISC 103 Biology — A study of the principles underlying living phenomena including the organizational attributes of living matter. Evolutionary development is traced from one-celled organisms to higher plants and animals. The economic importance of various classes of plants and animals is included.

BISC 201 Food Processing — An introduction to the principles and processes of canning, freezing, dehydrating and fermentation of foods. The use of salt, sugar and additives to preserve food. The importance of packaging of foods. Experimental portions of food will be preserved by various methods during lab periods. Prerequisite: BISC 102, CHEM 103.

BISC 202 Microbiology for Food Processing — The application of microbiology to food manufacturing. The isolation of micro-organisms significant to food processing for the purposes of differentiation and classification. Maintaining high bacteriological standards in processed foods. Shelf-life studies, spoilage control, food fermentations. Assessing microbiological test results and report writing to management. Prerequisite: BISC 102.

BISC 205 Introductory Botany and Soils — Plant morphology and physiology, with particular reference to ornamental and horticultural plants, soil types and introduction to soil testing. Culture and management of ornamental and recreational turf grass. Prerequisite: BISC 103.

BISC 206 Horticulture 1 — The principles of environmental control and plant response. Basic greenhouse and plant propagation techniques. Principles of plant taxonomy and nomenclature. Recognition and use of woody species found in the landscape. Prerequisite: BISC 103.

BISC 220 Microbiology for Bioengineering — The application of microbiology to biological and chemical engineering. Microbial physiology and the effect of environmental conditions. Characteristics and identification of molds, yeasts, and fungi of commercial significance. Prerequisite: BISC 102.

BISC 221 Fundamentals of Biotechnology — A survey of biotechnology. Organisms used. Genetic selection and manipulation. Types of processes involved. Ethics and legal implications. Prerequisite: BISC 103.

BISC 301 Food Processing — The study of food manufacturing processes in the fish, meat, fruit and vegetable, cereal, dairy, beverage and confectionery industries. Principles and techniques of proper handling and preservation of products in these industries will be emphasized. The use of ingredients such as

sweeteners, flavorings, coloring and preservatives will be discussed. Prerequisite: BISC 201.

BISC 302 Nutrition for Food Processing — A study of the nutrients found in food, their importance, metabolic function and dietary requirements. The selection of diets to meet varied nutritional needs. The relationship of nutrition and health. Nutritional labelling. The effect of processing on the nutritional quality of foods. Prerequisite: CHEM 103, CHEM 203.

BISC 303 Quality Control — An assessment of food quality. Responsibilities and organization of a quality control department in the food industry. Statistical procedures for sampling. Federal and provincial government regulations. An introduction to tristimulus colorimetry and measurement of color in foods. Prerequisite: MATH 244.

BISC 304 Introductory Food Analysis — An introduction to the theoretical and practical aspects of sampling and sample preparation. The proximate analysis of foods and biological materials. An introduction to carbohydrate and protein chemistry with selected analyses, using the best equipment available. Prerequisite: CHEM 103, CHEM 203.

BISC 305 Mechanics of Machines — Basic mechanical principles of food processing and bioengineering equipment including mechanical power transmission, electrical power, fluid systems and heat transfer. Materials of construction and equipment lubrication. The application of microcomputers to food processing and bioengineering systems. Prerequisite: PHYS 102, PHYS 202.

BISC 306 Horticulture 2 — Diverse methods of plant propagation are covered including seed collection, extraction and stratification. Seed bed preparation and growing media. Asexual propagation of selected species by cuttings, grafting and budding. Micropropagation and tissue culture. Hydroponic culture systems. Prerequisite: BISC 205, BISC 206.

BISC 310 Landscape Mechanics — A study of basic engineering principles as applied to landscape construction and maintenance equipment, irrigation and drainage systems, nursery and greenhouse systems. The application of microcomputers to landscape and greenhouse systems. Prerequisite: PHYS 102, PHYS 202.

BISC 311 Nursery Crop Production — Field and container culture of nursery plants. Nursery stock specifications. Site selection and layout. Growing structures and equipment. Prerequisite: BISC 103, BISC 206.

BISC 312 Landscape Techniques — History and principles of landscape design. Inventory of client requirements. Site analysis. Preparation of working drawings, bidding and contract documents. Prerequisite: BLDG 217.

BISC 313 Advanced Plant Identification — A continuation of the plant identification studies begun in Horticulture 1, with particular reference to the species and cultivar level. The use of plants in the landscape. Students must present a plant collection as part of the course requirement. Prerequisite: BISC 103, BISC 206.

BISC 320 Industrial Microbiology — The use of micro-organisms in mining, waste management, etc. Sanitation practices and requirements. The effect of viruses and phages on reaction. Prerequisite: BISC 220.

BISC 321 Engineering Principles — Fluid systems, heat transfer, electrical systems, product separation systems. Prerequisite: PHYS 202.

BISC 322 Molecular Genetics — Principles of genetics. Overview of Mendel's laws. Replication of genetic material. Cloning and recombinant DNA technology. Prerequisite: BISC 221.

BISC 323 Economic Botany — Plant environment and control. Plant processes and their manipulation. Application of various plant culture techniques with reference to representative crops. Prerequisite: BISC 103.

BISC 324 Biochemistry — The principles of biochemistry as found in cellular respiration, protein/lipid/steroid synthesis. Prerequisite: CHEM 203.

BISC 401 Food Processing — see BISC 301. Prerequisite: BISC 301.

BISC 402 Process Analysis — An analysis of the unit operations and equipment encountered in food processing. Operations involving raw and processed material are covered, as are plant systems including materials handling, waste management, plant layout and design, packaging equipment. Prerequisite: BISC 201, BISC 301, BISC 305.

BISC 403 Quality Control — The sensory evaluation of food; facility design, selection of taste panels; statistical analysis of data; laboratory measurement of consistency and texture of foods; recording and reporting with control charts; evolutionary operations. Prerequisite: BISC 303.

BISC 404 Food Analysis — An introduction to the chemistry of fats and oils. Practical laboratory analysis of lipids, vitamins and minerals using the latest equipment available. Prerequisite: BISC 304, CHEM 311.

BISC 405 Enzymatic Analysis — An introduction to the use of enzymes to perform determination of a variety of food constituents with great sensitivity and specificity. This is a relatively new and promising analytical tool. A high quality, ultra-violet spectrophotometer is used in this course. Prerequisite: BISC 304, CHEM 311.

BISC 406 Sanitation — Microbial aspects of industrial sanitation. Properties of good detergents and sanitizers. Government regulation. The use and storage of toxic materials. Approved water supply. Industrial practicums. Prerequisite: BISC 102, BISC 202.

BISC 410 Plant Protection — The morphology and identification of weeds, diseases and insects. Life histories of representative species. Strategy of control by cultural, biological and chemical means. Currently recommended pesticides are reviewed. Pesticide safety, pest and pesticide legislation. Students are examined under the provisions of the "Pesticides Control Act" for pesticide applicator and pesticide dispenser certificates. Prerequisite: BISC 103, CHEM 217.

BISC 411 Soil Technology — The origin, formation and classification of soils; use of survey reports, map interpretation. Components of soils, soil colloids, cation exchange, reactions, soil acidity, phosphorus, nitrogen, the crop as an indicator of fertility, soil organic matters, fertilizers. Soil sampling procedures, extraction methods used in soil analysis. Prerequisite: BISC 205.

BISC 412 Landscape Techniques — see BISC 312. Prerequisite: BISC 312.

BISC 413 Landscape Field Practices — Arboricultural techniques and practices. Pruning, transplanting, tree values, maintenance schedules. Prerequisite: BISC 306, BISC 312, BISC 313.

BISC 414 Supervisory Practices — This course provides an understanding of effective supervisory practices and of organizational behavior. Knowledge of labor laws, legal and tax information and government regulations is gained as well as management of resources for improved performance.

BISC 417 Silviculture and Forest Nurseries — An introduction to silviculture as practised in B.C., with emphasis on artificial regeneration of disturbed sites using planting stock. A review of stock types used in the regeneration process, their characteristics and methods of production and an analysis of the field conditions under which each might be used. Prerequisite: BISC 306, BISC 311.

BISC 420 Unit Operations for Bioengineering — Bioreactor design. Filtration and centrifugation. Solids and liquid handling. Instrumentation for process control. Waste treatment. Extraction methods. Prerequisite: BISC 321.

BISC 421 Enzyme Technology — Enzyme Kinetics and activation. Selection and purification of enzymes. Immobilized enzyme systems. Prerequisite: BISC 320.

BISC 422 Fermentation for Food and Energy — Traditional fermentation systems for alcoholic beverages, milk products, etc. The application of biotechnology to food fermentation systems. Prerequisite: BISC 320.

BISC 423 Genetic Engineering Techniques — Gene cloning and sequencing. Vector constructions. Automated peptides and nucleotides synthesis. Prerequisite: BISC 322.

BISC 424 Cell and Tissue Culture — Regeneration of intact plants from tissue cultures. Animal cell culture and the production of monoclonal antibodies. Prerequisite: BISC 221, 323.

BISC 425 Bioengineering Applications — Specific application of bioengineering techniques to the manufacture of products in the pharmaceutical, chemical, food and resource industries. Prerequisite: BISC 320, 321.

BLDG 117 Landscape Drafting — Fundamentals of drafting. Development of drafting skills using projects based on landscape structural details such as concrete slabs, steps, retaining walls and planters, as well as wood benches, fences and walls.

BLDG 217 Landscape Drafting — Continuation of BLDG 117. Further development of drafting skills using projects based on masonry, post and beam, and concrete deck construction.

CHEM 103 Applied Chemical Principles 1 — An introductory course of basic inorganic chemistry, topics include: chemical bonding, stoichiometry, formula writing, solution preparation, oxidation and reduction, acid-base theory, titration calculations and buffer solutions. Laboratory exercises consist of qualitative and quantitative analysis. Good laboratory techniques are emphasized.

CHEM 203 Applied Chemical Principles 2 — A continuation of CHEM 103. Topics include theory of gravimetric and volumetric analysis, simple physical chemistry and organic chemistry. Selected organic topics such as carbohydrates, fats and oils which are applicable to the bio-science technology are discussed in detail. Laboratory exercises consist of quantitative and qualitative analysis and organic separations. Prerequisite: CHEM 103.

CHEM 217 Applied Chemical Principles — A continuation of CHEM 103 with emphasis on application to landscape horticulture. Topics discussed include soil chemical structures, ion-exchange, PH, solubility and redox effects, soil amenders, fer-

tilizers and pesticides. Basic organic chemistry is introduced. Prerequisite: CHEM 103.

CHEM 311 Instrumental Analytical Methods — Deals with instrumentation used for chemical analysis. The theory, construction, application and operation of instrumentation is discussed. Instrumentation for the following is covered: potentiometry, polarography, refractometry, polarimetry, visible, ultra-violet, infra-red spectrophotometry, emission and absorption, flame photometry, gas and liquid chromatography. Laboratory exercises involve use of these instruments. Prerequisite: CHEM 203.

CIVL 442 Land Engineering — An introduction to the behavior of earth and land surfaces and engineering materials under various natural conditions. Included are foundation loads, settlements and bank stability of various soil types and the occurrence and flow of water under and above ground. By means of a project, the student learns to assess runoff flows through hydrological methods, designs a retaining dam for a recreational site complete with inlet and outlet flood-control structures, and estimates quantities for construction purposes.

ELEC 253 Instrumentation for Bio Sciences — An orientation course for the food processing option covering the principles and practices of instrumentation, measurement of pressure, level, temperature and flow, and an introduction to negative feedback and automatic control systems.

MATH 144 Basic Technical Mathematics — Exponential/logarithmic theory and transformations, common and natural logarithms, logarithmic/semilogarithmic graphs. Variation, straight line equation, curve fitting. Delta-process, the derivative, differentiation rules, curve sketching, applied maxima/minima, the differential, anti-derivatives, indefinite integral, definite integral with area under a curve. Introduction to computing using BASIC.

MATH 244 Statistics 1 and 2 — Organization and graphical presentation of data, frequency distributions and measures of central tendency, variation and other measures. Probability theory and laws. Random variables, discrete and continuous theoretical distributions. Sampling, estimation and hypothesis testing with both large and small samples. Method of least squares, regression and correlation including related estimation and hypothesis tests.

MATH 444 Introduction to Computing — BASIC formatted output, arrays, subroutines, plot routines and files. Spreadsheets and case study.

MKTG 419 Agricultural Product Marketing — An overview of marketing functions as used in all levels of food production and distribution.

OPMT 163 Management Engineering 1 — The techniques of management problem-solving and work simplification, with particular application to engineering and industrial organization. Includes method study, some measurement technique, layout, planning and scheduling. The course emphasizes practical applications to the field of biological sciences.

PHYS 102 Physics — An introductory level course covering a wide range of physical principles, with emphasis on areas of popular interest and special relevance to the biological sciences technology. Topics covered in first term include kinematics, dynamics, friction, statics, energy, power, circular motion, momentum, elasticity and fluid mechanics. Topics covered in second term include temperature, heat, calorimetry, kinetic theory, heat transfer, basic electricity and magnetism, colorimetry, optics relativity and radiation. Measurements, data analysis, experimental techniques and report writing are stressed.

PHYS 202 Physics — see PHYS 102.

SURV 125 Introduction to Survey — Introduction to the theory of engineering survey, practical application of linear measurements, introduction to and theory of the theodolite, bearings and traverse computations, introduction to and theory of levelling, computation of areas and volume.

TCOM 105 Technical Communication — In this course, students learn the fundamentals of oral and written communication demanded by industry; how to organize technical information and plan and present oral reports. They write instructions, process descriptions and several types of technical letters and memos.

TCOM 205 Technical Communication — In this course, students apply the skills learned in the first term to write resumes, job application letters and occurrence, incident, inspection, field trip, progress, recommendation, comparison, feasibility, performance appraisal and evaluation reports. Prerequisite: TCOM 105.

TCOM 303 Advanced Technical Communication — In this course, students practice typical kinds of engineering communication such as persuasive and technical letters, incident and trip reports, proposals and executive summaries. They update resumes and job application letters and learn how to participate in meetings. Prerequisite: TCOM 105, 205.

Building Technology

Spiralling advances in technology have increased the public's expectation of their communities and the buildings constructed within them. Structures are expected to be designed and constructed to rigorous standards of workmanship and safety while at the same time incorporating all the features which contribute to speed of erection, financial efficiency and user satisfaction. The construction industry is one of the major employment fields in Canada, turning over a large proportion of the total dollar volume of business in the country. These two factors, high public expectation of the industry and the dynamic nature of the industry, present both a challenge and an opportunity — attractive criteria for any career.

Job Opportunities

Since graduates have the advantage of understanding buildings from several perspectives — the architectural and structural elements; the mechanical, plumbing, drainage and electrical systems; the cost implications and the contractual and managerial processes — they will be able to fill technological positions which lie between the professional architect, engineer and contractor on the one hand, and the skilled tradesman on the other.

With experience, graduates of Building Technology become senior drafting personnel, job captains, specification writers, estimators or contracts managers, building inspectors, officials in property management departments, appraisers and assessors, partners in construction organizations and technical representatives for building supplies and equipment manufacturers. Many graduates will become estimators with general and sub-trade contractors, preparing bids and checking job costs and progress some. Instruction is also given in appraisal and assessment, leading to employment with public and private agencies. The growing field of Building Technology presents opportunities in consulting offices, assisting in design, specification writing and construction inspecting; with contractors, doing estimating, shop drawings and supervision; with suppliers, explaining the capabilities and application of equipment and systems.

The Program

The Building Technology program is designed to give both men and women a sound preparation for rewarding careers in many facets of the construction industry.

First year courses are common to all students and in addition to English, math and physics, include various basic technological subjects. Lecture instruction, drafting room practice and field trips are part of the program, and students are often able to further their education through summer jobs with architects, engineers, contractors or by doing inspection work for public and private agencies.

In their second year, students (subject to their demonstrated ability and departmental approval) will be placed in one of two specialized majors: Architectural and Economics. Information on these two electives is available from the Program Head.

The **Architectural Major** is primarily intended for those students who plan to work in architectural design and drafting offices. Subjects such as design, drafting, rendering techniques and graphics are studied to enhance expertise in this area.

The **Economics Major** is primarily intended for those students who plan to work in construction and project management offices. It is concerned with costing and the evaluation of property and construction, either in the drawing stage or already constructed.



Post-graduation

The Architectural Institute of British Columbia offers graduates credit for some of the examinations in their syllabus of studies for articulated students. The Canadian Institute of Quantity Surveyors will accept graduates as Probationer Members, and give credit in a similar manner. The Building Technology program is fully accredited by the Applied Science Technologists and Technicians of B.C. Information on these professional development possibilities is available from the Program Head.

Prerequisites

English 12, Algebra 12 plus Physics 11, all with C+ are course requirements for this program.

Faculty and Staff

R.I. McNeil, B.Surv., B.C.L.S., D.L.S., Dipl. Adult. Ed., P.Eng.,
Department Head
F.A.A. Alfeld, Dipl.Eng.
G. Berkenpas, Senior Instructor, 1st year
R. Guerin, A.Sc.T., Seminar Co-ordinator
D.C. Hale, Dipl.T.
G.M. Hardie, M.Ed., F.R.I.C.S., Program Head
H.E. Kuckein, M.A.I.B.C., M.R.A.I.C., Senior Instructor, 2nd year
J. Lancaster, B.Comm., M.C.I.Q.S.
A. Maharajh, B.A., Dipl.T., A.Sc.T., M.C.I.Q.S., Cont. Ed. Co-ordinator
J.A. McInnes, P.Eng., (on leave)
M. Stepler, Dipl.T., A.Sc.T., (on leave)
D.D. Workman
M. Kuzych, B.Arch., M.R.A.I.C., M.A.I.B.C.

TECHNOLOGY: Building

		Clim hrs/wk
Level 1		
BLDG 101	Drafting	4.0
BLDG 102	Building Construction 1.....	5.0
BLDG 103	Materials and Methods	4.0
BLDG 104	Construction Site Processes	3.0
BLDG 108	Introduction to Computers	2.0
CIVL 135	Building Structures 1.....	3.0
MATH 140	Basic Technical Mathematics	5.0
MSYS 101	Plumbing	3.0
TCOM 101	Technical Communication.....	4.0
Level 2 (Term 2A 10 weeks)		
BLDG 105	Construction Contracts 1.....	2.0
BLDG 201	Planning	4.0
BLDG 202	Building Construction 2.....	6.0
CIVL 236	Building Structures 2.....	3.0
MATH 240	Calculus and Analytic Geometry.....	5.0
MSYS 202	Heating and Ventilating 1	4.0
OPMT 185	Project Management	2.0
PHYS 219	Physics	4.0
Level 2 (Term 2B 10 weeks)		
BLDG 201	Planning	4.0
BLDG 202	Building Construction 2.....	6.0
BLDG 206	Construction Estimating 1	4.0
CIVL 236	Building Structures 2.....	3.0
ELEC 150	Illumination	3.0
MATH 240	Calculus 1 and 2 with Analytical Geometry.....	5.0
PHYS 219	Physics	4.0
TCOM 201	Technical Communication.....	3.0

PROGRAM: Architectural Major

Level 3		
BLDG 302	Building Construction 3 for Architectural Major 1.....	6.0
BLDG 306	Construction Estimating 2	4.0
BLDG 309	Architectural Major 1	6.0
CIVL 337	Building Structures 3.....	3.0
ELEC 250	Electrical Systems	4.0
OPMT 260	Management Engineering 1.....	2.0
PHYS 319	Physics	4.0
Level 4 (Term 2A 10 weeks)		
BLDG 305	Construction Specifications	2.0
BLDG 402	Construction 4 for Architectural Major 2 ...	6.0
BLDG 406	Construction Estimating 3	4.0
BLDG 409	Architectural Major 2.....	6.0
BLDG 413	Codes and Regulations.....	2.0
BLDG 419	Building Acoustics	3.0
CIVL 438	Building Structures 4.....	3.0
OPMT 360	Management Engineering 2.....	2.0
TCOM 301	Advanced Technical Communication	2.0
Level 4 (Term 2B 10 weeks)		
BLDG 205	Construction Contracts 2.....	2.0
BLDG 305	Construction Specifications	2.0
BLDG 402	Construction 4 for Architectural Major 2 ...	6.0
BLDG 406	Construction Estimating 3	4.0
BLDG 409	Architectural Major 2.....	6.0
CIVL 438	Building Structures 4.....	3.0
MECH 412	Space Conditioning.....	3.0
SURV 120	Introduction to Survey.....	3.0

PROGRAM: Economics Major

		Clim hrs/wk
Level 3		
BLDG 306	Construction Estimating 2	4.0
BLDG 312	Construction 3 for Economics 1.....	6.0
BLDG 316	Economics Major 1	6.0
CIVL 337	Building Structures 3.....	3.0
ELEC 250	Electrical Systems	4.0
OPMT 260	Management Engineering 1.....	2.0
PHYS 319	Physics	4.0
Level 4 (Term 2A 10 weeks)		
BLDG 412	Construction 4 for Economics 2.....	6.0
BLDG 416	Economics Major 2	6.0
CIVL 438	Building Structures 4.....	3.0
MATH 440	Mathematical Methods and Computing for Building	4.0
OPMT 360	Management Engineering 2.....	2.0
TCOM 301	Advanced Technical Communication	2.0
Level 4 (Term 2B 10 weeks)		
ADMN 311	Industrial Management	4.0
BLDG 205	Construction Contracts 2.....	2.0
BLDG 305	Construction Specifications	2.0
BLDG 406	Construction Estimating 3	4.0
BLDG 412	Construction 4 for Economics 2.....	6.0
BLDG 413	Codes and Regulations.....	2.0
BLDG 416	Economics Major 2	6.0
MECH 412	Space Conditioning.....	3.0
SURV 120	Introduction to Survey.....	3.0

Course Descriptions

ADMN 311 Industrial Management — Designed to give students an understanding of business management and an opportunity to apply principles and techniques through analysis of business case-problems.

BLDG 101 Drafting — Architectural drafting techniques and lettering. Drawing development with specific reference to office procedures and related design activities. Building standards for line development and graphics. Drawing process in terms of systemization and computerization.

BLDG 102 Building Construction 1 — Principles of building construction in terms of the assembly of materials. Examination of typical systems of wood and masonry construction. Study of architectural detailing and the origins and purposes of building and zoning by-laws. Application of the above components to the preparation of working drawings.

BLDG 103 Materials and Methods — Physical and chemical properties of common construction materials. Standards and gradings for materials. Construction methods and building procedures. Field studies and examination of sample products. Filing and retrieval of technical literature.

BLDG 104 Construction Site Processes — Job site management. Planning, implementation and control of site construction processes. Supervision of construction activities. Contractual relationships and documentation. Application of field studies to actual practice layouts.

BLDG 105 Construction Contracts 1 — Fundamentals of contracts. Parties to construction contracts. Basic types of construction contracts. Relationship between information and risk. Standard forms of construction contracts used in Canada and elsewhere. Appropriate documentation and related issues.

BLDG 108 Introduction to Computers — Computers as machines. Computers as management devices. Hardware and software defined. Aspects of programming, operating, and networking. Demonstrations of practical applications in building technology. Hands-on practice and research assignments related to the topic.

BLDG 201 Planning — Fundamentals of functional building design. Planning and organization of residential spaces. Design of simple utilitarian objects. Elementary architectural design problems and presentation techniques. Prerequisite: BLDG 101.

BLDG 202 Building Construction 2 — Continuation of BLDG 102. Prerequisite: BLDG 102.

BLDG 205 Construction Contracts 2 — Continuation of BLDG 105. Detailed examination of contents of current standard forms of Canadian construction contracts. Contractual procedures involving payments and adjustments. Application of principles to actual cases. Study of recent litigation involving construction contracts. Responsibilities for design and advice. Prerequisite: BLDG 105.

BLDG 206 Construction Estimating 1 — Introduction to general theories of measurement and pricing of construction work. Specific study of particular methods of measurement. Application to elementary examples of work. Introduction to bidding procedures and documentation. Sources of cost data. Introduction to computer applications for estimating. Prerequisite: BLDG 103.

BLDG 302 Building Construction 3 for Architectural Major 1 — Continuation of BLDG 202. Examination of typical systems of construction in heavy timber, steel and concrete. Site fabrication and assembly; prefabrication. Selection and location of materials in buildings. Extensive preparation of working drawings. Field trips to building sites and fabrication plants. Prerequisite: BLDG 202.

BLDG 305 Construction Specifications — Fundamentals of language as a means of communication. Style in specifications. Organization and presentation of information in construction contract documentation. Filing and retrieval of construction information using Masterformat. Preparation and reproduction procedures for production of project manuals. Use of word-processing equipment for specifications. Practical applications. Prerequisite: BLDG 103.

BLDG 306 Construction Estimating 2 — Continuation of BLDG 206. More detailed study and application of measurement and pricing of work of specific trades with emphasis on concrete work. Examination of CIQS Methods of Measurement of Construction Work. Prerequisite: BLDG 206.

BLDG 309 Architectural Major 1 — Short history of contemporary architecture and building. Conceptualization and planning. Theory, aesthetics and structure as integral parts of design. Prerequisite: Completion of first year program.

BLDG 312 Construction 3 for Economics 1 — Same as BLDG 302, but with less emphasis on drawing board skills and more emphasis on construction implementation procedures. Prerequisite: BLDG 202.

BLDG 316 Economics Major 1 — Principles of land development, use and title. Appraisal and assessment of property values for purchase, sale, taxation and other purposes. Techniques of analysis and synthesis of construction project costs. Sources of cost information and data. Prerequisite: Completion of first year program.

BLDG 402 Construction 4 for Architectural Major 2 — Continuation of BLDG 302, for Architectural Major. Prerequisite: BLDG 302.

BLDG 406 Construction Estimating 3 — Continuation of BLDG 306. Measurement and unit pricing of specific construction trades. Preparation of estimate summaries and bids or proposals to owners or clients. Construction cost accounting. Documentation used in estimating and cost accounting processes. Bid strategies, bid depositories, bid procedures in general. Prerequisite: BLDG 306.

BLDG 409 Architectural Major 2 — Continuation of BLDG 309. Graphics and freehand drawing of architectural subject matter. Advanced perspective drawing in a variety of media. Architectural model making. Extensive seminar discussions, guest lecturers and field trips. Prerequisite: BLDG 309.

BLDG 412 Construction 4 for Economics 2 — Continuation of BLDG 312, for Economics Major. Prerequisite: BLDG 312.

BLDG 413 Codes and Regulations — Building Law in Canada. A general survey of codes and regulations affecting design and construction, including zoning and professional practice. Specific study of the National Building Code, with particular reference to use and occupancy, and the control of fire hazards. Prerequisite: BLDG 302 or BLDG 312.

BLDG 416 Economics Major 2 — Continuation of BLDG 316. Financial management; contract management. Cost accounting and budget control methods. Bid strategies and procedures. Development of feasibility studies. Presentation of reports on construction economic affairs and jobsite controls. Techniques of costing, pricing and analysis of economic data. Prerequisite: BLDG 316.

BLDG 419 Building Acoustics — Theory and principles of sound, including properties, propagation, sources and measurement techniques. Noise criteria and control of noise in buildings. Selection of materials having appropriate acoustical and aesthetic qualities for buildings. Calculations encountered in acoustical considerations. Prerequisite: BLDG 302 and 309.

CIVL 135 Building Structures 1 — Basic theory of statics including the calculation of loads acting on structures, and the calculation of support reactions and internal axial and shear forces and bending moments due to the applied loads. Students will be expected to analyse simple trusses and plot shear and bending moment diagrams for beams. This course lays the groundwork for subsequent courses in strength of materials and elementary structural design, and is presented in lectures followed by tutorial problem solving sessions.

CIVL 236 Building Structures 2 — The link between statics and design, this course concentrates initially on various types of stress, including shear, bending and buckling stresses. Investigation of properties of sections, shear forces, bending moments, deflections, loads, methods of framing and site visits, allow for analysis of existing buildings and use of the timber design manual. Prerequisite: CIVL 135.

CIVL 337 Building Structures 3 — The emphasis in this course is placed on elementary structural design concepts for timber, steel and reinforced concrete structures. Students are familiarized with design aids such as handbooks, manuals, catalogues and tables used in the construction industry. Architectural students study primarily timber structures, including concrete formwork design. All other students study a more condensed course including timber, steel and concrete. Concepts such as lateral stability and resistance to wind and earthquake forces are included. Prerequisite: CIVL 236.

CIVL 438 Building Structures 4 — Architectural students study elementary reinforced concrete design including an appreciation of its variations, such as prestressed concrete and reinforced masonry, followed by an introduction to soils engineering including compaction, foundation systems and retaining walls. All other students take a shorter course including bolted and welded connections of steel members, a condensed version of the soils engineering mentioned above, and an introduction to concrete formwork design. Prerequisite: CIVL 337.

ELEC 150 Illumination — Deals with the types and characteristics of lighting sources; quantity and quality of light; lighting units, terminology and calculations.

ELEC 250 Electrical Systems — Students learn how to plan the electrical system for a specific building, with the electrical designer. How to read and work with common electrical drawings and specifications, understand single and three-phase systems, and power factor correction for minimal operations costs; recognize and avoid building designs that create costly electrical design problems. Prerequisite: ELEC 150.

MATH 140 Basic Technical Mathematics — Quadratic equation and systems of linear equations. Radian measure. Trigonometric functions, solution of triangles, and vectors. Irregular areas and volumes. Exponential/logarithmic theory and transformations, common and natural logarithms, and logarithmic/semilogarithmic graphs. Variation, straight line equation, and curve fitting. Linear programming.

MATH 240 Calculus 1 and 2 with Analytic Geometry — Conic sections and polar/rectangular transformations. Limits, the derivative, differentiation rules for algebraic, trigonometric, logarithmic and exponential functions, curve sketching, implicit differentiation, higher order derivatives, applied maxima/minima, related rates and differentials. Antidifferentiation, the indefinite integral and the definite integral including area, volume, centroid and moment of inertia.

MATH 440 Mathematical Methods and Computing — BASIC arithmetic and functions, input/output statements, relational operators, branching statements, strings and arrays. Linear programming using the simplex method and the transportation problem. Cost estimating computer case study.

MECH 412 Space Conditioning — The student will study and analyze factors influencing indoor comfort, including building solar orientation, evaluation of cooling loads, properties of air, air-conditioning processes, and gain an overview of air conditioning methods.

MSYS 101 Plumbing — Topics include codes, basic engineering principles and graphic presentations related to plumbing systems design, load calculations, piping methods, sizing of system components for storm and sanitary drainage and water distribution. Some drafting skill will be required.

MSYS 202 Heating and Ventilating 1 — Covers the principles involved with heat loss in buildings and practises of heating and ventilating encompassing a study of system components and design procedures. These will then be applied to the preparation of heat loss calculations and working drawings for a heating/ventilating system.

OPMT 185 Project Management — An introduction to the fundamentals of Critical Path Method (CPM) as it applies to project planning, scheduling and control, and project management. The course includes arrow, precedence and time logic diagrams; resource allocation, time cost analysis and the role of the computer.

OPMT 260 Management Engineering 1 — Applies the systematic problem-solving and decision-making approach to construction industry problems. The course includes computerized facilities planning; work study, using recognized method study techniques to examine and improve the way in which a job is accomplished; recognized work measurement techniques for estimating, planning and cost control and engineering economics.

OPMT 360 Management Engineering 2 — Techniques of work innovation and management problem-solving. Goal setting, agreement creation, work measurement and documentation. Uses computer software for project management with emphasis on the manager's perspective.

PHYS 219 Physics — A general physics course designed to meet the specific needs of the Building Technology. There is a lab component. Topics include: mechanics — statics, kinematics, dynamics, work and energy, basic machines; electricity and magnetism — electrostatics, basic circuits, electromagnetic effects; electric motors; matter — solids, liquids and gases, hydrostatics, fluid flow; heat and thermodynamics — change of state, heat transfer, heat engines, energy sources; wave and simple harmonic motion — mechanical and acoustical vibrations.

PHYS 319 Physics — A general physics course designed to meet the specific needs of the Building Technology. There is a lab component. Topics include: mechanics — statics, kinematics, dynamics, work and energy, basic machines; electricity and magnetism — electrostatics, basic circuits, electromagnetic effects; electric motors; matter — solids, liquids and gases, hydrostatics, fluid flow; heat and thermodynamics — change of state, heat transfer, heat engines, energy sources; wave and simple harmonic motion — mechanical and acoustical vibrations.

SURV 120 Introduction to Survey — An introduction to engineering survey; linear distance; the theory and use of theodolite; direction, bearing and angles; use of traverses in site engineering; elevations, use and theory of the level, how to use the plane table.

TCOM 101 Technical Communication — In this course students learn the basic techniques and applications of written and spoken communication. Assignments are related as closely as possible to the practical careers of Building Technology students, including direct and persuasive requests, informational memos, job application letters and resumes.

TCOM 201 Technical Communication — In this applied communication course students learn the theory and practice writing different types of short reports based on industry-related case studies. They learn report formats and write occurrence, trip progress, investigation and recommendation reports. Prerequisite: TCOM 101.

TCOM 301 Advanced Technical Communication — In this course, students concentrate on two problems of particular relevance to second-year students — obtaining employment and writing presentations. They update their job search packages and write proposals, follow-up letters, progress reports, a formal technical report and give an oral technical briefing. Prerequisite: TCOM 101, TCOM 201.

Chemical Sciences Technology

Chemical principles and processes form the base of modern industrial society. Whether in the research laboratory or industrial chemical plant, the chemical analyst and chemical process technologist are in great demand. Their skills find challenges on many fronts, including solving environmental pollution problems. Because chemical principles are so universally used, graduates of the Chemical Sciences program find employment in almost every major industrial and research activity in B.C.

Job Opportunities

Graduates are employed as chemists and analysts in research facilities and commercial and industrial labs; engineering assistants in consulting firms; production supervisor trainees in production plants; analysts in environmental and chemical laboratories; assayers or mineral processing technicians in extractive metallurgy plants; process technologists in pulp mills and as materials testing and non-destructive testing specialists.

The Program

The Chemical Sciences Program offers the student grounding in general science and technology courses in the first year of studies, with the opportunity for specialization in second year.

The first year curriculum emphasizes applied chemistry, general laboratory procedures and testing, and introduces the student to a wide range of industrial chemical processes.

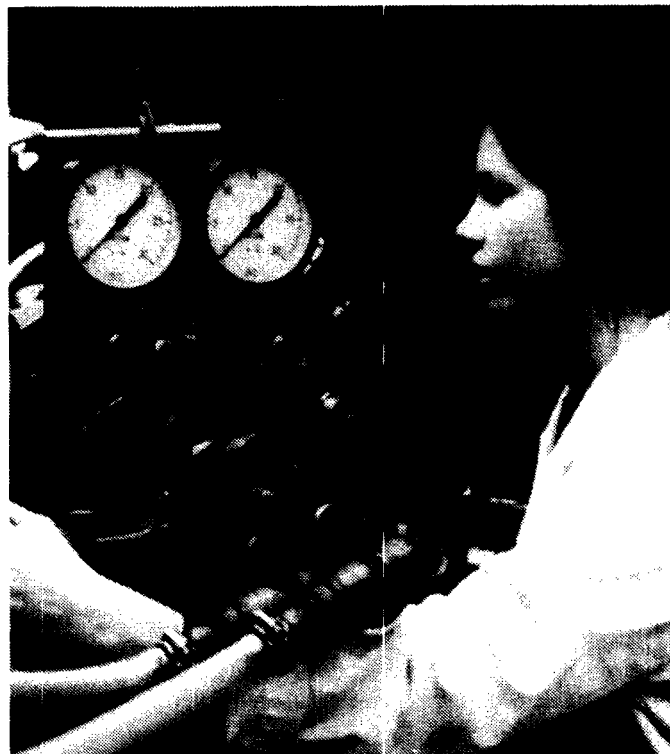
In the second year, Analytical Chemistry, Unit Operations and Unit projects are compulsory throughout, while most other courses are chosen on an elective basis, depending on which technology the student wishes to specialize in. The following programs are offered: **Industrial Chemistry, Laboratory Chemistry, Environmental Science and Pollution Control, Pulp and Paper, Extractive Metallurgy, Physical Metallurgy.**

Prerequisites

Chemistry 11 and Algebra 12 are course requirements for this program.

Faculty and Staff

J.T. Neilson, B.A.Sc., P.Eng., Acting Department Head
S. Berghold
J. Berry, B.Sc., Ph.D.
W.J. Bogoy, B.C.L.Ass., Senior Instructor
R. Drouin, Dipl.T.
W.R. Irvine, B.A., M.Sc., P.Eng., Program Head
D.J. McLeod, A.R.M.T.C., A.I.M.
T. Malakoff, Dipl.T.
G.A. Smook, B.S., P.Eng.
T. Voksepp, B.A.Sc., P.Eng.



PROGRAM: Chemical Sciences

	Cirm hrs/wk
Level 1	
CHEM 101 Applied Chemical Principles 1	6.0
CHSC 103 Engineering Materials	3.5
CHSC 119 Environmental Science	4.5
MATH 141 Basic Technical Mathematics	5.0
MECH 103 Drafting Fundamentals	3.0
PHYS 114 Physics	5.0
TCOM 102 Technical Communication	3.0
Level 2	
CHEM 201 Applied Chemical Principles 2	6.0
CHEM 204 Chemical Laboratory Techniques	3.0
CHSC 202 Laboratory Workshop	1.5
CHSC 203 Engineering Materials	3.5
CHSC 246 Industrial Chemical Processes	3.0
MATH 241 Statistics 1 and Calculus 1	5.0
PHYS 214 Physics	5.0
TCOM 202 Technical Communication	3.0
Level 3 Common	
CHEM 310 Physical Chemistry	5.0
CHEM 314 Analytical Chemistry 1	6.0
CHSC 320 Unit Project	2.0
CHSC 341 Unit Operations	6.0
MATH 341 Numerical Methods with BASIC	5.0

	Clim hrs/wk
Electives	
CHEM 309 Organic Chemistry.....	6.0
CHSC 304 Physical Metallurgy.....	6.0
CHSC 307 Extractive Metallurgy.....	6.0
CHSC 311 Pollution Science and Organic Chemistry.	6.0
CHSC 346 Pulp and Paper.....	6.0
Level 4 Common	
CHEM 414 Analytical Chemistry 2.....	6.0
CHSC 420 Unit Project.....	3.0
CHSC 441 Unit Operations.....	6.0
Elective 1	
CHEM 409 Organic Chemistry for Chemical Science 2.....	6.0
CHSC 404 Physical Metallurgy.....	6.0
CHSC 407 Extractive Metallurgy.....	6.0
CHSC 411 Pollution Science and Microbiology.....	6.0
CHSC 446 Pulp and Paper.....	6.0
Elective 2	
CHSC 408 Ore Analysis.....	3.0
CHSC 412 Waste Management.....	3.0
Elective 3	
CHSC 413 Environmental Analytical Methods.....	3.0
NGAS 403 Process Dynamics.....	3.0
Elective 4	
CHEM 416 Analytical Instrumentation 1.....	2.0
ELEC 254 Process Measurements.....	2.0
Elective 5	
CHSC 438 Coal Chemistry.....	2.0
CHSC 448 Industrial Chemistry.....	2.0
MATH 441 Calculus 2 and Differential Equations.....	2.0

Course Descriptions

CHEM 101 Applied Chemical Principles 1 — Provides the necessary background for chemical calculations and analysis. Included are stoichiometry, atomic structure, bonding, solution preparation and acid-base and oxidation-reduction reactions and titrations. Simple chemical equilibrium leads to a good working knowledge of pH, buffer solutions, solubility product, selective precipitation and industrial processes involving equilibria. Lab work consists of simple qualitative and quantitative analysis and good lab technique is taught.

CHEM 201 Applied Chemical Principles 2 — A continuation of CHEM 101 giving detailed coverage of gravimetric and volumetric analysis and qualitative analysis of cations and anions. Electrochemistry includes cells, electroplating and corrosion. Simple physical chemistry provides theory of solids, liquids and gases leading to fractional distillation and colligative properties. The Periodic Table is used to correlate many properties of elements and compounds. Names and properties of some organic compounds are covered and lab work covers qualitative and quantitative analysis and physio-chemical separations.

CHEM 204 Chemical Laboratory Techniques — This course teaches basic techniques in sampling, weighing, moisture determination, ashing, extractions, filtration gravimetric methods and volumetric methods. Emphasis is placed on the separation of unwanted components of natural samples. Instrumental analysis and separation methods will be described, demonstrated and, whenever possible, practised.

CHEM 309 Organic Chemistry — Organic compounds are classified according to functional groups. Naming using IUPAC, common names and trade names of many industrial chemicals. Factors affecting boiling point and solubility, theory of extraction. Preparation and reactions of alkanes, alkenes, aromatics, alcohol. Petroleum refining, addition polymerisation, synthetic rubber. Theory of infrared spectroscopy, interpretation of spectra.

CHEM 310 Physical Chemistry — Presents the kinetic theory of gases, the first and second laws of thermodynamics, phase equilibria, chemical kinetics and catalysis. Lab work consolidates lecture material and gives experience in practical physio-chemical measurements.

CHEM 314 Analytical Chemistry 1 — The course covers the theory and practice of conventional methods of inorganic analysis and includes methods of sample decomposition, sampling, treatment of analytical data, precipitation and complex formation titration, solvent extraction and ion exchange methods, and fire assaying. Laboratory exercises include the ore analysis for iron, chromium, tin, copper, arsenic, zinc, sulphur and silica, as well as fire assaying for gold and silver.

CHEM 409 Organic Chemistry for Chemical Science 2 — A general course covering properties, preparations and reactions of all major classes of organic compounds—aliphatic and aromatic hydrocarbons, halides, alcohols, ethers, carboxylic acids and their derivatives, aldehydes, ketones, amines, amino acids, carbohydrates, heterocyclics, dyes and polymers. Lab work emphasizes organic techniques, qualitative chemical analysis and instrumental methods, infra-red, ultraviolet and gas chromatography.

CHEM 414 Analytical Chemistry 2 — Introduces the basic principles of analytical instruments and their application to a variety of analyses. Major topics include analytical absorption methods (visible, ultraviolet, infrared and atomic absorption), emission methods (flame, spectrographic, ICP), x-ray fluorescence and diffraction methods, chromatographic methods (gas and HPLC), electrochemical methods (PH, specific ion, polarography) and trace analysis (electrothermal atomization, hydride generation, etc.).

CHEM 416 Analytical Instrumentation 1 — Covers the construction of electrodes and the use of operational amplifiers in the following analytical methods: constant current coulometric titration, amperometric, potentiometric and polarographic methods. Phototransducers and photometric circuits.

CHSC 103 Engineering Materials — Physical testing of materials including metals, plastics, wood and wood products, concrete, ceramics and soils. Non-destructive testing. Microscopy, photomicrography and photography.

CHSC 119 Environmental Science — An introductory course in environmental chemistry and pollution control. The course examines the major air and water pollutants, including measurement techniques and engineering control methods. Laboratory sessions cover sampling methods now used by industry in B.C.

CHSC 202 Laboratory Workshop — Instruction in basic workshop techniques including glass blowing, soldering, brazing and gas welding. Use of hand and bench tools.

CHSC 203 Engineering Materials — Continuation of CHSC 103.

CHSC 246 Industrial Chemical Processes — A description of the chemical processes involved in major industrial chemical plants in B.C. Emphasis is placed on chemical operations associated with the pulp and paper industry, the mineral processing

industry and other B.C. chemical process industries. Lab sessions involve the testing and control procedures utilized in industrial applications.

CHSC 304 Physical Metallurgy — Solidification of metals, casting methods and defects, metal-forming operations, phase diagrams, alloying of metals, heat-treatment. Lab sessions emphasize physical testing of materials, metallography and non-destructive testing.

CHSC 307 Extractive Metallurgy — Is concerned with the unit operations of coal and nonferrous metals recovery and upgrading, and with the unit processes of nonferrous and previous metal recovery from ores and concentrates. Mineral processing covers the basic operations of comminution, particle size analysis, classification, screening, flotation, gravity separation. Extractive metallurgy covers the fundamental principles and processes of hydrometallurgy, pyrometallurgy and electrometallurgy. Solutions to design and operating problems are emphasized.

CHSC 311 Pollution Science and Organic Chemistry — An introduction to organic chemistry, with applications to industrial pollution problems.

CHSC 320 Unit Project — Projects relating to the student's chosen specialty are assigned each term. Regular progress reports and a final term report are required. Industrial and laboratory training is emphasized.

CHSC 341 Unit Operations — First and second law of thermodynamics; enthalpy, entropy, phase rule, thermodynamic diagrams and tables; properties of steam; fluid flow and measurement in pipes and channels, piping, pipe fittings and valves; flow of heat, conduction, convection, radiation, film and overall transfer co-efficients, heat exchangers; principles and application of equipment for evaporation, distillation, absorption, extraction; humidification and dehumidification; drying; solid-liquid and liquid-liquid extraction.

CHSC 346 Pulp and Paper — Pulp and paper technology is concerned with mechanical and kraft pulping, chemical and heat recovery, bleaching, papermaking, newsprint manufacture, process control and product testing. The lab portion of this course is designed to equip students with basic testing skills and provide "hands-on" experience with typical mill unit operations. Projects are undertaken in term 4 to involve students in planning and carrying out practical project work.

CHSC 404 Physical Metallurgy — A continuation of CHSC 304.

CHSC 408 Ore Analysis — A survey of analytical methods to determine the elemental constituents of ores, concentrates, alloys and metal products. Laboratory work includes principles and practice of gravimetric, volumetric, complexometric and spectrophotometric methods of analysis.

CHSC 411 Pollution Science and Microbiology — Discusses air pollution meteorology, air pollution chemistry, air sampling methods, classical and instrumental techniques for measuring atmospheric and indoor contaminants (e.g. hydrogen sulfide, mercaptan, sulfur oxides, carbon monoxide, ozone, nitrogen oxides, various organic contaminants and lead, mercury, cadmium and zinc in air, etc.), particulate counting and sizing, stack sampling and some of the principles and techniques used in water pollution microbiology. Laboratory sessions include standard methods used by industrial and government laboratories.

CHSC 412 Waste Management — Physical, biological and chemical methods used in treating municipal and industrial waste

waters. The major industrial techniques for control of air pollutants are also discussed.

CHSC 413 Environmental Analytical Methods — Surveys suitable methods of examining many types of water, waste water and materials related to control of water quality. Typical industrial pollution problems related to local industry are discussed during lab periods and special attention is given to proper sampling techniques. A selection is made from the following analysis of field samples; cyanide, pesticides, arsenic, mercury, nitrogen (ammonia, nitrate, organic), oxygen (D.O., B.O.D., C.O.D.), surfactants, phosphates, sulphates, chlorides, proteins, carbohydrates, lignins, phenols and heavy metals.

CHSC 420 Unit Project — see CHSC 320.

CHSC 438 Coal Chemistry — An introduction to coal chemistry with emphasis on coal preparation and coal testing techniques.

CHSC 441 Unit Operations — see CHSC 341.

CHSC 446 Pulp and Paper -See CHSC 346.

CHSC 448 Industrial Chemistry — A survey course covering the major chemical process industries. Lecture material is selected from the following topics; chlorine and caustic production, aluminum production, petroleum refining, metal refining, plastics, phenol and resins, material and energy balances.

ELEC 254 Process Measurements — An orientation course with emphasis on lab exposure to industrial equipment. Standard methods of applying commercial instruments to measure pressure, level flow and temperature variables are included. The course ends with an introduction to the principles of regulators and controllers.

MATH 141 Basic Technical Mathematics for Chemical Sciences — Graphical linear programming. Exponential/logarithmic theory and transformations, common and natural logarithms and logarithmic/semilogarithmic graphs. Radian measure. Trigonometric functions of any angle, vectors and solution of triangles, graphs of trigonometric functions, identities, compound and double angle formulas, trigonometric equations, and inverse functions.

MATH 241 Statistics 1 and Calculus 1 for Chemical Science — Organization and graphical presentation of data, frequency distributions, measures of central tendency and variation, probability theory, random variables, theoretical distributions, sampling and estimation. Delta-process, the derivative, differentiation rules, implicit differentiation, related rates and applied maxima/minima. The indefinite and definite integrals with applications. Trapezoidal and Simpson's rules for numerical integration. Related rate problems with functions of several variables.

MATH 341 Numerical Method with BASIC for Chemical Sciences — BASIC arithmetic and functions, input/output statements, relational operations, branching statements, formatted output, strings, arrays, and files. Gauss-Jordan method applied to the solution of systems of linear equations, solution of algebraic and transcendental equations by iterative methods, linear programming using the simplex method.

MATH 441 Calculus 2 and Differential Equations for Chemical Sciences — Differentiation and integration of logarithmic and exponential functions with applications. Tables of integrals. Differential equations including variables separable and linear first order with applications. Computer application of Euler's, Heun's and Runge-Kutta's methods for solving differential equations.

MECH 103 Drafting Fundamentals — An introductory course for persons with little or no experience in graphics. (Students are required to purchase drafting equipment and supplies on the first night of class.) Students learn to produce and read simple drawings. Topics include scales, geometric constructions, basic orthographics detail interpretation, line visibility, dimensioning, auxiliary views, true shape, inclined and skew surfaces, sections, pictorials, working drawings and freehand sketches.

NGAS 403 Process Dynamics — Introduces a practical and effective computer based approach for studying and evaluating 'real time' process control situations. The student is required to produce interim progress reports during the course and a final, formal technical report at the end of the course. Topics include: system dynamics, response time, control strategies, system optimization, system modelling, flow charting, transducer and control valve evaluation.

PHYS 114 Physics for Chemical Sciences — An introductory level course covering kinematics, dynamics, function, statics, angular motion, energy, momentum, simple machines, properties of matter, fluid mechanics, temperature and heat, thermal properties of matter, basic electricity and magnetism, wave motion and sound, electromagnetic waves, optics, atomic and nuclear phenomena. The lab program stresses measurement, data analysis, experimental technique and report writing. Mathematical treatment requires algebra and trigonometry.

PHYS 214 Physics for Chemical Sciences — See PHYS 114.

TCOM 102 Technical Communication for Chemical Sciences — Introduces students to the techniques and tools used in communicating technical information to people in industry. Students will practice basic skills, learn to analyze information and design an information package — letter, memo proposal or report — for industrial audiences.

TCOM 202 Technical Communication for Chemical Sciences — Students will write a resume and job application letter, and prepare for job interviews. They will do library research, write several short reports, give an oral report, and practice effective meeting strategies and telephone techniques. Prerequisite: TCOM 102.

Non-Destructive Testing and Quality Assurance Technology

Post-diploma Program

This is a one year program leading to a Diploma of Technology. The program emphasizes non-destructive testing, quality control, and quality assurance concepts and techniques.

Graduates will be equipped to work as quality assurance technologists in a wide variety of light and heavy manufacturing industries.

Prerequisite

BCIT Diploma of Technology in an Engineering Program or Operations Management, or a two year college Diploma in Science, or a Bachelor's Degree in Science or Engineering.

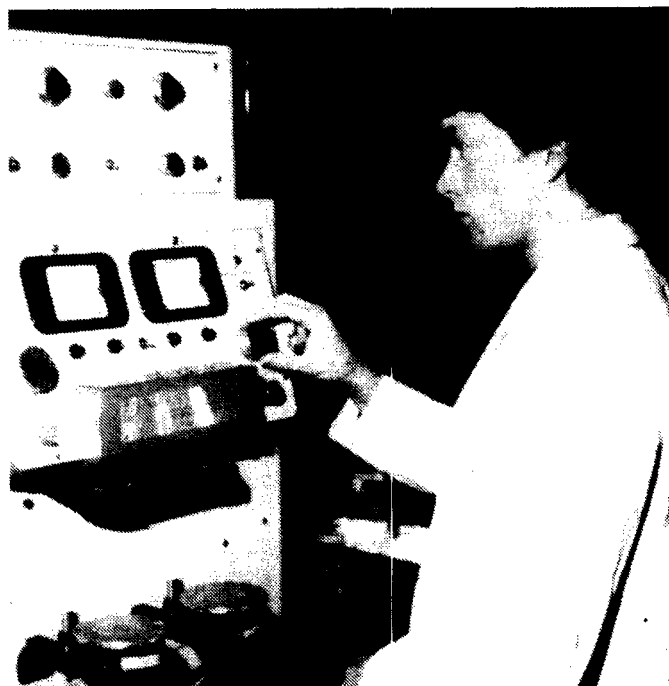
Faculty and Staff

J.T.Neilson, B.A.Sc., P.Eng., Acting Department Head
J. Lloyd, P.Eng.
D. McLeod, A.R.M.T.C., M.I.M.
W. Irvine, B.A., M.Sc., P.Eng
R. Pike

PROGRAM: Non-Destructive Testing and Quality Assurance

Level 1	Cirm hrs/wk	
CHSC 169/269 NDT Radiography	6.0	
CHSC 172 NDT Magnetic Particle/Liquid Penetrant...	3.0	
CHSC 304 Physical Metallurgy	6.0	
MECH 304 Manufacturing Processes 3	4.0	
OPMT 136 Quality Assurance	5.0	
Level 2	Term 4A	Term 4B
CHSC 170/270 NDT Ultrasonics	8.0	0.0
CHSC 171 NDT Eddy Current	0.0	3.0
CHSC 173 Strain Gauging/Advanced NDT Methods	0.0	3.0
MATH 449 Quality Control Statistics	5.0	5.0
MECH 414 Metrology	4.0	4.0
OPMT 236 Quality Assurance	5.0	0.0
Elective:		
CHSC 421 NDT Project	0.0	7.0
OPMT 336 Quality assurance Project	0.0	7.0

(Note: The above program is tentative and may be altered before being presented for the first time in September 1987.)



Course Descriptions

CHSC 169 NDT: Radiography Level 1 — Covers the general principles of radiography — nature of penetrating radiation, the interaction between penetrating radiation and matter, radiation sources, detection and measurement of radiation, radiation safety and darkroom procedures. Students learn the proper selection of a radiation source for a given application, film type, screens, etc., and should be able to perform radiographic examinations according to prescribed techniques. The course meets the requirements for classroom training as stipulated in CGSB Standard 48-BP-4M, condition (b).

CHSC 170 NDT: Ultrasonics Level 1 — Combines theory with practice, using a variety of ultrasonic testing equipment and test samples to cover generation of ultrasound. Instrumentation, frequency, velocity, wavelength, attenuation, calibration, reference standards, longitudinal, transverse and surface waves, reflection, Snell's Law, sensitivity and resolution. Meets the requirements of CGSB Standard 48-GP-7M condition (b) for classroom training.

CHSC 171 NDT: Eddy Current — Covers basic concepts of induced current, characteristics of induced eddy current, factors affecting conductivity, permeability and hysteresis, coil characteristics, impedance method-balanced bridge, signal to noise ratio, readout mechanisms, phase analysis, modulation analysis, methods and applications of eddy current testing, relationship of indications to discontinuities, advantages and limitations of the method, probe arrangement design and manufacture. Meets classroom training requirements as stipulated in CGSB Standard 48-CP-13M for levels 1 and 2.

CHSC 172 NDT: Magnetic Particle and Liquid Penetrant — Covers theory of magnetism and magnetic properties of materials; comparison with other NDT methods; current characteristics; direct and indirect induction: residual and continuous methods; black light — principles and requirements; dry vs. wet method; indicating the mediums; material controls and calibration; discontinuities — their causes and detectability; demagnetization; inspection, interpretation and evaluation of indications. Meets CGSB Standard 48-GP-8M and 9M condition (b) level 1 and 2.

CHSC 173 NDT: Strain Gauge and Acoustic Emission — Includes reviews of the theory and applications of electrical resistance strain gauges and acoustic emission techniques.

CHSC 269 NDT: Radiography Level 2 — Meets the requirements of CGSB Standard 48-GP-4M, condition (b) for classroom training. The course includes a review of radiation theory, physical principles, radiation sources, detection and safety. Topics include the radiographic process, miscellaneous applications, test result interpretation, material considerations, codes standards, specifications and procedures. Prerequisite: CHSC 169 or be a certified level 1 radiographer.

CHSC 270 NDT: Ultrasonics Level 2 — Meets the requirements of CGSB Standard 48-GP-7M, condition (b) for classroom training. The course includes a review of the theory of ultrasonic testing and its practical applications. Emphasis will be on the operation of special equipment, applications requiring specific testing procedures and the consideration of variables affecting test results. Prerequisite: CHSC 170 or be a certified level 1 operator.

CHSC 304 Physical Metallurgy — Metallurgy — iron and steel-making processes, solidification of metals and alloys, operations, casting methods and defects, foundry technology, metal forming, review of phase diagrams for binary alloy systems, isothermal transformations in steels, heat-treating techniques, non-ferrous metals and alloys and welding metallurgy. Lectures and field trips to industrial plants are supplemented by lab sessions which emphasize physical testing of materials, metallography and service failure investigation.

CHSC 421 NDT Project — The student will be expected to work on special NDT projects either in laboratory facilities at BCIT or in a local industry.

MATH 449 Quality Control Statistics

MECH 304 Manufacturing Processes 3 — In this course the student makes a detailed study of processes such as casting hot and cold forming, extruding, forging, stamping, pressing and material joining, including machines and materials. Quantities/costs will be investigated. Manufacturing processes recently introduced will be discussed in oral presentations by the student. Visits to local industries will be arranged.

MECH 414 Metrology

OPMT 136 Quality Assurance 1 — Basic principles of Quality Assurance and their application in manufacturing. Topics include: technical concepts of quality and reliability; the role of inspection and test in the overall quality program; quality planning; production processes and quality; inspection operations and statistical inspection methods; supplier quality assurance; the impact of codes and standards.

OPMT 236 Quality Assurance 2 — Continues from OPMT 136. Topics include: the economic aspect of quality costs and productivity; the concept of a total quality control system; quality data reporting and corrective action procedures; quality system functions and documentation; employee involvement and quality circles; legal liability for product quality; meeting the requirements of the CSA Z299 Canadian National Standards for Quality Assurance.

OPMT 336 Quality Assurance Project — An industry-based study under faculty supervision. The course is designed to give the student an opportunity to work in a quality assurance department in local industry on a special project by arrangement with the organization Quality Manager.

Civil and Structural Technology

Civil and Structural technologists are involved in the design and construction of highways, bridges, airports, railways, municipal works, power developments, dams, canals, docks and harbors. The field has enormous creative potential and offers the technologist involvement in all phases of a project, from design stage to finished job.

Job Opportunities

Graduates find employment as inspectors, construction supervisors, testing lab technicians, design detailers and investigation and construction technologists in government and in private industry. A number of graduates have founded their own consulting or construction businesses. Others are placed in engineering, contracting, surveying or architectural firms as project managers or supervisors, or to work in design or analysis. These jobs usually entail an equal amount of time spent outdoors as indoors. Fieldwork usually takes place from spring to fall.

The Program

The diverse and stimulating program includes field trips to assist students in developing their creativity, ingenuity and critical abilities, as well as major projects in which the student develops, in consultation with professionals, appropriate methods of approach and solution. In the second year, students may choose their options to provide a degree of specialization in varying areas of the civil or structural technology. These include Geotechnical, Highways Traffic, Water Resources, Construction and Structures.

The program has been accredited at the technologist level by the Applied Science Technologists and Technicians of B.C. and, upon completion of the BCIT diploma program, graduates are eligible for membership in the Society.

Prerequisites

Algebra 12 and Physics 11 are course requirements for this program. Applicants should be skilled in the use of the English language, have good mathematical ability and be interested in the physical sciences. Drawing or sketching ability is useful.

Exemption from the academic requirements may be made in the case of mature applicants with applicable practical experience.

Transfer

Graduates of the Civil and Structural Program with a sufficiently high standing are granted full credit for their work at BCIT by the University of Lakehead Civil Engineering Department. After taking summer school they are then eligible to enter fourth year engineering directly and graduate with an accredited degree in two years. Students with a high academic standing also obtain good transfer credits to other Canadian Universities such as the University of Waterloo and the University of Calgary.



Faculty and Staff

R.I. McNeil, B.Surv., B.C.L.S., Dipl. Adult Ed., P.Eng., Department Head
T. Abbuhl, Dipl.T., A.Sc.T.
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B. Samson, B.A.Sc., M.A.Sc.
R.C. Starr, B.Eng., M.A.Sc., P.Eng. Chief Instructor
C.E. Wade, B.Sc., M.I.T.E., P.Eng., on leave

TECHNOLOGY: Civil and Structural

		Cirm hrs/wk
Level 1		
CIVL 101	Statics.....	6.0
CIVL 103	Hydrology	3.0
CIVL 109	Construction Materials 1	3.0
MATH 142	Basic Technical Math	5.0
MECH 101	Drafting Fundamentals	2.0
PHYS 107	Physics	5.0
SURV 130	Survey.....	3.0
TCOM 103	Technical Communication.....	3.0

Level 2 (Term 2A 10 weeks)		
CIVL 202	Strength of Materials	6.0
CIVL 207	Hydraulics 1	3.0
CIVL 211	Civil Computer Applications 1	3.0
MATH 242	Calculus 1 and 2	5.0
MECH 202	Drafting	2.0
PHYS 207	Physics	5.0
SURV 230	Survey.....	3.0
TCOM 203	Technical Communication.....	3.0

Level 2 (Term 2B 10 weeks)		
CIVL 203	Elementary Structural Design	6.0
CIVL 207	Hydraulics 1	3.0
CIVL 211	Civil Computer Applications.....	3.0
MATH 242	Calculus 1 and 2	5.0
MECH 202	Drafting	2.0
PHYS 207	Physics	5.0
SURV 230	Survey.....	3.0
TCOM 203	Technical Communication.....	3.0

PROGRAM: Geotechnical and Highways/ Traffic

Level 3		
CIVL 304	Structural Design General	6.0
CIVL 308	Hydraulics 2	3.0
CIVL 313	Subdivision Planning and Street Design...	6.0
CIVL 325	Soil Mechanics 1	6.0
CIVL 383	CADD for Civil and Structural.....	3.0
MATH 342	Matrix Methods	4.0
SURV 330	Survey for Civil and Structural.....	3.0
TCOM 302	Advanced Technical Communication	2.0

Level 4 (Term 2A 10 weeks)		
CIVL 412	Municipal Services.....	6.0
CIVL 426	Soil Mechanics 2	6.0
CIVL 432	Construction Estimating.....	3.0
MATH 442	Statistics for Civil and Structural	4.0
OPMT 180	Construction Management 1	3.0
PHOT 127	Photo Interpretation	3.0
SURV 430	Survey for Civil and Structural.....	3.0
TCOM 401	Advanced Technical Communication	2.0

Level 4 (Term 2B 10 weeks)		
CIVL 410	Construction Materials 2	3.0
CIVL 417	Highway Design	6.0
CIVL 427	Soil Mechanics 3	6.0
CIVL 436	Construction Planning	3.0
MATH 442	Statistics for Civil and Structural	4.0
PHOT 127	Photo Interpretation	3.0
SURV 430	Survey for Civil and Structural.....	3.0
TCOM 401	Advanced Technical Communication	2.0

PROGRAM: Water Resources

		Cirm hrs/wk
Level 3		
CIVL 304	Structural Design General	6.0
CIVL 308	Hydraulics 2	3.0
CIVL 313	Subdivision Planning and Street Design...	6.0
CIVL 325	Soil Mechanics 1	6.0
CIVL 383	CADD for Civil and Structural.....	3.0
MATH 342	Matrix Methods	3.0
SURV 330	Survey for Civil and Structural.....	3.0
TCOM 302	Advanced Technical Communication	2.0

Level 4 (Term 4A 10 weeks)		
CIVL 412	Municipal Services.....	6.0
CIVL 416	Water Resources.....	3.0
CIVL 426	Soil Mechanics 2	6.0
CIVL 432	Construction Estimating	3.0
MATH 442	Statistics.....	4.0
OPMT 180	Construction Management 1	3.0
SURV 430	Survey for Civil and Structural.....	3.0
TCOM 401	Advanced Technical Communication	2.0

Level 4 (Term 4B 10 weeks)		
CIVL 410	Construction Materials 2	3.0
CIVL 416	Water Resources.....	3.0
CIVL 417	Highway Design	6.0
CIVL 436	Construction Planning	3.0
MATH 442	Statistics for Civil and Structural	4.0
OPMT 280	Construction Management 2	3.0
PHOT 127	Photo Interpretation	3.0
SURV 430	Survey for Civil and Structural.....	3.0
TCOM 401	Advanced Technical Communication	2.0

PROGRAM: Construction

Level 3		
CIVL 304	Structural Design General	6.0
CIVL 308	Hydraulics 2	3.0
CIVL 313	Subdivision Planning and Street Design...	6.0
CIVL 417	Highway Design	6.0
CIVL 383	CADD for Civil and Structural.....	3.0
MATH 342	Matrix Methods	3.0
SURV 330	Survey for Civil and Structural.....	3.0
TCOM 302	Advanced Technical Communication	2.0

Level 4 (Term 4A 10 weeks)		
CIVL 325	Soil Mechanics 1	6.0
CIVL 412	Municipal Services.....	6.0
CIVL 423	Structures 2	6.0
MATH 442	Statistics for Civil and Structural	4.0
OPMT 180	Construction Management 1	3.0
SURV 430	Survey for Civil and Structural.....	3.0
TCOM 401	Advanced Technical Communication	2.0

Level 4 (Term 4B 10 weeks)		
CIVL 410	Construction Materials 2	3.0
CIVL 426	Soil Mechanics 2	6.0
CIVL 432	Construction Estimating	3.0
CIVL 433	Construction Detailing	3.0
CIVL 436	Construction Planning	3.0
MATH 442	Statistics for Civil and Structural	4.0
OPMT 280	Construction Management 2	3.0
SURV 430	Survey for Civil and Structural.....	3.0
TCOM 401	Advanced Technical Communication	2.0

PROGRAM: Structures

		Cirm hrs/wk
Level 3		
CIVL 308	Hydraulics 2	3.0
CIVL 313	Subdivision Planning and Street Design...	6.0
CIVL 322	Structures 1	6.0
CIVL 417	Highway Design	6.0
CIVL 383	CADD fir Civil and Structural.....	3.0
MATH 342	Matrix Methods	3.0
SURV 330	Survey.....	3.0
TCOM 302	Advanced Technical Communication	2.0
Level 4 (Term 4A 10 weeks)		
CIVL 325	Soil Mechanics 1	6.0
CIVL 423	Structures 2	6.0
CIVL 432	Construction Estimating	3.0
CIVL 434	Structural Detailing	3.0
MATH 442	Statistics for Civil and Structural.....	4.0
OPMT 180	Construction Management 1	3.0
SURV 430	Survey for Civil and Structural.....	3.0
TCOM 401	Advanced Technical Communication	2.0
Level 4 (Term 4B 10 weeks)		
CIVL 410	Construction Materials 2	3.0
CIVL 424	Structures 3	6.0
CIVL 426	Soil Mechanics 2.....	6.0
CIVL 436	Construction Planning	3.0
MATH 442	Statistics for Civil and Structural.....	4.0
OPMT 280	Construction Management 2.....	3.0
SURV 430	Survey for Civil and Structural.....	3.0
TCOM 401	Advanced Technical Communication	2.0

Course Descriptions

CIVL 101 Statics — Vectors, force systems, graphical analysis, resultants, components, moments, equilibrium laws, force polygons, funicular polygons, frames and trusses, stress diagrams, Bowes' notation, flexible tension members, load shear and bending moment curves. Closely supervised problem sessions are used to provide the student with practice in common analytical and graphical solutions to problems of static load on statically determinate structures.

CIVL 103 Hydrology — This introductory course presents the basic concepts and techniques of small watershed analysis and the type of work involved in the design, supervision and construction of drainage facilities. The course will present the fundamentals of practical hydrology including: the hydrologic cycle; precipitation types and measurement; snowmelt, runoff and streamflow; basic frequency analysis and open channel flow. Lectures, assigned problems, and two design projects will be used to demonstrate the principles involved.

CIVL 109 Construction Materials 1 — Introduces the fundamentals of construction materials — concrete, asphalt, and aggregates. Students learn to perform basic tests on these materials in accordance with established standards and recommended industry laboratory procedures. In addition, students learn to sample, inspect and test these materials under civil project conditions.

CIVL 202 Strength of Materials — Simple stresses; stress, strain, elasticity; compound bars and columns; temperature stress; elastic limit, limit of proportionality; yield; ultimate; factor of safety; load factor; ductility; resilience; fatigue; shock. Properties of sections; bending moments; shear forces; theory of flexure; slopes and deflection of beams; restrained and continuous beams. Strut theories; eccentric loading, lateral loading. Testing techniques; machines; extensometers; strain gauges;

brittle lacquers; photo elasticity; evaluation of results. Prerequisite: CIVL 101.

CIVL 203 Elementary Structural Design — Having previously studied forces and material properties, students learn to apply these to the analysis of real structures. They also study the effects of wind, snow and earthquake loads as determined by national standards. Design and analysis of steel and timber beams, columns and trusses and their connections are used as examples. Prerequisite: CIVL 202.

CIVL 207 Hydraulics 1 — Through problem sessions and lectures, the student learns to determine the hydrostatic forces exerted by water on a variety of structures, gates, tanks and dams. As part of a project, the student analyzes a complex tank full of water to determine the forces and centres of pressure. Special problems of hydrostatic pressures produced in accelerated or rotated fluids are given. Further problem sessions lead to the understanding of energy transfers and losses in pipe systems and the significance of friction losses in waterworks systems. In this part of the course, the student analyzes a simple pump-driven circulation system and graphs all energy gradients in profile along the system. Evaluation is by individual interview, problems and quizzes.

CIVL 211 Civil Computer Applications — BASIC language commands, statements, line numbers variables, string variables, expressions, input/output logic including algebra employing arrays, built in functions, subroutines, random access and sequential access files, screen graphics. Projects using BASIC; FORTRAN compared to BASIC; mainframe file editing/printing using CMS/VM spreadsheets; word processing data bases. Highway terminology — horizontal/vertical curves. Introduction to Canadian standards.

CIVL 304 Structural Design General — Designed for students taking Civil options. Through analysis and design projects, students are introduced to reinforced concrete as a structural material. The effects of continuity with structures are discussed in lectures and connection details for all structural components in basic building materials are developed. Prerequisite: CIVL 203.

CIVL 308 Hydraulics 2 — Lectures and assignments on open and closed channel flow including distribution of flow pipe networks, water-hammer, and stresses in pipes. Hydraulic element chart and specific energy in open channel and culvert flow. Prerequisite: CIVL 207.

CIVL 313 Subdivision Planning and Street Design — Through this introduction to the physical layout of urbanization, the student learns to systematically subdivide a piece of land in accordance with recommended standards using imagination and creativity. Design a major street to recommended standards including geometrics, elevation tables, catch basin locations and rotation of crown; and to design a minor street complete with intersection, curb returns and appropriate drainage. The topic is viewed from the range of planner, engineer, developer, consumer and resident, and the knowledge could be used working for a developer, municipal planner or engineer, or a consulting engineer or contractor. This course offers the opportunity to make decisions and to actually design a civil works project. Briefs are produced and there is exposure to designing an office environment as well. Prerequisite: CIVL 206.

CIVL 322 Structures 1 — Heavy emphasis is placed on statically indeterminate structures in this, the first of three second year structures courses. In addition to determining the design criteria for continuous beams and frames by the use of moment distribution, reinforced concrete designs for one way slabs, continuous beams and columns, as well as retaining walls, are

investigated. The designs are "drafted" and "reinforced" with site visits. Prerequisite: CIVL 203.

CIVL 325 Soil Mechanics 1 — Through lectures and laboratory work the principles of basic soil mechanics and soil testing are covered. Topics include mass/volume relationships, soil classification, compaction, geology, subsurface investigation, permeability and pressure diagrams, effective stress, consolidation, shear strength.

CIVL 383 CADD for Civil and Structural — (1) Basic CADD commands for controlling elements, views, drawings and files. (2) Project using above knowledge/skills to produce civil/structural drawing and hard copy thereof. (3) Project to make a modified version of drawing as in (2) with radical changes utilizing power of CADD system. (4) Project to utilize data from above drawing for design and quantities take off. Prerequisite: CIVL 211.

CIVL 410 Construction Materials 2 — Introduction to the design of Portland cement and asphaltic concrete as materials. Students learn to design concrete to specified strength and perform Marshall design on asphalt. The course also includes an introduction to cement chemistry and manufacturing, non-destructive testing and statistical analysis of concrete; the analysis and interpretation of Marshall designs of asphalt. Inspection techniques for construction material in general and specific emphasis on inspection procedures, reporting and safety for civil engineering will be covered in this course. As per CIVL 417 with additional topics relevant to highway structures such as bridge abutments, multiplate culverts, etc. Prerequisite: CIVL 109.

CIVL 412 Municipal Services — Students plan a residential subdivision for a piece of accessible raw land and design an arterial street bordering the subdivision and specific minor streets and intersections within the subdivision. The instructor acts as supervisor and consultant to students. Lectures on the basics of neighborhood planning and on design standards and methods are given as needed. The plan includes the waterworks distribution system, sanitary sewers and storm sewers and their design with full plans and profile drawings for each service. Through preparatory lectures and discussions, the student is introduced to municipal road standards, crown and drainage, street geometry, street appurtenances, paving methods, domestic fire and industrial water demands, water distribution design methods, distribution reservoirs and pressure control, pumping, sewer flows and sewer design, sewage pumping stations and loads on buried conduits. Field trips are made to municipal operations. Prerequisite: CIVL 207, CIVL 206.

CIVL 416 Water Resources — Lectures and problem sessions present the analysis of surface runoff by the rational formula and unit hydrograph, mass curves for water supply storage, flood routing and detention storage. The use of the computer in predicting water resources and quality (mathematics modelling) is covered. Prerequisite: CIVL 207 or CIVL 105.

CIVL 417 Highway Design — Students will complete the preliminary design of a section of rural highway in B.C. Working in groups, students will establish curve radii, spiral lengths, curve data, stations, curve superelevation, superelevation development, centre line profile, vertical curve lengths, typical section details, drainage details, culvert sizes. Using an earthwork computer program students will optimize earthworks by manipulating input files on vertical alignment, typical section and superelevation and by analysis of resulting mass haul. Preliminary working drawings will also be prepared. Prerequisite: CIVL 206, CIVL 207, CIVL 211.

CIVL 423 Structures 2 — Through analysis and design projects, students continue to achieve appreciation and understand-

ing of structures. Emphasis is placed on computer aided structural analysis and design, and on formwork design. Students will acquire the ability to present calculations, sketches and drawings in a clear, concise, professional manner, and to solve problems within a specified time limit. A field trip to inspect a structure under construction is included. Prerequisite: CIVL 322.

CIVL 424 Structures 3 — An existing bridge is chosen in consultation with the instructor, and the student designs, aligns and details an alternative crossing to the original. The student learns about layout, moving loads, influence lines, continuous girders, trusses, arches, deflections of spans, bridge deck floor systems, sway bracing, deck slabs, joint details, piers and abutments and piling. Prerequisite: CIVL 423.

CIVL 426 Soil Mechanics 2 — This course applies the knowledge learnt in CIVL 325 to a variety of geotechnical, foundation and drainage design problems. Projects include seepage studies and stability analysis of soil slopes, earth pressures and retaining structures, foundation design. Prerequisite: CIVL 325.

CIVL 427 Soil Mechanics 3 — Lectures, laboratory and project work and guest lectures cover the following topics: geotechnical aspects of tailings dam design, construction and maintenance; triaxial soil testing; maintenance and operation of laboratory/field electronic equipment; reinforced earth; elementary rock mechanics. Prerequisite: CIVL 426.

CIVL 432 Construction Estimating — The student is involved in construction estimate preparation both as an individual and as a member of a team. Lectures illustrate the procedures for taking off quantities, establishing productivity forecasts and unit costs, and accounting and job control methods.

CIVL 433 Construction Detailing — Introduction to the practical aspects of taking-off, fabrication, and the placing and inspecting of reinforcing steel in concrete structures. Field trips to fabricating plants and construction sites augment classroom instruction.

CIVL 434 Structural Detailing — Students are required to design and detail connections, and draw solutions to detailing problems taken from structures used in other related courses, i.e. timber, steel and reinforced concrete. Includes bill of materials and reinforcing bar lists.

CIVL 436 Construction Planning — Introduction to the time-value of money and the application of sound economic principles to comparison of construction alternatives and acquisition and maintenance of equipment. A major construction project is analyzed by the student emphasizing critical path planning and the optimum use of resources. Planning for construction projects involving repetitive operations is demonstrated by worked examples. Construction industry guests lecture on current projects and the responsibility of the technologist.

MATH 142 Basic Technical Mathematics for Civil and Structural — Quadratic equation and systems of linear equations. Radian measure. Trigonometric functions, solution of triangles, and vectors. Irregular areas and volumes. Exponential/logarithmic theory and transformations, common and natural logarithms, and logarithmic/semilogarithmic graphs. Variation, straight line equation, and curve fitting. Linear programming.

MATH 242 Calculus 1 and 2 for Civil and Structural — Conic sections and polar/rectangular transformations. Limits, the derivative, differentiation rules for algebraic, trigonometric, logarithmic and exponential functions; curve sketching, implicit differentiation, higher order derivatives, applied maxima/minima, related rates and differentials. Antidifferentiation, the indefinite

integral and the definite integral including area, volume, centroid and moment of inertia.

MATH 342 Matrix Methods for Civil and Structural — Matrix theory and operations, types of matrices, determinants, matrix inversion, elementary matrix transformations and solution of systems of linear equations. Linear programming using the Simplex method. Network analysis.

MATH 442 Statistics for Civil and Structural — Organization and graphical presentation of data, frequency distributions and measures of central tendency, variation and other measures. Probability theory and laws. Random variables, discrete and continuous theoretical distributions. Sampling, estimation and hypothesis testing with both large and small samples. Method of least squares and regression and correlation. Time series analysis. Control chart concepts and application, acceptance sampling.

MECH 101 Drafting Fundamentals — An introductory course for persons with little or no experience in graphics. (Students are required to purchase drafting equipment and supplies on the first night of class) Students learn to produce and read simple drawings. Topics include scales, geometric constructions, basic orthographics detail interpretation, line visibility, dimensioning, auxiliary views, true shape, inclined and skew surfaces, sections, pictorials, working drawings and freehand sketches.

MECH 202 Drafting (Civil and Structural) — Intersections, developments, descriptive geometry, contours, sections, profiles, cut and fill problems. All treated generally on a project basis with civil and structural design procedures.

OPMT 180 Construction Management 1 — An introduction to the fundamentals of the Critical Path Method (CPM) as it applies to project planning, scheduling, control and management. This course includes arrow diagrams, precedence diagrams, resource allocation, time-cost analysis, PERT, bid determination, project management and the role of the computer. The course is designed to meet the needs of the civil engineering student.

OPMT 280 Construction Management 2 — The study of problem-solving in industry, with particular emphasis on heavy construction and manufacturing problems. The course includes method study, process charting, activity sampling, work measurement, motion economy and productivity. Special emphasis is placed on the human problems associated with change. The course is particularly slanted towards civil engineering.

PHOT 127 Photo Interpretation — Civil and Structural — Covers the fundamentals of aerial photo interpretation, basic photo interpretation equipment, geologic and soil mapping, air photo interpretation for terrain evaluation, engineering applications of aerial photo interpretation including site evaluation and route location. The fundamentals of photogrammetry and the applications of photogrammetric equipment to highway engineering are also covered.

PHYS 107 Physics for Civil and Structural — This is a general level physics course emphasizing the application of physical principles to the Civil and Structural Technology. A section on the application of geophysical exploration techniques used in the technology is included. Topics covered include statics, kinematics, dynamics, energy and power, angular motion, thermal properties of matter, fluid mechanics, wave motion and waves in elastic media, basic electricity and magnetism, instrumentation, optics and atomic and nuclear phenomena. The lab program stresses measurements, data analysis and experimental techniques.

PHYS 207 Physics for Civil and Structural — see PHYS 107.

SURV 130 Surveying — Civil and Structural — Fundamental concepts of surveying; measurement of distances, use of compasses, theodolites, plane tables, levels and chains, site surveys. Calculations relating to traverses, triangulations, areas and volumes; obtaining, recording and plotting topographic detail. Care, maintenance and adjustment of equipment.

SURV 230 Surveying — Civil and Structural — see SURV 130.

SURV 330 Surveying — Civil and Structural — see SURV 130.

SURV 430 Surveying — Civil and Structural — see SURV 130.

TCOM 103 Technical Communication for Civil and Structural — In this course students practice basic writing and word processing skills, and write inquiry, complaint and adjustment letters. They also write several short, technical memos and give an oral report. Assignments and materials are taken from the civil and structural field.

TCOM 203 Technical Communication for Civil and Structural — Students will write job application letters and resumes and learn about job interviews. They write short progress, incident, trip reports and inspection reports common to the Civil and Structural field. They also practice oral reporting. Prerequisite: TCOM 103.

TCOM 302 Advanced Technical Communication for Civil and Structural — Students analyze and write problem-solving, analytical and recommendation reports typical of the civil engineering field. They also learn small group communication theory, write management letters, organize staff and site meetings and participate in role-plays. Prerequisite: TCOM 103, TCOM 203.

TCOM 401 Advanced Technical Communication for Civil and Structural — In this course, students continue practicing advanced communication skills such as using word processing to write specifications, how to handle complaints on the telephone, persuasive presentations and technical proposals. The focus of the course is on selling engineering ideas. Prerequisite: TCOM 103, TCOM 203, TCOM 302.

Forest Resource Technology

British Columbia's greatest renewable natural resource is its forest land. The benefits that derive from the intelligently planned use of this forest land are many, varied and extremely valuable to the people of this province. The wise use of the land and related resources is essential for the continued survival of many industries, as well as for the perpetuation of the resources themselves. The Forest Resource Technology has been established in an endeavor to meet the above needs and offers training in two options: **Forestry** and **Fish, Wildlife and Recreation**.

Job Opportunities

Graduates in the Forestry Option find employment in a variety of industrial and government positions.

The job opportunities for graduates in Fish, Wildlife and Recreation are principally in government agencies and, because of the limited number of jobs, the number of students is restricted.

The Program

Forestry covers forest engineering, logging systems and production, fire control, forest management, forest measurements, silviculture, photo interpretation and mapping, botany and soils, forest utilization and ecology.

Fish, Wildlife and Recreation covers the management of fish, wildlife and wildland recreation and includes habitat ecology, environmental inventory techniques and law enforcement with respect to the above-mentioned resources. The Program is accredited at the Technologist level by the Applied Science Technologists and Technicians of B.C.

Prerequisites

*The following are minimum requirements: Algebra 11 (C+ average); a Science 11 (for F.W.R. option must be Biology 11); any one of another science 11, or a science or algebra 12. Work experience in natural resources strengthens an application for either of the options. *Out of province and mature student applications will be reviewed by the Department Head.

Expenses

In addition to tuition fees, books, supplies and equipment, students will incur expenses for field trips and a first-aid course. These expenses may be as much as \$500 for first year and \$600 for second year.

Faculty and Staff

W.R. Cannon, B.A. Acting Department Head

N.E. Alexander, M.P.M.

M.R. Angelo, B.S.F., M.F.

D. Campbell, Dipl.T.

F. Cassetta, B.Sc.F., R.P.F.

C.W. Chestnut, B.A., Ph.D. (on leave)

T.D. Chisholm, B.Ed.

E.C. Crossin, B.S.F., M.S.I., R.P.F.

C.J. Diebold, C.A.M., C.Tech

D. Guthrie, B.Sc., M.Sc., Ph.D.

D.C. Holmes, B.A.Sc., M.F., R.P.F., PEng., Chief Instructor

E.W. Howard, B.S.F., M.F., Cert. Inst.

A.G. Jakoy, B.S.F., M.Sc., R.P.F., Chief Instructor

R. Kley, Dipl.T.

H. Lynum, B.A.Sc., R.P.F.



D.H. MacLaurin, B.Sc.F., R.P.F.

R.W. Reisen, Dipl.T., E.T.I., A.Sc.T.

G. Rosberg, B.Sc., Dipl.T.

N. Shaw, Dipl.T., A.Sc.T.

J. Simpson, B.Sc.F., M.Sc.

B. Sivak, B.S.F., M.F., Ph.D., R.P.F. (on leave)

P. Willms, Dipl.T.

P. Yanciw, B.A.Sc.

TECHNOLOGY: Forest Resource PROGRAM: Forestry

		Clim hrs/wk
Level 1		
FSTR 101	Natural Resource Measurements.....	5.0
FSTR 103	Plant Identification	5.0
FSTR 104	Photo Interpretation and Mapping 1	4.0
FSTR 105	Fire Management 1.....	3.0
FSTR 108	Introduction to B.C. Natural Resources	4.0
MATH 145	Basic Technical Mathematics for Forest Resources	6.0
TCOM 106	Technical Communication.....	3.0
Level 2		
FSTR 201	Forest Measurement 1.....	8.0
FSTR 202	Introduction to Soils	4.0
FSTR 203	Ecology	5.0
FSTR 204	Photo Interpretation and Mapping 2	4.0
FSTR 206	Microcomputer Applications.....	3.0
FSTR 208	Integrated Resource Project	*40.0
MATH 245	Mathematics for Forest Resources	4.0
TCOM 206	Technical Communication.....	3.0

* a one-week course

Level 3		
FSTR 301	Forest Measurement 2.....	6.0
FSTR 302	Timber Harvesting	5.0
FSTR 303	Roads and Transportation 1	6.0
FSTR 304	Forest Pestology.....	4.0
FSTR 305	Silviculture 1.....	4.0
FSTR 311	Summer Technical Report	1.0
FSTR 326	Forest Management	4.0
TCOM 304	Advanced Technical Communication	2.0

Level 4		Clim hrs/wk
FSTR 401	Log Scaling	4.0
FSTR 402	Log Production and Cost Control	4.0
FSTR 403	Roads and Transportation 2	5.0
FSTR 404	Forest Pestology	4.0
FSTR 405	Silviculture 2	5.0
FSTR 413	Independent Studies	3.0
FSTR 415	Fire Management 2	1.0
FSTR 426	Forest Administration	4.0
TCOM 402	Advanced Technical Communication	2.0

PROGRAM: Fish, Wildlife and Recreation

Level 1		
BISC 104	Zoology	5.0
FSTR 101	Natural Resource Measurements	5.0
FSTR 103	Plant Identification	5.0
FSTR 104	Photo Interpretation and Mapping 1	4.0
FSTR 108	Introduction to B.C. Natural Resources	4.0
MATH 154	Basic Technical Mathematics for FWR	4.0
TCOM 209	Technical Communication	4.0

Level 2		
FSTR 202	Introduction to Soils	4.0
FSTR 203	Ecology	5.0
FSTR 204	Photo Interpretation and Mapping 2	4.0
FSTR 206	Microcomputer Applications	3.0
FSTR 207	Introduction to Fish, Wildlife and Recreation	4.0
FSTR 208	Integrated Resource Project	*40.0
MATH 254	Statistics for FWR	6.0
TCOM 308	Advanced Technical Communication	4.0

* a one week course

Level 3		
FSTR 307	Recreational Land Management	7.0
FSTR 308	Wildlife Management	7.0
FSTR 309	Fish Management 1	6.0
FSTR 310	Projects	6.0
FSTR 311	Summer Technical Report	1.0
FSTR 312	Environmental Law Enforcement	3.0
TCOM 304	Advanced Technical Communication	2.0

Level 4		
FSTR 407	Recreational Land Management	7.0
FSTR 408	Wildlife Management	7.0
FSTR 409	Fish Management 2	7.0
FSTR 410	Projects	5.0
FSTR 413	Independent Studies	3.0
FSTR 416	Natural Resource Administration	3.0
TCOM 406	Public Information Techniques	3.0

Course Descriptions

BISC 104 Zoology — General classification of the animal kingdom. Basic vertebrate zoology. The development of the vertebrate from embryo to adult. The study of the vertebrate body, including the skeletal, muscular, digestive, circulatory, urogenital and endocrine systems.

FSTR 101 Natural Resource Measurements — Concepts of field measurement and basic surveying. Includes field note-taking, traverse calculations and plotting, sketching of topographic detail, horizontal and vertical error corrections, differential levelling of roads and streams, latitude and departure calculations of traverses, map assembly field notes, lake volume and area measurements, and sampling for population estimates. Emphasis is on field labs with supporting lectures.

FSTR 103 Plant Identification — The structure, physiology, taxonomy and uses of plants, with emphasis on those having important biological and economic significance in the biotic zones of B.C. Introduction to reproduction of plants with particular emphasis on conifers. Recognition and evaluation of common plants in forest, range land and alpine habitats of British Columbia and their uses in land management practices. A plant collection containing at least 75 native plant species is required from students.

FSTR 104 Photo Interpretation and Mapping 1 — Practical use and application of aerial photography in natural resources. Classification, reconnaissance, planning and inventory using aerial photos. Practice in the use of stereoscopes. Construction of forest maps and plans. Transfer of detail from aerial photos using Map-O-Graph, Kail plotters and pantographs. Drafting and map reproduction techniques. Continues in FSTR 204.

FSTR 105 Fire Management 1 — Historical review of fire behavior simulated to show the effects of topography, fuel and weather conditions. Pre-suppression, including fire-danger ratings, detection, reporting and general preorganization of industrial and government agencies. "Forest Act", Part XI. Fire suppression techniques through fire simulation and prescribed burning training in initial action and problem-solving.

FSTR 108 Introduction to B.C. Natural Resources — Provides basic background material on B.C.'s land and climate regions, major natural resources, the agencies and industries involved with such resources, and their relative value to the province. The evolution of each resource industry and the current relevant legislation is discussed. The fields of fisheries, forestry, range, wildlife, agriculture, parks and recreation, tourism, mining, gas and oil, and hydro power are explored. Resource integration processes are discussed and relevant tenure systems are described. The need for cooperation and understanding among resource users is demonstrated.

FSTR 201 Forest Measurement 1 — Continuation of FSTR 101. Methods of measuring standing and felled timber. Direct measurement of tree diameters, heights and ages. Field mapping. Characteristics and uses of standard volume tables. Construction of local volume tables. Types of sampling and design and elementary statistical analysis. Compilation methods for sample data. Computer use for data summary. Report writing. Prerequisite: FSTR 101, FSTR 104, MATH 145.

FSTR 202 Introduction to Soils — Introduces students to soil formation, soil as foundation and soil as a medium for plant growth. Covers the properties of soils, texture, structure and organic matter content, and water retention. Introduces students to the soils and landscapes of British Columbia. Prerequisite: Level 1 of the program.

FSTR 203 Ecology — Introduction to basic concepts and terminology of ecology. Discusses ecosystem components, energy flow and management of ecosystems. Students will identify numerous terrestrial and aquatic ecosystems. Emphasis is placed on the Biogeoclimatic Zone System of B.C., and on field identification of ecosystem associations, their productivity and management constraints. Forest succession, the role of fire, fish and wild life habitats, and recreational planning are discussed. Examples are drawn from current environmental issues. Prerequisite: FSTR 101, FSTR 103, FSTR 108.

FSTR 204 Photo Interpretation and Mapping 2 — see FSTR 104. Prerequisite: FSTR 104, MATH 145 or 154.

FSTR 206 Microcomputer Applications — Introduction to computers and their applications to various forestry, fish, wildlife and recreation requirements.

FSTR 207 Introduction to Fish, Wildlife and Recreation — Basic identification of various fish and wildlife and their importance and interaction with other natural resources.

FSTR 208 Integrated Resource Project — This course is an intensive one-week project, in which students from the Forestry and Fish, Wildlife, Recreation Options work together in teams to produce integrated resource use plans for a specific watershed. L.R.U.P. (Local Resource Use Plans) data and appropriate environmental, fish, wildlife, recreational, logging, silvicultural and financial information is presented by staff to implement first year course material. Each term prepares a plan, presents it with visual aids, and engages in a public involvement process. An industry/agency group provides the final review.

FSTR 301 Forest Measurement 2 — Continuation of FSTR 201. Field reconnaissance; forest timber volume measurement and calculation; sampling design; field mapping; data compilation; report writing. Subjects include current cruising procedures, acceptable sampling design, elementary statistical analysis, computer application for data summaries. Prerequisite: FSTR 201 or 251; FSTR 204; MATH 245.

FSTR 302 Timber Harvesting 1 — This course deals with common harvesting systems used on the B.C. coast, and includes associated phase costs, setting and landing layouts, deflection lines, environmental and safety aspects, and some discussion of integrated resource planning. The field project takes several labs to complete and concludes with a mini-contract to harvest and re-forest the given area. Other topics in the course relate to harvesting on the coast as well as the interior. Prerequisite: 1st year Forestry or instructor's approval.

FSTR 303 Roads and Transportation 1 — Truck road location. Preparation of plans and profiles. Measurement of earth and rock work. Optimum road standards, culvert design, construction and maintenance. Prerequisite: 1st Year Forestry or instructor's approval.

FSTR 304 Forest Pestology — An integrated study of forest insect and disease problems. Basic life histories. The interactions of damage agencies in the forest. Improved cruise techniques related to insect and disease damage. Use of subject literature. Cooperation with authoritative government agencies. Prevention and control of damage. Measuring and reporting of insect and disease damage. Recognition of the currently important insects and diseases. Prerequisite: Completion of 1st year of the program.

FSTR 305 Silviculture 1 — Foundations of forest management: site, stocking, spacing, forest yield, forest growth and regulation. Introduction to silviculture: forest regeneration, seed and stock procurement, principles of seed production and cone collection. Prerequisite: FSTR 103, 202 and 203.

FSTR 307 Recreational Land Management — An introductory course in recreational land management. Development and recreational use of areas designed as natural parks. Survey of outdoor recreation, history and organization of agencies providing recreational activities in parks. Park development, planning and design. Practical exercises in site analysis, planning and design for specific uses. Park and natural history interpretation. Park operation and administration. Assessment and development of recreational areas both in and out of established parks. Recognition of recreational sites by aerial photo interpretation of landforms. Private and public programs in forest recreation. Land tenures and land acquisition for recreation. Visual resource management. Summer and winter sports area developments. Water-oriented activities, trail design, mountaineering, search and rescue. The packaging of outdoor recreation opportunities including the operation of hunting and fishing camps, guided

hikes and commercial rafting companies. Attendance at a week-end seminar on Tourism and Outdoor Recreation is mandatory. Prerequisite: Completion of the 1st year of the program, or instructor's approval.

FSTR 308 Wildlife Management — The principles and practice of wildlife management, with particular reference to problems and procedures in British Columbia wildlife environments. Dynamics of wildlife populations. Methods of study. Harvesting. Regulations. Natural and artificial regulation of animal numbers. Diseases and parasites. The economics of wildlife, particularly in forest habitats. Extensive field study to support and extend lecture and lab material. Prerequisite: Completion of 1st year of the program, or instructor's approval.

FSTR 309 Fish Management 1 — The biology of British Columbia fish, including anatomy, taxonomy, physiology, behavior and ecology. Management aspects of fisheries, including population dynamics, habitat evaluation and improvement, harvesting, pollution and fishery regulations. Labs deal with methodology as it applies to the above and much of the training in this regard will be done in the field. Emphasis throughout is on the British Columbia situation. Prerequisite: Completion of 1st year of the program, or instructor's approval.

FSTR 310 Projects — Requires the writing of a major library research paper related to a specific resource management topic. The format outlined in the Council of Biological Editors (CBE) Style Manual is utilized. Prerequisite: 1st year of the program.

FSTR 311 Summer Technical Report — A detailed report on a phase of resource management from first-hand experience or from approved library research.

FSTR 312 Environmental Law Enforcement — Deals with the many aspects involved in the interpretation and enforcement of legislative acts relating to the management of Canada's wildland resource. Among these are the "Fisheries Act", "Parks Act" and the "Wildlife Act".

FSTR 326 Forest Management — Forest tenures and policy in the Province of British Columbia, growth, yield and regulation of coastal Douglas Fir stands, calculation of coastal and interior stumpage appraisal, introduction to timber supply area management, development of a forest management and working plan for a tree farm licence, development of an integrated resource management plan.

FSTR 401 Log Scaling — A metric log scaling course, with instruction occurring primarily on log booms in the Fraser River and theory reinforced through classroom sessions. The course includes species recognition, volume calculation, deduction for defect and grading of logs. Visits to conversion facilities to observe lumber recovery, shake and shingle production and veneer manufacturing from logs will be included.

FSTR 402 Timber Harvesting 2 — Deals with harvesting systems in use in the interior of B.C., and includes various logging phases and associated costs, log production planning and scheduling, cost equalization points, and the matter of interest. In addition, contracts and contract logging, forest landscape planning and industry and government relationships in managing our resources will be discussed. There will be field work associated with the course, and an important logging research report and oral presentation. Prerequisite: FSTR 302.

FSTR 403 Roads and Transportation 2 — Simple log span bridge design, construction and maintenance. Explosives. Truck road construction, maintenance and costing. Hauling costs. Log dumps, sorting logs on water or land. Booming grounds. Water transportation of logs. Prerequisite: FSTR 303.

FSTR 404 Forest Pestology — see FSTR 304. Prerequisite: FSTR 304.

FSTR 405 Silviculture 2 — Site examination, analysis and prescriptions; site preparation, planning methods, evaluating artificial regeneration, methods application, contract, planting, costing and inspection; brush control methods and application; spacing methods and evaluation; conifer release, application; fertilization, methods and application. Prerequisite: FSTR 305.

FSTR 407 Recreational Land Management — see FSTR 307. Prerequisite: FSTR 307.

FSTR 408 Wildlife Management — see FSTR 308. Prerequisite: FSTR 308.

FSTR 409 Fish Management 2 — see FSTR 309. Prerequisite: FSTR 309.

FSTR 410 Projects — Requires the writing of a "field oriented" research paper related to the topic of the library research paper required in FSTR 310. Prerequisite: FSTR 310.

FSTR 413 Independent Studies — Offers an opportunity to student groups or individuals to become involved in a subject area or work which is of special interest to them. Each student will select a subject area and devote two full weeks to fulfil the requirements of the course, under the direction of a staff member. The student must submit a memo, project outline, daily journal, and report of acceptable standard to the Independent Studies Committee before the designated deadlines. The course occurs during the last two weeks of term 4, after final exams have been written.

FSTR 415 Fire Management 2 see FSTR 105. Prerequisite: FSTR 105.

FSTR 416 Natural Resource Administration — Many of the functions once performed by government agencies and industry in the natural resource field are now being contracted out. This course is designed for people interested in embarking on a career in service contracting to the natural resource industry. Upon successful completion of this course, the student will have a basic knowledge of small business planning, be able to read and understand financial statements, understand simple double-entry accounting principles, be able to project a business plan for entrepreneurial activities and develop estimates for contract work.

FSTR 426 Forest Administration — See FSTR 416.

MATH 145 Basic Technical Mathematics for Forest Resources — Systems of measurement, mensuration, and trapezoidal and Simpson's rules. Angular systems, radian measure applications, trigonometric ratios and Sine/Cosine laws. Ratio, proportion and variation. Polynomials, formulae, functions and their graphs. Graphical linear programming. Vectors and applications. Introduction to descriptive statistics with histograms and ogives.

MATH 154 Basic Technical Mathematics for Fish, Wildlife and Recreation — Systems of measurement, mensuration, trapezoidal and Simpson's rules. Angular systems, radian measure applications, trigonometric ratios and Sine/Cosine laws. Ratio, proportion and variation. Polynomials, formulae, functions and their graphs. Graphical linear programming. Vectors and applications. Introduction to descriptive statistics with histograms and ogives.

MATH 245 Mathematics 2 for Forest Resources — Further descriptive statistics. Probability theory and laws. Random variables, discrete and continuous theoretical distributions. Estimation, hypothesis testing, count data analysis and stratified

sampling analysis. Regression and correlation including related estimation.

MATH 254 Statistics Fish, Wildlife and Recreation — Organization and presentation of data, frequency distributions and measures of central tendency; variation, skewness and kurtosis. Probability theory and laws. Random variables, discrete and continuous theoretical distributions. Sampling, estimation and hypothesis testing with both large and small samples. Analysis of variance. Method of least squares, regression and correlation, and curve fitting. Some non-parametric statistics.

TCOM 106 Technical Communication — In this course students practice writing skills applicable to the forest resource industry. Instruction, claim, request and adjustment letters and process and mechanism descriptions are covered. They also practice technical library search techniques and oral briefings.

TCOM 206 Technical Communication — Students write incident, progress, comparison and formal, technical reports. They also write a proposal, resume and job application letter. They practice formal meeting, interview and research techniques and are exposed to word processing. Prerequisite: TCOM 106.

TCOM 209 Technical Communication — Introduces students to technical and scientific communication skills required for a career in FWR. They study the principles of effective technical communication, business and technical formats, correspondence, short reports and research techniques for fish, wildlife and parks management topics.

TCOM 304 Advanced Technical Communication — In this course, students review writing skills and apply them to the Summer Technical Report, a major report marked both by the instructor and employers who are Institute graduates. Students also practice revision and editing skills, write several memos and give a major oral technical report. Prerequisite: TCOM 106, TCOM 206.

TCOM 308 Advanced Technical Communication — Students refine job finding skills and update their resumes and application letters. They practice specialized formats and write lengthy technical and scientific reports typical of fisheries, wildlife and parks management. Prerequisite: TCOM 209.

TCOM 402 Advanced Technical Communication — Students update their resumes and job application letters. They also write a procedure, progress report, trip report, journal and several types of advanced business letters typical of the forest industry. They practice illustrating, analytical and organizational skills and write a major report about logging equipment done in conjunction with the logging course. They receive up-to-date information about word processing.

TCOM 406 Public Information Techniques for Fish Wildlife and Recreation — In this course, students study specialized principles and techniques for communication with the public through interpretive and educational programs and the media. They write promotional data, news releases and journal articles. They practice public speaking, preparing graphic displays, interview techniques and interpretive program design. Prerequisite: TCOM 209, TCOM 308, TCOM 405.

Natural Resource Management

Post-diploma Program

Forest Resource Technology

This post diploma program is designed to meet the needs of resource technologists who wish to broaden their knowledge of the major natural resources of British Columbia.

The Program

This nine-month program (two terms) examines the natural resources of British Columbia and the needs, constraints and methods to manage these resources in the best interests of the province. Included will be fish, wildlife, recreation, rangeland, hydrology (water), agriculture, mining, tourism and their interdependencies (natures).

When course credits are given, electives will be chosen in consultation with Department Head.

Prerequisites

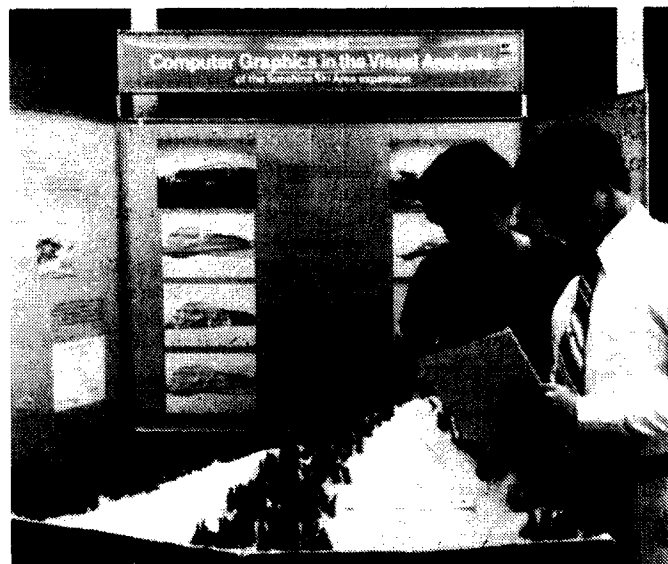
Graduation from a BCIT diploma program or a two-year college program in an engineering or business technology. Baccalaureate degree in bio science, engineering, geography or geology will also be considered.

Faculty and Staff

W.R. Cannon, B.A., Acting Department Head
 N.E. Alexander, M.P.M.
 M.R. Angelo, B.S.F., M.F.
 F. Cassetta, B.Sc.F., R.P.F.
 C.W. Chestnut, B.A., Ph.D., (on leave)
 E.C. Crossin, B.S.F., R.P.F.
 D. Guthrie, B.Sc., M.Sc., Ph.D.
 A.G. Jakoy, B.S.F., M.Sc., R.P.F.
 G. Rosberg, B.Sc., Dipl.T.
 J. Simpson, B.Sc.F., M.Sc.
 B. Sivak, B.S.F., M.F., Ph.D., R.P.F., on leave

PROGRAM: Natural Resources

	Clrm hrs/wk
Level 1	
FSTR 501 Fish Resource	2.0
FSTR 502 Rangeland Management	4.0
FSTR 503 Hydrology and Geomorphology	1.0
FSTR 504 Forest Land Management	6.0
FSTR 505 Interdependent Resources	4.0
FSTR 506 Projects Special Topics and Current Issues	6.0
FSTR 507 Wildlife Resource	2.0
FSTR 508 Recreation Resource	2.0
Level 2	
FSTR 601 Natural Resource Planning	6.0
FSTR 602 Environmental Impact Assessment	6.0
FSTR 603 Environmental Law	3.0
FSTR 604 Natural Resource Economics	5.0
FSTR 606 Projects	5.0
FSTR 613 Independent Studies	3.0
TCOM 607 Public Information Techniques	2.0
Electives	3.0



Course Descriptions

FSTR 501 Fish Resource — The identification, habitat and life cycles of British Columbia's fish and wildlife. The principles and practice of recreational land management, and the importance of interaction with all other resources.

FSTR 502 Rangeland Management — Includes identification of common range plants, know ledge of range distribution, types of range, productivity intensity and variety of uses, assessment of productivity and stocking, range reclamation, season of use, impact on the forest resource and non-grazing use of range land.

FSTR 503 Hydrology and Geomorphology — Assumes a basic knowledge of the factors that have shaped the earth and of the hydrologic cycle. The course includes a review of the broad landforms of B.C., their evolution and a consideration of the sensitivity of representative landforms to various types of development. Some aspects of the hydrology of forested ecosystems are discussed and specific effects of natural resource use on hydrological systems are presented.

FSTR 504 Forest Land Management — Is designed for non-forestry students and includes background in most second year forestry courses including forest tenure and policy in the Province of British Columbia, concepts in integrated resource use policy and management, timber supply area management and planning, operational planning with integrated resource considerations, and basic background information relating to pestology and silviculture.

FSTR 505 Interdependent Resources — A conceptual overview of other non-forested resources such as agriculture, mining, water, tourism, etc. Includes an introduction to the use of microcomputers in the processing of natural resource management data, and an exposure to pesticide use and abuse.

FSTR 506 Projects, Special Topics and Current Issues — Will include discussions and use of guest lectures relating to current resource topics/issues. A project will also be selected by a student from any of these topics or one of his own choosing in the resource field.

FSTR 507 Wildlife Resource — The identification, habitat and life cycles of British Columbia's wildlife and the roles they play in the environment.

FSTR 508 Recreation Resource — The principles and practice of recreational land management. Tourism as related to outdoor recreation.

FSTR 601 Natural Resource Planning — The emphasis is on *integrated resource use*. Guest lecturers with expertise in resource planning may be included as part of the instructional team. The course will emphasize integrated resource planning analysis by examining the planning systems used by various resource agencies. Examples of procedures from various levels of planning will be considered.

FSTR 602 Environmental Impact Assessment — Assessment of environmental impact and inventory techniques.

FSTR 603 Environmental Law — The court system in B.C.; review of various provincial and federal resource Acts; two case studies; court visit and observation of ongoing cases.

FSTR 604 Natural Resource Economics — Includes economic concepts as applied to various natural resources, and relationships to consider in cost/benefit analysis.

FSTR 606 Projects see FSTR 506. Prerequisite: FSTR 506.

FSTR 613 Independent Studies — This course offers an opportunity to student groups or individuals to become involved in a subject area or work which is of special interest to them. Each student will select a subject area and devote two full weeks to fulfil the requirements of the course, under the direction of a staff member. The student must submit a memo, project outline, daily journal, and report of acceptable standard to the Independent Studies Committee before the designated deadlines. The course occurs during the last two weeks of Term 4, after final exams have been written.

TCOM 607 Public Information Techniques — In this course, students learn specialized techniques for communicating with the public through interpretive and educational programs and the media. They write promotional data, news releases and journal articles. They practice public speaking, preparing graphic displays, interview techniques and media programs.

Mining Technology

Technologists have an important role to play in the exploration, development, and extraction of mineral resources. Up-to-date technology such as computer applications are vital to B.C. and Canadian mining due to narrow profit margins. Gross profits and total numbers employed indicate the mining industry is still commanding a major position in B.C. Coal, industrial mineral and precious metal sectors have expanded to major roles. The technology is many-faceted, and the opportunities are similarly wide-ranging.

Job Opportunities

Graduates enter a wide field of mining and related occupations, from exploration to production, from field to office: geology, geophysics, geochemistry, surveying, sampling, assaying, mine planning, production supervision, services (eg. water control, road construction), rock mechanics, diamond drilling, blasting, equipment sales and computer applications. After an initial training period, one can expect varied, creative, and often independent work with considerable responsibility. Advancement to supervisory positions is possible to graduates with initiative, ability and leadership.

Mining communities tend to have well-supported entertainment, sport, and outdoor recreation facilities. These and other benefits often permit the young family to start budgets on a more positive note.

The Program

Courses reflect the wide range of applications and include the following: geology and mining topics in all terms, mineral processing and assaying, civil engineering, surveying, physics, math and communications courses particularly adapted to mining problems. Projects and assignments emphasize industry applications and a hands-on approach and are increasingly computer-oriented. Field schools and guest lecturers are important aspects of the curriculum.

BCIT Mining students enjoy an unusually high level of student financial assistance.

There are good transfer arrangements with several universities and approximately 25% of our students ultimately continue to engineering degrees. Placements of graduates are in the 90% range.

The program is accredited by the Applied Technologists and Technicians of British Columbia.

Prerequisites

Algebra 12, Physics 11 and Chemistry 11 are course requirements for this program.

Faculty and Staff

J.T. Neilson, B.A.S., PEng., Acting Department Head
D.J. Hardie, H.N.C.
J.F. Fairley, B.A.Sc., PEng.



TECHNOLOGY: Mining PROGRAM: Mining

		Clim hrs/wk
Level 1		
CHEM 101	Applied Chemical Principles 1	6.0
MATH 150	Basic Technical Mathematics for Mining ...	5.0
MECH 101	Drafting Fundamentals	2.0
MINE 101	Geology 1	3.0
MINE 102	Mining	2.0
PHYS 101	Physics	6.0
SURV 140	Surveying	3.0
SURV 142	Hand Held Computer Techniques	1.0
TCOM 110	Technical Communication for Mining	3.0
Level 2		
CHEM 201	Applied Chemical Principles 2	6.0
MATH 250	Calculus 1 and 2 for Mining	5.0
MECH 201	Drafting	2.0
MINE 201	Geology 1	4.0
MINE 202	Mining	2.0
PHYS 201	Physics for Mining	3.0
PHYS 204	Introductory Geophysics	3.0
SURV 240	Surveying	3.0
TCOM 211	Technical Communication for Mining	3.0
Level 3		
CHSC 305	Assaying	4.0
CHSC 314	Mineral Processing	3.5
CIVL 339	Statics and Strength of Materials	3.0
MATH 350	FORTTRAN and Network Scheduling for Mining	5.0
MINE 301	Structural Geology	3.5
MINE 302	Mining	4.0
PHYS 304	Mining Geophysics	1.5
SURV 340	Surveying	3.0
TCOM 306	Advanced Technical Communication for Mining	2.0
Level 4		
CHSC 405	Assaying	4.0
CHSC 414	Mineral Processing	3.5
CIVL 440	Statics and Strength of Materials	3.0
CIVL 441	Hydraulics	3.0
MATH 450	Statistics for Mining	5.0
MINE 401	Geology — Mineral Deposits	3.5

		Clim hrs/wk
MINE 402	Mining.....	4.0
SURV 440	Surveying	3.0
TCOM 404	Advanced Technical Communication for Mining.....	2.0

Course Descriptions

CHEM 101 Applied Chemical Principles 1 — Provides the necessary background for chemical calculations and analysis. Included are stoichiometry, atomic structure, bonding, solution preparation and acid-base and oxidation-reduction reactions and titrations. Simple chemical equilibrium leads to a good working knowledge of pH, buffer solutions, solubility product, selective precipitation and industrial processes involving equilibria. Lab work consists of simple qualitative and quantitative analysis and good lab technique is taught.

CHEM 201 Applied Chemical Principles 2 — A continuation of CHEM 101 giving detailed coverage of gravimetric and volumetric analysis and qualitative analysis of cations and anions. Electrochemistry includes cells, electroplating and corrosion. Simple physical chemistry provides theory of solids, liquids and gases leading to fractional distillation and colligative properties. The Periodic Table is used to correlate many properties of elements and compounds. Names and properties of some organic compounds are covered and lab work covers qualitative and quantitative analysis and physio-chemical separations.

CHSC 305 Assaying — Analytical chemistry applied to the ore minerals, with special attention to fire assaying for gold and silver. Gravimetric, volumetric and instrumental methods are developed for the more common metals.

CHSC 314 Mineral Processing — Deals specifically with mineral processing as applied to the B.C. mining industry. Covers the essential operations of applied mineral processing ie: grinding, screening, gravity separation, cyclone classification, flotation, sedimentation, thickening, filtration. Emphasis on numerical solution of operating and design type problems. Course includes laboratory work.

CHSC 405 Assaying — A continuation of CHSC 305.

CHSC 414 Mineral Processing — A continuation of CHSC 314. Prerequisite: CHSC 314.

CIVL 339 Statics and Strength of Materials — The definitions, representations and uses of forces and moments are presented, leading to the equations of equilibrium. Following topics include: free bodies, trusses, stresses and shear and bending moment diagrams.

CIVL 440 Statics and Strength of Materials — Simple stresses; stress, strain elasticity; compound bars and columns; temperature stress; elastic limit; limit of proportionality; yield; ultimate; factor of safety; load factor; ductility; resilience; fatigue; shock. Properties of sections; bending moments; shear forces; theory of flexure; deflection of beams; eccentric loading; lateral loading; compound stress and strain; Poisson's ratio; principal stress and strains; Mohr's circle; testing techniques; machines; extensometers; strain gauges; photo elasticity. Special sessions on rock mechanics. Prerequisite: CIVL 339.

CIVL 441 Hydraulics — Properties of fluids, hydrostatics, pressure and centre of pressures; fluid flow, continuity equation, velocity head, Venturi meters. Pipe friction and flow. Flow conditions. Open channel flow in flumes and streams. Flow measurement. Lab demonstrations. Pumps. Prerequisite: CIVL 339.

MATH 150 Basic Technical Mathematics for Mining — Graphical linear programming. Exponential/logarithmic theory and transformations, common and natural logarithms and logarithmic/semilogarithmic graphs. Radian measure. Trigonometric functions of any angle, vectors and solution of triangles, graphs of trigonometric functions, identities, compound and double angle formulas, trigonometric equations and inverse functions.

MATH 250 Calculus 1 and 2 for Mining — Limits, the derivative, differentiation rules for algebraic, trigonometric, inverse trigonometric, logarithmic and exponential functions; curve sketching, implicit differentiation, higher order derivatives, applied maxima/minima, related rates and differentials. Antidifferentiation, the indefinite integral and the definite integral including area, volume, centroid and other applications. Tables of integrals, integration by parts, partial fractions and substitution techniques.

MATH 350 FORTRAN and Network Scheduling for Mining — FORTRAN arithmetic and variables; input/output and formatting, branching, arrays, functions and subroutines. Critical path networking principles, events, activities and slack. Network replanning and adjustment, and crashing a project. Scheduling under limited resources and resource leveling.

MATH 450 Statistics for Mining — Linear programming using the simplex method. Organization and graphical presentation of data, frequency distributions and measures of central tendency, variation and other measures. Probability theory and laws. Random variables, discrete and continuous theoretical distributions. Sampling, estimation and hypothesis testing with both large and small samples. Method of least squares, regression and correlation. Geostatistical estimation.

MECH 101 Drafting Fundamentals — An introductory course for persons with little or no experience in graphics. (Students are required to purchase drafting equipment and supplies on the first night of class) Students learn to produce and read simple drawings. Topics include scales, geometric constructions, basic orthographics detail interpretation, line visibility, dimensioning, auxiliary views, true shape, inclined and skew surfaces, sections, pictorials, working drawings and freehand sketches.

MECH 201 Drafting (Mining) — Involves techniques in ink, contours, intersection and developments, dip, strike and outcrop, sections, profiles, descriptive geometry and other graphical mining problems.

MINE 101 Geology 1 — Definition, basic concepts, earth's crust, geologic time; atomic structure of minerals, crystal forms and symmetry systems; properties of common minerals, sedimentary rock types, clastic and chemical sedimentaries; igneous rock types, classification; deformation of earth's crust, folds, faults; metamorphic rocks; weathering, erosion and glaciation; economic geology, mineral fuels, non-metallics, ore deposits and their controls; geological history, pre-Cambrian, Paleozoic, Mesozoic, Tertiary, Pleistocene; geologic maps.

MINE 102 Mining — The objective: an introduction to the general sphere of mining and, more particularly, mining exploration. 10 hrs. on identifying the factors important to mine profitability; 20 hrs. giving a unified picture of modern prospecting techniques: geochemistry in some detail, geology, geophysics, sampling and diamond drilling. Maps, photos, reports and references; economics and planning.

MINE 201 Geology — Definition, basic concepts, earth's crust, geologic time; atomic structure of minerals, crystal forms and symmetry systems; properties of common minerals, sedimentary rock types, clastic and chemical sedimentaries; igneous rock types, classification; deformation of earth's crust, folds, faults; metamorphic rocks; weathering, erosion and glaciation; economic geology, mineral fuels, non-metallics, ore deposits and their controls; geological history, pre-Cambrian, Paleozoic, Mesozoic, Tertiary, Pleistocene; geologic maps.

tary rock types, clastic and chemical sedimentaries; igneous rock types, classification; deformation of earth's crust, folds, faults; metamorphic rocks; weathering, erosion and glaciation; economic geology, mineral fuels, non-metallics, ore deposits and their controls; geological history, pre-Cambrian, Paleozoic, Mesozoic, Tertiary, Pleistocene; geologic maps. A continuation of MINE 101.

MINE 202 Mining — A full description of mining methods; brief subjective descriptions of rock mechanics, fragmentation and mine services which receive detailed treatment elsewhere. Unit operations of drilling, blasting, loading and hauling are discussed in the context of organization, equipment, labor and supplies. Prerequisite: MINE 102.

MINE 301 Structural Geology — Brief review of mechanical principles of rock deformation and of the primary structures of sedimentary, igneous and metamorphic rocks. The origin, nature and classification of joints, folds and faults, with emphasis on their relation to mineral resources. Lab work includes examinations of specimens, methods of recording structural data, mapping and solution of structural problems, with emphasis on economic aspects. Prerequisite: MINE 203.

MINE 302 Mining — Two objectives: rock mechanics and mine services. Rock mass classification and field observations, data storage and retrieval (stereonet), stress field description and modes of failure, ground water effects, ground control methods (pit slope stability design, pillars, subsidence and underground support systems) and ground movement monitoring. Electrical power, compressed air, water control ventilation, underground development, materials handling systems not otherwise covered, reclamation and pollution control, safety, management. Guest lecturers used extensively. Prerequisite: MINE 204.

MINE 401 Geology — Mineral Deposits — The terminology, classification, manner of occurrence, distribution and economics of mineral resources, with emphasis on typical Canadian occurrences. Ways of recognizing, discovering and developing mineral deposits. Lab work illustrates and develops techniques in megascopic study and identification of hand specimens; valuation of mineral deposits, computer data storage and retrieval. Field trips are correlated with all classroom work in geology. Prerequisite: MINE 203.

MINE 402 Mining — Two objectives: mine planning and fragmentation. Economics: cost estimating both capital and operating, accounting and records, taxation, marketing (smelter and coal contracts and specifications), balance sheets, financial statements, cash flows and present values, equipment selection. Sampling, cutoffs, waste/ore ratios, geostatistics and mine modelling, largely computerized. Fragmentation subjects include drilling systems, explosive properties and products, safety, field application design. Field labs include high speed photography of students' full scale tests. Prerequisite: MINE 206.

PHYS 101 Physics for Mining, Natural Gas and Petroleum — A general level course covering mechanics, dynamics and the properties of solids and fluids. The associated laboratory covers the principles of measurement and the experimental method of acquiring knowledge.

PHYS 201 Physics for Mining, Natural Gas and Petroleum — A general level course covering thermal properties of matter, waves, electricity, magnetism, electromagnetism and atomic and nuclear physics.

PHYS 204 Introductory Geophysics — Utilizing concepts covered in PHYS 201, the course is an introduction to the uses of geophysics in the search for ore deposits. The course consists of lectures, case study exercises and some field exercises cov-

ering the gravity, magnetic, resistivity, self-potential and seismic method of analyzing the physical properties of the earth.

PHYS 304 Mining Geophysics — Consists of field work and some lectures on geophysical methods of mineral exploration. Emphasis is on the operation of geophysical instruments, the method of conducting geophysical surveys and the presentation and interpretation of data.

SURV 140 Surveying — Substance of course on ground points, sighting devices; measurement of distances and angles with a variety of instruments, tapes, etc., under a variety of conditions; compass; accuracy and precision; planetable; errors and mistakes; direction; stadia, profiling; topography; line production offsets; interlining and intersection; random lines and physical feature ties; computations — traverses, coordinate systems; triangulation; areas and volumes; special engineering survey problems and curves.

SURV 142 Hand Held Computer Techniques — An introductory course in the use of the microcomputer to solve various mathematical and surveying problems. Emphasis will be on the application of the small computer system to the solution of mining related problems. Topics include computer programming in BASIC and in small computer systems communications.

SURV 240 Surveying — see SURV 140.

SURV 340 Surveying — Application of survey methods to underground and surface mines. Underground surveying in shaft sinking, development control (level and inclined) and production areas. Elementary astronomy, establishing azimuth by solar and pole star observations. Mine quantities in development areas, pickup of tunnels, cross sectioning, stopes (including tonnage calculations). Construction of mine plans and sections. Field projects include tunnel surveys and open-pit triangulation, tri- lateration and bench pickup. Mining Acts applied to surveying.

SURV 440 Surveying — This is a continuation of SURV 340. The content is the same.

TCOM 110 Technical Communication for Mining — Students receive practice in entry-level writing skills for the mining industry. They write letters of inquiry, request, complaint and adjustment, and short technical memos. They also give an oral technical report.

TCOM 211 Technical Communication for Mining — The major portion of the course provides instruction and practice in writing many different kinds of short, informal, industry-related reports. Students learn how to write resumes and job application letters. They also participate in job interviews, meetings and oral technical briefings. Prerequisite: TCOM 110.

TCOM 306 Advanced Technical Communication for Mining — This course builds on the practice and principles presented in first year. It introduces students to more difficult kinds of letters, memos and short reports. It includes instruction and practice in handling criticism and grievance procedures, participating in meetings, retrieving technical mining-related data, and briefing small groups. As far as possible, assignments are integrated with students' other courses. Prerequisite: TCOM 110, TCOM 211.

TCOM 404 Advanced Technical Communication for Mining — Students complete and update the job search component begun in first year. They then work on more specialized technical reports — site descriptions, geological reports and analytical reports on specific mining methods and equipment. They give a final technical briefing on their mining methods report. As far as possible, assignments are integrated with students' other courses. Prerequisite: TCOM 110, TCOM 211, TCOM 306.

Petroleum Technology

Because of its size and diversity, the petroleum industry is unique, both in its extremely wide range of occupational opportunities, and in the many challenges it offers employees for learning and growing.

Job Opportunities

The petroleum industry can be considered under four general areas: Exploration and Production, Transmission and Distribution, Manufacturing (refining), and Marketing. There are a variety of positions to be filled by Natural Gas and Petroleum Technology graduates in each of these areas. Past graduates are successfully employed in all these areas, both in Canada and throughout the world. Positions available include:

Exploration and Production: geologic studies, reservoir studies, well testing and servicing.

Transmission and Distribution: operation and maintenance of pipelines, utility studies and corrosion control.

Manufacturing: process operations, laboratory and product quality control, effluent control.

Marketing: product application for all of the petroleum products produced for commercial and industrial equipment.

The Program

The curriculum is designed to cover all major aspects of the petroleum industry, thereby enabling the graduate to successfully enter any area of the industry. The first year covers petroleum geology, reservoir studies and the production and field handling of oil and gas. Emphasis is also given to the basic sciences — chemistry, physics and mathematics — necessary for the scientific and engineering principles involved in studies throughout the course.

The second year covers pipeline transmission, oil refining and products utilization and gas distribution. Alternate fuels are also examined. Computer applications in all areas of studies will be emphasised. Classroom and laboratory instruction will be supplemented by field trips to local installations.

This program is accredited by the Applied Science Technologists and Technicians of B.C.

Prerequisites

Algebra 12, and Physics 11 or Chemistry 11 are course requirements for this program. Students should have a keen interest in the operation of large-scale equipment, be prepared to work outdoors and, with training, must be capable of assuming responsibility for the satisfactory and safe operation of highly complex plant equipment.

Faculty and Staff

J.T. Neilson, B.A.Sc., P.Eng., Acting Department Head
D.A. Campbell, B.A., (Hons.), M.Ed.
R.G. Kinney, Dipl.T., A.Sc.T.T.



TECHNOLOGY: Petroleum

		Cirm hrs/wk
Level 1		
CHEM 101	Applied Chemical Principles 1	6.0
CHSC 106	Engineering Materials	3.5
MATH 147	Basic Technical Mathematics	5.0
NGAS 102	Petroleum Geology	4.0
NGAS 103	Properties of Reservoir Fluids	3.0
PHYS 101	Physics	6.0
TCOM 108	Technical Communication	3.0
Level 2		
CHEM 201	Applied Chemical Principles 2	6.0
COMP 122	Computer Applications	2.0
MATH 247	Calculus 1 and 2	5.0
NGAS 201	Field Production of Gas and Oil	3.0
NGAS 202	Field Handling of Gas and Oil and Gas Processing	2.0
PHYS 201	Physics	3.0
PHYS 204	Introductory Geophysics	3.0
SURV 128	Introduction to Surveying	3.0
TCOM 208	Technical Communication	3.0
Level 3		
CHEM 310	Physical Chemistry	5.0
CHSC 341	Unit Operations	6.0
CHSC 351	Pollution Control	3.0
MATH 347	Differential Equations	5.0
NGAS 306	Oil Refining	4.0
NGAS 307	Pipeline Transmission	6.0
NGAS 308	Fuels	2.0

		Cirm hrs/wk
Level 4		
CHEM 415	Petroleum Chemistry.....	5.0
CHSC 441	Unit Operations.....	6.0
MATH 447	Statistics and Numerical Methods.....	5.0
NGAS 401	Gas Distribution and Utilization	4.0
NGAS 402	Petroleum Products: Testing and Utilization.....	5.0
NGAS 403	Process Dynamics.....	3.0
NGAS 404	Computer Simulation and Control	2.0

Course Descriptions

CHEM 101 Applied Chemical Principles 1 — Provides the necessary background for chemical calculations and analysis. Included are stoichiometry, atomic structure, bonding, solution preparation and acid-base and oxidation-reduction reactions and titrations. Simple chemical equilibrium leads to a good working knowledge of pH, buffer solutions, solubility product, selective precipitation and industrial processes involving equilibria. Lab work consists of simple qualitative and quantitative analysis and good lab technique is taught.

CHEM 201 Applied Chemical Principles 2 — A continuation of CHEM 101 giving detailed coverage of gravimetric and volumetric analysis and qualitative analysis of cations and anions. Electrochemistry includes cells, electroplating and corrosion. Simple physical chemistry provides theory of solids, liquids and gases leading to fractional distillation and colligative properties. The Periodic Table is used to correlate many properties of elements and compounds. Names and properties of some organic compounds are covered and lab work covers qualitative and quantitative analysis and physio-chemical separations.

CHEM 310 Physical Chemistry — Presents the kinetic theory of gases, the first and second laws of thermodynamics, phase equilibria, chemical kinetics and catalysis. Lab work consolidates lecture material and gives experience in practical physio-chemical measurements.

CHEM 415 Petroleum Chemistry — Presents a survey of the properties and common reactions of the classes of organic compounds which are found in petroleum or are of importance in the petrochemical industry. The chemistry of refining processes, instrumental lab analysis and synthesis of some petrochemicals are presented.

CHSC 106 Engineering Materials — A comparison of materials — concrete, metals, alloys, polymers and ceramics. Common causes of failure in service including corrosion, wear, fatigue and embrittlement. Lab sessions emphasize physical testing and non-destructive testing.

CHSC 341 Unit Operations — First and second law of thermodynamics; enthalpy, entropy, phase rule, thermodynamic diagrams and tables; properties of steam; fluid flow and measurement in pipes and channels, piping, pipe fittings and valves; flow of heat, conduction, convection, radiation, film and overall transfer co-efficients, heat exchangers; principles and application of equipment for evaporation, distillation, absorption, extraction; humidification and dehumidification; drying; solid-liquid and liquid-liquid extraction.

CHSC 351 Pollution Control — Fundamentals of waste treatment and management systems. Basic sampling and testing techniques.

CHSC 441 Unit Operations — see CHSC 341.

COMP 122 Computer Applications — Introduction to the components of a computer. Introduction to "BASIC" on a microcomputer. Relationship of data to input/output. Introduction to "FORTRAN" and "WATFIV" on the IBM mainframe computer. The problems solved via programming are in the natural gas & petroleum field.

MATH 147 Basic Technical Mathematics for Gas and Petroleum — Graphical linear programming. Exponential/logarithmic theory and transformations, common and natural logarithms and logarithmic/semilogarithmic graphs. Radian measure. Trigonometric functions of any angle, vectors and solution of triangles, graphs of trigonometric functions, identities, compound and double angle formulas, trigonometric equations and inverse functions.

MATH 247 Calculus 1 and 2 for Natural Gas and Petroleum — Limits, the derivative, differentiation rules for algebraic, trigonometric, inverse trigonometric, logarithmic and exponential functions; curve sketching, implicit differentiation, higher order derivatives, applied maxima/minima, related rates and differentials. Antidifferentiation, the indefinite integral, and the definite integral including area, volume, centroid and other applications. Tables of integrals, integration by parts, partial fractions and substitution techniques.

MATH 347 Differential Equations for Natural Gas and Petroleum — Methods of integration including integration by parts, trigonometric substitution and partial fractions. Partial differentiation with applications. Elementary differential equations and separation of variables. First order (integrating factor and numerical solution) and second order differential equations with applications.

MATH 447 Statistics and Numerical Methods for Natural Gas and Petroleum — Organization and graphical presentation of data, frequency distributions and measures of central tendency, variation and other measures. Probability theory and laws. Random variables, discrete and continuous theoretical distributions. Sampling, estimation and hypothesis testing with both large and small samples. Method of least squares, regression and correlation. Linear programming using the simplex method and the transportation problem. Solution of algebraic and transcendental equations by iterative methods.

NGAS 102 Petroleum Geology — Covers topics in petroleum geology and rotary drilling. Petroleum geology topics include: historical geology, composition of the earth's crust, origin of petroleum, petroleum migration, geology of reservoirs, structural and stratigraphic traps, sedimentary formations, carbonate formations, basic reservoir production calculations, construction of isochore and isopach subsurface maps. Rotary drilling topics include: drilling rigs, the drill string, drilling, drilling fluids, well control, down-hole equipment, an introduction to well testing and servicing.

NGAS 103 Properties of Reservoir Fluids — Introduces the student to the chemical composition and physical properties of natural gas and crude oil, and the phase behavior these fluids exhibit during production from a reservoir. Some elementary applications of reservoir flow characteristics are considered.

NGAS 201 Field Production of Gas and Oil — Covers basic down-hole hydraulics and an introduction to reservoir analysis and production. Topics include drilling fluids, hydraulics, core analysis, reservoir fluid flow, PVT analysis, reserves determination, production techniques and enhanced recovery techniques. A project related to reserves determination will be assigned during the term. Prerequisite: NGAS 102.

NGAS 202 Field Handling of Oil and Gas Processing — Covers the handling of crude oil and natural gas from the well head to the transmission pipeline. Field handling to include: fluid stabilization, gas separation, hydrate control, emulsion treating, well effluent recombination calculations. Gas processing covers: sweetening, sulfur recovery, dehydration, natural gas liquids recovery. A technical report with oral presentation is required.

NGAS 306 Oil Refining — Petroleum refining is a very complex operation due mainly to the multitude of products that are made. This course covers the refining processes involved in the production of these products. Processes considered include: atmospheric and vacuum distillation; thermal, catalytic and hydro cracking; catalytic reforming; alkylation; polymerization; hydro-treating; chemical treating; lubricating oil refining; process and effluent water treating. A term paper with oral presentation is required.

NGAS 307 Pipeline Transmission — An introduction to natural gas transmission. Topics covered include: natural gas quality, large volume natural gas measurement, pipeline flow and design calculations, pipeline construction, design and operating codes, corrosion control, pipeline control and compressor stations.

NGAS 308 Fuels — Examines alternate uses of conventional fossil fuels. Utilization, availability and production techniques of gaseous, liquid and solid fuels are discussed. Alternate fuel sources and alternate fuel applications are then examined. Topics include: natural gas, manufactured (coal) gas, LNG, LPG, gasolines, diesel fuel, fuel oils and types of coal. Alternate fuel topics include: simulated fuels, supplemental fuels and synthetic fuels. The use of compressed natural gas, propane and or gasoline/alcohol as a motor fuel will also be examined.

NGAS 401 Gas Distribution and Utilization — An introduction to the distribution and utilization of natural gas. Topics covered include: gas measurement, pressure regulation, design and construction of distribution systems, corrosion control, leak surveys, maintenance, gas contract control, peak shaving, burner design, customer relations, system design and operational codes.

NGAS 402 Petroleum Products: Testing and Utilization — Many different products are produced in an oil refinery. Each product has its own individual requirements depending on the use to which it is to be put. The lecture part of the course examines the desired properties and specifications of these products and the equipment in which the products are used. Laboratory periods cover the testing of various products obtained from a typical crude oil. Supplementing these studies are field trips to local refineries. A major term paper is required. Prerequisite: NGAS 306.

NGAS 403 Process Dynamics — Introduces a practical and effective computer based approach for studying and evaluating 'real time' process control situations. The student is required to produce interim progress reports during the course and a final, formal technical report at the end of the course. Topics include: system dynamics, response time, control strategies, system optimization, system modelling, flow charting, transducer and control valve evaluation.

NGAS 404 Computer Simulation and Control — A course in basic computer simulation and control techniques. Emphasis will be on practical input-output applications. Topics include: concept of computer control, input-output software and hardware, interfacing, analog-digital conversions and practical applications.

PHYS 101 Physics for Mining, Natural Gas and Petroleum — A general level course covering mechanics, dynamics and the

properties of solids and fluids. The associated laboratory covers the principles of measurement and the experimental method of acquiring knowledge.

PHYS 201 Physics for Mining, Natural Gas and Petroleum — A general level course covering thermal properties of matter, waves, electricity, magnetism, electromagnetism and atomic and nuclear physics.

PHYS 204 Introductory Geophysics — Utilizing concepts covered in PHYS 201, the course is an introduction to the uses of geophysics in the search for ore deposits. The course consists of lectures, case study exercises and some field exercises covering the gravity, magnetic, resistivity, self-potential and seismic method of analyzing the physical properties of the earth.

SURV 128 Introduction to Surveying Natural Gas and Petroleum — In this course, students learn the fundamentals of clear technical writing and the principles of style and organization. They write documents relevant to the natural gas and petroleum industry, including technical descriptions and letters and memos of request, adjustment and collection.

TCOM 108 Technical Communication for Natural Gas and Petroleum — In this course, students learn the fundamentals of clear technical writing and the principles of style and organization. They write documents relevant to the natural gas and petroleum industry, including technical descriptions and letters and memos of request, adjustment and collection.

TCOM 208 Technical Communication for Natural Gas and Petroleum — Students learn the fundamentals of job seeking, meetings and reporting. They write resumes, job application letters, technical briefs and proposals, and evaluation, recommendation, trip progress and occurrence reports. They practice chairing meetings and presenting oral reports.

Surveying Technology

The skills of the survey technologist are in demand in a large number of businesses and industries. Surveying and photogrammetry are essential to many phases of industrial and business development including construction, natural resource exploration and development, and mapping. Surveying techniques have become more sophisticated through the use of electronic devices and computers so that shape, size and location of objects or land masses can be determined with precision and speed.

Job Opportunities

Surveying firms, consulting engineers, the oil and gas industry, government mapping, highway, planning and engineering departments and utility companies provide some of the job possibilities for surveying graduates. Employment may be found throughout Canada and around the world. This program is accredited by the Applied Science Technologists and Technicians of B.C.

The Program

BCIT offers both two year and specialized one year programs. In conjunction with Continuing Education, the Survey department presents a training program to the Technician level. The major surveying program is the two year course of studies leading to a National Diploma in Surveying. Students in this program acquire a solid background in math, physics, cartography, photogrammetry, plane and geodetic surveying and computers. The practical skills of note keeping, drafting, field operations and calculations are also covered. Prospective students should have a genuine interest in mathematics, computers, earth sciences and should enjoy a vigorous outdoor lifestyle. Students desiring a less academic program may take advantage of the more field-oriented Junior Technician level program. Students who select this program will normally complete Term One of the General Survey program and then transfer into a specialized course of studies in applied survey techniques.

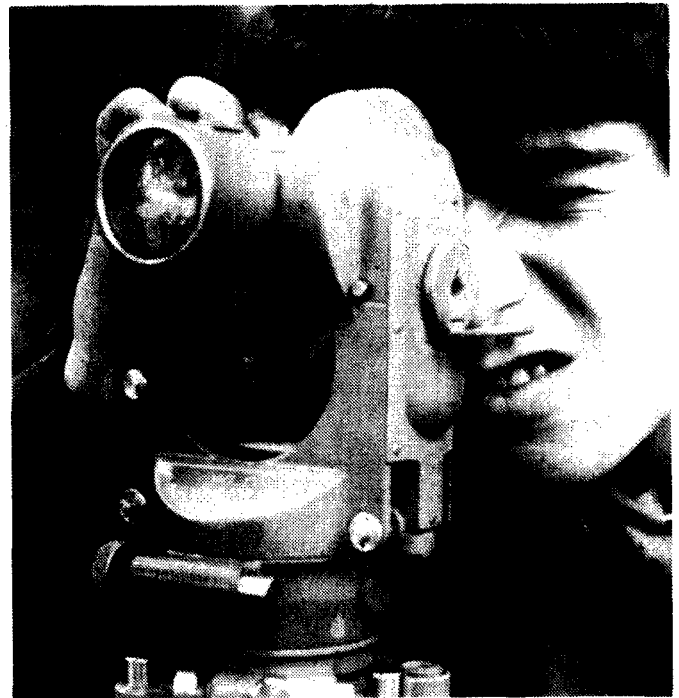
Students whose interests are centred in the areas of photography, computers and cartography, should consider the Photogrammetric Operators program. This program is a two term course of studies specializing in production photogrammetry. Employment in surveying during the summer break is considered desirable.

Post-graduation

Following completion of the two year diploma program, students are eligible for membership in the Applied Science Technologists and Technicians of BC. Graduates are granted some course credits at the University of Calgary in the Survey Engineering Department and at the University of New Brunswick and examinations set by the Western Canadian Board of Examiners for Land Surveyors' Association or Corporation of the four Western Canadian provinces.

Prerequisites

Algebra 12 and Physics 11 are course requirements for this program. Applicants should have a good understanding of math and physics to the university level. Good health is also important because of the physical demands of survey work. Photogrammetry Option students must have good stereo vision.



Faculty and Staff

R.I. McNeil, B.Surv., B.C.L.S., D.L.S., Dipl. Adult Ed., P.Eng.,
Department Head
K. Bracewell, Dipl.T.
R. Bremner, Dipl.T.
J.S. Caldwell
D.C. Deans, B.A., Program Head
K. Errington, B.C.L.S., Cert.Min.Surv., Senior Instructor
K. Frankich, Dipl.Ing., M.A.Sc., Ph.D.
K. Gysler, B.Eng., M.Eng., D.L.S., P.Eng. Chief Instructor
D. Jarvos, Dipl.T.
G. Kehoe, B.A.Sc., B.C.L.S.
D.S. Martens, Dipl.T., B.C.L.S.
R.G. Miller, Dipl.T., B.A.
W.A. Tupper, Dipl.Ing., Senior Instructor
N. Wong, Dipl.Ing., A.R.I.C.S.

TECHNOLOGY: Surveying PROGRAM: Surveying

		Clrm hrs/wk
Level 1		
MATH 151	Basic Technical Mathematics	7.0
MECH 101	Drafting Fundamentals	3.0
PHYS 123	Physics	5.0
SURV 161	Plane Survey Computations 1	3.0
SURV 164	Field Survey 1	8.0
SURV 172	Computer Applications 1	2.0
TCOM 111	Technical Communication	3.0
Level 2		
MATH 251	Calculus	7.0
MECH 203	Drafting	2.0
PHOT 267	Photogrammetry 2	3.0
PHYS 223	Physics	3.0
SURV 261	Plane Survey Computations 2	3.0
SURV 264	Field Survey 2	8.0
SURV 265	Survey Drafting	1.0
SURV 272	Computer Applications 2	2.0
TCOM 212	Technical Communication	3.0

	Clim hrs/wk
Level 3	
MATH 351 Matrix Methods	4.0
PHOT 367 Photogrammetry 3	2.0
SURV 361 Plane Survey Computations 3	2.0
SURV 362 Geodetic Surveying 1	3.0
SURV 363 Adjustments of Surveying Measurements	3.0
SURV 364 Field Survey 3	7.0
SURV 365 Drafting and Survey CAD	2.0
SURV 367 Earth Sciences	3.0
SURV 368 Descriptions and Survey Law	2.0
SURV 372 Computer Applications 3	2.0
Level 4 (14 weeks)	
MATH 451 Statistics	5.0
PHOT 467 Photogrammetry 4	5.0
SURV 461 Plane Survey Computations 4	3.0
SURV 462 Geodetic Surveying 2	4.0
SURV 463 Mathematical Cartography	4.0
SURV 465 Survey CAD 2	3.0
SURV 468 Cadastral Surveying	3.0
SURV 469 Planning and Land Utilization	3.0
SURV 464 Field Survey 4 — Field Camp (4 weeks, 6 hours daily)	0.0

PROGRAM: Technician's Program

MECH 203 Drafting	2.0
PHOT 267 Photogrammetry 2	3.0
SURV 260 Computational Methods for the Field Technician	5.0
SURV 265 Survey Drafting	1.0
SURV 268 Field Survey Techniques	13.0
SURV 272 Computer Applications 2	2.0
TCOM 121 Technical Communication	3.0

PROGRAM: Photogrammetry

Level 3	
MATH 351 Matrix Methods	4.0
PHOT 365 Cartography — Photogrammetry	2.0
PHOT 377 Photogrammetry	11.0
SURV 361 Plane Survey Computations 3	3.0
SURV 362 Geodetic Surveying 1	3.0
SURV 363 Adjustments of Survey Measurements	3.0
SURV 372 Computer Applications 3	2.0
SURV 374 Field Surveying	3.0
Level 4 (14 weeks)	
MATH 451 Statistics	5.0
PHOT 465 Cartography — Photogrammetry	4.0
PHOT 477 Photogrammetry	7.0
SURV 461 Plane Survey Computations 4	3.0
SURV 462 Geodetic Surveying 2	4.0
SURV 463 Mathematical Cartography	4.0
SURV 469 Planning and Land Utilization (4 weeks) ...	3.0
SURV 474 Field Surveying	14.0
PHOT 477 Photogrammetry	21.0



Course Descriptions

MATH 151 Basic Technical Mathematics — Quadratic equation and systems of linear equations. Trigonometric functions of any angle, solution of triangles, graphs of trigonometric functions, identities, and trigonometric equations. Celestial mechanics and angular measures. Definitions and theorems from solid geometry, solutions of spherical triangles and problems in navigation. The straight line, conic sections and transformation of coordinates.

MATH 251 Calculus — Limits, the derivative, differentiation rules for algebraic, trigonometric, inverse trigonometric, logarithmic and exponential functions; curve sketching, related rates, differentials and radius of curvature. Partial differentiation, Taylor and Maclaurin series and Puissant's theorem. Least squares theory. Antidifferentiation, the indefinite integral and the definite integral including area, volume and ARC length. Integration by parts, partial fractions and substitution techniques.

MATH 351 Matrix Methods — Matrix theory and its application in surveying focussing on the elements of matrix operations used in least squares adjustments. Included are vectors and coordinate transformations, matrix calculus, eigenvalues and eigenvectors, quadratic forms and ellipses.

MATH 451 Statistics — Organization and graphical presentation of data, frequency distributions and measures of central tendency, variation and other measures. Probability theory and laws. Random variables, discrete and continuous theoretical distributions. Sampling, estimation, propagation of error, preanalysis, regression and correlation, and the use of variance/covariance matrix.

MECH 101 Drafting Fundamentals — An introductory course for persons with little or no experience in graphics. (Students are required to purchase drafting equipment and supplies on the first night of class) Students learn to produce and read simple drawings. Topics include scales, geometric constructions, basic orthographics detail interpretation, line visibility,

dimensioning, auxiliary views, true shape, inclined and skew surfaces, sections, pictorials, working drawings and freehand sketches.

MECH 203 Drafting — Techniques in ink; intersections and developments; contours; profiles; rights-of-way; survey problems and projects.

PHOT 267 Photogrammetry 2 — Introduction to aerial photographs and other remote sensing acquired data; use of map and air photo; geometry of the air photo (scale, displacement and parallax); optics for photogrammetry (refraction, reflection, prisms and lenses); stereoscopy and stereoscopes; radial line triangulation and planimetric map compilation; aerial cameras.

PHOT 365 Cartography — Photogrammetry — Drafting principles as applied to photogrammetric compilation and cartography; inking and scribing techniques; surround detail, lettering and scales; production procedures.

PHOT 367 Photogrammetry 3 — The compilation of a flight plan and detailed specifications for a photogrammetric project; photographic measurements and refinements using a comparator and other instruments; the elements of exterior orientation expressing the space position and angular orientation of a tilted photograph; use of direct optical projection stereoplotters; stereoplotters with mechanical or optical mechanical projection systems and automated stereo plotting instruments; application of on — and off-line projection systems and automatic contouring during orthophoto production; the location of points by intersection from two or more terrestrial photographs.

PHOT 377 Photogrammetry — The geometry and physical nature of the photograph; optics for photogrammetry; principles of photography; dark room procedures; aerial cameras; stereoscopy; the spatial model; comparator measurements of photo-coordinates; planning aerial photography; plotting instruments; classification and operation of stereoplotters; aerial triangulation; photogrammetric control extension, coordinate transformation; use of electronic computers; photo-interpretation; terrestrial and oblique photogrammetry; map compilation; cartography; remote sensing; photogrammetric refinement; general specifications.

PHOT 465 Cartography — Photogrammetry — Drafting principles as applied to photogrammetric compilation and cartography; inking and scribing techniques; surround detail, lettering and scales; production procedures.

PHOT 467 Photogrammetry 4 — Review of geometric projections, inner, relative and absolute orientation. Three dimensional similarity transformation, projective transformation, collinearity transformation, projective transformation, collinearity and coplanarity equations. Restitution instruments — analogue and analytical types. Accuracy of photogrammetric measurement. Aerial triangulation. Photogrammetric products — topographic maps. Orthophoto maps and digital elevation models (DEM).

PHOT 477 Photogrammetry — Coordinate transformations; collinearity and coplanarity equations; accuracy of coordinate determination; aerial triangulation — preparation, measuring and adjustment; applications of photogrammetry to survey and mapping projects; introduction to digital mapping.

PHYS 123 Physics — General topics covered include light and optical instruments, kinematics, statics, dynamics, angular motion, energy, work properties of matter, temperature, thermal properties of matter, wave motion, basic electricity and magnetism and electronic distance measuring. The lab program stresses measurement, data analysis, experimental investigation of physical laws and technical report writing. Mathematical treatment

requires only algebra and trigonometry. Applications of the general topics are relevant to the Surveying Technology.

PHYS 223 Physics — see PHYS 123.

SURV 161 Plane Survey Computations 1 — Mathematical basics; geometry and theorems pertaining to circles; plane trigonometry; angles and bearings; definitions and conversions of angles to bearings and vice versa; coordinate systems; polar and rectangular; inverting; computations of traverses; traverse adjustment by compass and transit rules; locations of gross linear and angular gross errors; area computations by coordinate and DMD methods; UTM traverse computations; missing parts; see SURV 261.

SURV 172 Computer Applications 1 — This course is designed to familiarize the student with the operation of the hand held computer from two perspectives: first, as a calculator to do random computations; second, as a programming tool to solve routine survey problems. Material covered: modes of operation, operator hierarchy, numeric functions, numeric and string variables, array variables, basic statements and commands, program structure, elementary programming and program editing.

SURV 260 Computational Methods for the Field Technician — Review of important geometry theorems and their application to survey. Computations of simple circular curves, and symmetric vertical curves. The solution of problems related to the subdivision of land. The reduction of field acquired measurements.

SURV 261 Plane Survey Computations 2 — Missing parts: different techniques of computations problems on subdivision of land; prismatic and trapezoidal rules of area computations; geometry and elements of circular and compound curves; various methods of curve layout; vertical curve; calculations of areas of cross-sections and earthworks volumes; slope staking; control surveys: intersection and resection; inaccessible base.

SURV 264 Field Survey 2 — An extension of SURV 164 Field Survey 1. Students use techniques developed in large field project where further instrumentation in the form of tachometers, electronic distance measuring equipment is used.

SURV 265 Survey Drafting — Completion of this course will give students the ability to apply drafting fundamentals to the solution of survey problems. Students will acquire skills in: plotting cadastral survey data; drafting plans, profiles and cross-sections; developing simple earth-work diagrams.

SURV 268 Field Survey Techniques — This is an intensified field oriented course. Successful completion will give students the ability to carry-out routine survey tasks. These will include extensive practice in the use of surveyor's levels, theodolites and various types of EDMs.

SURV 272 Computer Applications 2 — A continuation of SURV 172. Topics include BASIC programming for strings, for-next loops, subroutines, data files, introduction to MS-DOS, introduction to word processing, serial communication for hand held computers.

SURV 361 Plane Survey Computations 3 — Geometric spaces in surveying, surveying measurements, propagation of errors, computers and numerical approaches in surveying; computations of control surveys; triangulation, trilateration, traversing, reduction of eccentric measurements, intersection, resection, inaccessible base; transformation of coordinates, partitioning of land, horizontal and vertical curves; integrated surveying; deformations; three dimensional surveying systems.

SURV 362 Geodetic Surveying 1 — Properties of the ellipse and the ellipsoid of revolution; calculation of radii of curvature; spherical excess; Legendre's theorem, method of addends. Field tests; triangle closures, side equations, sine consistency checks; reduction to sea level. Convergence of meridians, computation of geodetic position, forward and inverse. Trigonometric levelling; reciprocal, non-reciprocal, refraction, intervisibility problems.

SURV 363 Adjustments of Survey Measurements — Definitions and classification of errors, measures of precision; propagation law of standard errors; weights and propagation of weights; principle of least squares (in matrix notation); adjustment by variation of parameters; conditional observations; combined adjustments; adjustments of triangulation, trilateration nets, and traversing.

SURV 364 Field Survey 3 — This course introduces the student to the instruments and methods used in carrying out plane and geodetic surveys. The projects are aimed at engineering, hydrographic, mining, legal and precise surveys. The student is introduced to the reduction and presentation of the field data, with the application of computers in some areas.

SURV 365 Drafting and Survey CAD — Topics covered include sequential files, string manipulation, microcomputer graphics, role of CAD in surveying, BASIC and FORTRAN programming for plotters and digitizers, data collector transfers, reduction of field data, coordinate geometry programs, creation of plot files. Surveyor general requirements for survey plans, inking.

SURV 367 Earth Sciences — A study of the forest flora of British Columbia; the characteristics of native trees, their identifying features and common uses. Elementary geology, including the study of rocks and minerals, geologic structures, general location and uses of common ores. Soil classification and location.

SURV 368 Descriptions and Survey Law — This course covers basic Survey Law, land tenure and land registration systems. Land survey systems are examined and the format of descriptions for deeds is outlined—the use of metes and bounds descriptions, together with adjoiners, aliquot parts, centre line descriptions are developed.

SURV 372 Computer Applications 3 — Students will study the FORTRAN language and achieve a moderate proficiency in writing programs for survey computations and graphics. Topics include features of the IBM mainframe, CMS terminal operating systems, XEDIT (Editing Utility), use of the WATIV compiler, fundamentals of the FORTRAN language, FORTRAN 77 compiler, CALCOMP calls, file handling and transfers, IBM PC, FORTRAN compilers.

SURV 374 Field Surveying — Control surveys by triangulation, trilateration and traversing; indirect optical distance measurement; electro-magnetic distance measurements; the gyro-theodolite; trigonometrical and barometric levelling.

SURV 461 Plane Survey Computations 4 — see SURV 361.

SURV 462 Geodetic Surveying 2 — Gravitational and centrifugal force; gravity, gravity measurements and reductions, anomalies, separation of the geoid; precise levelling, orthometric and dynamic heights. Close satellite theory, spherical and rectangular coordinate systems, Doppler positioning by satellite, electronics in surveying, propagation of electromagnetic waves, refraction. B.C. system of integrated surveys, computations in the UTM system, zone to zone transformations.

SURV 463 Mathematical Cartography — Concepts and properties of maps; classifications of maps; theory of distortions; conformality; equivalency; Tissot's indicatrix, conical projections; cylindrical projections; perspective projections; polyconic projection of British Columbia; UTM projection; stereographic projection of New Brunswick.

SURV 464 Field Survey 4 — This course is a survey 'camp' during the final four weeks of term four. The academic requirements for this term will have been covered by this time and the practical or field requirements will be met during the survey 'camp'.

SURV 465 Survey CAD 2 — Topics covered include: data structures, programming for digitizers and plotters, introduction to computer graphics, and algorithms for computer cartography.

SURV 468 Cadastral Surveying — Deals with surveys which do not have to account for curvature of the earth. Analysis of methods and instrumental errors, use of specialized equipment. Application of survey methods to engineering surveys, mining surveys, hydrographic surveys and legal surveys.

SURV 469 Planning and Land Utilization — The planning process as it applies to regional and community planning; the role of various planning authorities and their powers; legislation effecting planning; zoning and its implication for land use and land development; land use studies; the subdivision of land and elementary economics related to land development.

SURV 474 Field Surveying — see SURV 374.

TCOM 111 Technical Communication — In this course, students learn the style and organization of clear technical writing. They write letters and memos, process descriptions and instructions, and design graphics relevant to surveying. They also give an oral report.

TCOM 121 Technical Communication — Under development.

TCOM 212 Technical Communication — In this course, students learn the fundamentals of job seeking, meeting and reporting. They participate in meetings and give an oral technical report. They write resumes, job application letters, technical briefs and proposals and occurrence, trip progress, evaluation and recommendation reports. Prerequisite: TCOM 111.

Wood Products Manufacturing Technology

British Columbia's leading industry is rapidly adopting advanced technology for the production of lumber and plywood. New plants use computerization with automated processes to convert raw material into end products which are in demand on local and world markets.

Job Opportunities

Young men and women with management skills are needed in B.C.'s largest industry to fill positions in supervisory, technical, marketing and sales jobs. Graduates from this technology are found in key jobs throughout B.C.'s wood products industries. Most are employed where management skills are needed as supervisors, foremen, mill managers, sales people and sales managers, traders and quality control technicians or supervisors. Graduates are also employed in many other areas where their management-oriented training is valued.

The Program

First-year students in the Wood Products Program study basic sciences and introductory courses including wood science, log utilization, and lumber tallying and grading. In the second year there is increased emphasis on manufacturing techniques, process control and economics. Second-year courses also emphasize management skills in such applications as computers, mill supervision, sales and distribution, and business communications. Classroom instruction is heavily augmented by field trips to coastal and interior operations.

Prerequisites

Algebra 12 and one Science 11, Biology, Chemistry or Physics are course requirements for this program. Applicants are sought who possess initiative, a sense of responsibility, and an interest in leadership and teamwork within industry. Industrial experience lends strength to an application.

Faculty and Staff

J.T. Neilson, B.A.Sc., P.Eng., Department Head
H. Kettner, Program Head
D.G. Mickey, Dipl.T.

PROGRAM: Wood Products Manufacturing

	Clim hrs/wk
Level 1	
LUPL 101 Wood Science 1	7.0
LUPL 102 Lumber Grading 1	2.0
LUPL 103 Lumber Tallying*	2.0
LUPL 104 Log Utilization	5.0
MATH 146 Basic Technical Mathematics	5.0
MECH 101 Drafting Fundamentals	2.0
PHYS 118 Physics	5.0
TCOM 107 Technical Communication	3.0
Level 2	
CHSC 208 Engineering Materials	3.0
LUPL 108 Lumber Grading 2*	8.0
LUPL 201 Wood Science 2	4.0
MATH 246 Statistics and Quality Control	5.0
MECH 204 Drafting	2.0



PHYS 218 Physics	5.0
TCOM 207 Technical Communication	3.0

Level 3

COMP 121 Computer Applications	3.0
ELEC 257 Electrical Equipment	4.0
LUPL 105 Lumber Manufacture	10.0
LUPL 106 Plywood Manufacture	6.0
LUPL 107 Mill Management 1	2.0
LUPL 202 Summer Technical Report	1.0
OPMT 164 Management Engineering 1	3.0
TCOM 305 Advanced Technical Communication	2.0

Level 4

COMP 283 Linear Programming	3.0
LUPL 109 Mill Management 2	11.0
LUPL 203 Mill Audit and Quality Control	4.0
MECH 416 Mechanical Equipment	3.0
MKTG 420 Wood Products Sales and Distribution	4.0
OPMT 264 Management Engineering 2	4.0
TCOM 403 Advanced Technical Communication	2.0

*The attainment of a recognized industrial certificate with a minimum mark of 70% is required as a condition of graduation.

Course Descriptions

CHSC 208 Engineering Materials — A comparison of materials important to forest products industries including wood and wood products, concrete, metals, alloys, polymers and ceramics. Common causes of failure in service including corrosion, wear, fatigue and embrittlement. Lab sessions emphasize physical and non-destructive testing.

COMP 121 Computer Applications — Computer applications in engineering technologies; how a computer works, recognizing problems suitable for computer solution, flow-charting and communicating with computer personnel. Emphasis is on the use of computers to solve problems related to the technology. Where available, "package" programs are demonstrated and used by students. FORTRAN or BASIC programming language is taught.

COMP 283 Linear Programming — Graphical method; algebraic method; simplex method; analysis of simplex results; LKP problem formulation; use of computer to solve problems; analysis of computer solution; use of reduced costs and shadow prices; sensitivity analysis; practical applications and limitations of LP; implementation of results.

ELEC 257 Electrical Equipment — An introduction to industrial electrical equipment. Topics include AC and DC motors and their application to electro-mechanical drive systems; protecting and controlling motors; industrial electrical power systems and related equipment; sources of energy; transformation into primary and secondary voltage levels, distribution of power throughout the plant; switching; voltage control and power factor correction.

LUPL 101 Wood Science 1 — An introduction to the manufacture of forest products. Topics include elementary botany, identification of British Columbia commercial tree species, macro and micro wood technology and wood defects as they relate to lumber quality. The processing and handling of wood in preparation for lumber manufacturing—debarking, chipping, screening, conveyance and storage.

LUPL 102 Lumber Grading 1 — Given in term 1 in preparation for Lumber Grading 2, the course covers information fundamental to the grading of western softwood lumber including tree growth and wood structure, species identification, classification of products and the recognition of characteristics found naturally, and caused in manufacture.

LUPL 103 Lumber Tallying* — A full course on lumber tallying and shipping, including understanding Foot Board Measure; converting order data to specified lengths, pieces, bundles and packages; calculating wood moisture content and shrinkage; metric conversion and lumber pricing. Final examinations for certification are by the Council of Forest Industries (COFI) during which the student must achieve 70%. A COFI Certificate in Tallying is required to obtain the BCIT Diploma of Technology. Students must also obtain 50% marks during the term of the course given at BCIT.

LUPL 104 Log Utilization — Introduces the basic log-scaling procedures used in coastal mills and also includes different log-sorting methods and recovery calculations used in saw-mill and plywood industries. Considerable time is spent practicing scaling techniques on selected log booms.

LUPL 105 Lumber Manufacture — Methods and equipment used in the manufacture of lumber in the B.C. Coast and Interior are examined. Processes discussed include log preparation, initial and secondary breakdown, kiln drying and planing. Saw feeds, speeds and filing practices are also examined. Field trips augment material given in lectures.

LUPL 106 Plywood Manufacture — Methods and equipment used in the manufacture of plywood in the B.C. Coast and Interior are examined. Processes discussed include peeling, driving, lay-up and finishing. Some time is spent discussing other types of panel boards and related coatings and overlays. Field trips augment material given in lectures.

LUPL 107 Mill Management 1 — This course is designed to supplement material covered in courses on lumber and plywood manufacture. Topics include cost analysis, principles of supervision, accident prevention, fire prevention, industrial relations, maintenance organization, maintenance trades, mobile equipment, materials handling and pollution abatement. A large portion of time is spent on specific assignments in various manufacturing plants.

LUPL 108 Lumber Grading 2* — Students attend industry lumber grading classes sponsored by the Council of Forest Industries (COFI) and receive further instruction at BCIT. Final examinations for certification are given by COFI, at which time the student must achieve a 70% pass mark as a requisite to obtaining the BCIT Diploma of Technology. Students must also obtain the required 50% term marks for the in-school portion of the course.

LUPL 109 Mill Management 2 — see LUPL 107.

LUPL 201 Wood Science 2 — Topics covered include wood and chip units and conversion factors, mechanical and rheological properties, micro— and ultra-structure, wood protection and preservation. The lab section of the course is largely made up of a research project, with emphasis on reporting of methods and results. Prerequisite: LUPL 101.

LUPL 202 Summer Technical Report — Students make a detailed report on one phase of the technical operation of a forest products plant, from first-hand experience or from approved research sources.

LUPL 203 Mill Audit and Quality Control — Lectures and labs complement material given in Lumber and Plywood Manufacture courses and provide the student with the capability to set up and manage a quality control program in a sawmill and plywood plant. Besides being able to identify and correct problems related to quality, the student will be able to sample, analyze and report on size accuracy, fibre usage, product dryness and adherence to standards. Prerequisite: LUPL 105, LUPL 106.

MATH 146 Basic Technical Mathematics for Wood Products — Graphical linear programming. Exponential/logarithmic theory and transformations, common and natural logarithms and logarithmic/semilogarithmic graphs. Radian measure. Trigonometric functions of any angle, vectors and solution of triangles, graphs of trigonometric functions, identities, compound and double angle formulas, trigonometric equations and inverse functions.

MATH 246 Statistics and Quality Control for Wood Products — Organization and graphical presentation of data, frequency distributions, measures of central tendency, variation and other measures. Probability theory and laws. Random variables, discrete and continuous theoretical distributions. Sampling, estimation and hypothesis testing with both large and small samples. Method of least squares, regression and correlation. Analysis of variance. Control charts concepts and application, and acceptance sampling. Non-parametric statistics.

MECH 101 Drafting Fundamentals — An introductory course for persons with little or no experience in graphics. (Students are required to purchase drafting equipment and supplies on the first night of class) Students learn to produce and read simple drawings. Topics include scales, geometric constructions, basic orthographics detail interpretation, line visibility, dimensioning, auxiliary views, true shape, inclined and skew surfaces, sections, pictorials, working drawings and freehand sketches.

MECH 204 Drafting (Lumber and Plywood) — Covers topics on intersections, developments, descriptive geometry, isometrics and piping, drawings and mechanical equipment detail, and layout projects associated with lumber production.

MECH 416 Mechanical Equipment (Lumber) — A study of mechanical equipment relating to the transmission, application and control of power, with particular reference to the wood processing industry. Topics include line shafting, flexible couplings, V-belt and roller chain drives, gearing, variable speed drives;

hydraulic and pneumatic systems, centrifugal pump applications and lubrication and bearings.

MKTG 420 Wood Products Sales and Distribution — Examines the major domestic and export markets for lumber and plywood, including ongoing changes in all types of distribution and transportation systems used by the forest products industry. The sales process, from telephone solicitation to complete documentation of FOB and CIF orders, is covered in detail.

OPMT 164 Management Engineering 1 — Wood Products — An organized approach to problem-solving, with emphasis on the forest products industry. Method study techniques such as problem selection, process charting, multiple activity charting, activity sampling, motion economy and critical examination and development of alternatives are covered. The course also includes an introduction to work measurement. The importance of establishing good human relations with employees is stressed throughout.

OPMT 264 Management Engineering 2 — Wood Products — The techniques required to solve plant layout and materials handling problems are covered and the student applies these techniques to a comprehensive in-house project. As a term project, the student selects for study a job in an industrial plant in the forest products industry. The student applies the techniques learned in OPMT 164 and the first part of this course to the solution of a plant project and submits a written report on the findings, including conclusions and recommendations.

PHYS 118 Physics for Wood Products — An introductory course covering statics, dynamics, momentum, force, friction, energy, power, angular momentum, simple machines, properties of solids, fluids, fluid mechanics, thermal properties of matter, thermal energy, basic electricity and magnetism, optics and atomic and nuclear phenomena.

PHYS 218 Physics for Wood Products — see PHYS 118.

TCOM 107 Technical Communication for Wood Products — Prepares students for writing technical material relevant to the lumber and plywood industry. Students study and practice the principles of clear, concise and precise writing and apply those principles to instructions, field trip reports, process descriptions, memos and descriptions of hardware. In addition, students practice oral communication skills.

TCOM 207 Technical Communication for Wood Products — Further prepares students for writing for the lumber and plywood industry. Students write letters, job application letters, resumes, proposals, progress reports and a technical report done jointly with an engineering course. Students also learn interview techniques. Prerequisite: TCOM 107.

TCOM 305 Advanced Technical Communication for Wood Products — Students review and practice technical reporting. They write several memos and a Summer Technical Report which is marked jointly by the instructor and people employed in the lumber and plywood industry. They practice illustrating, revising and editing skills, and present an oral technical report. Prerequisite: TCOM 107, TCOM 207.

TCOM 403 Advanced Technical Communication for Wood Products — Students write technically advanced material typical of the forest products industry. They update their resumes and job application letters and write technical definitions and descriptions, procedures, instructions, trip reports and technical letters. They write one long report based on observations in a mill, in conjunction with an engineering course. Prerequisite: TCOM 107, TCOM 207, TCOM 305.

School of Health Science Studies

Office of the Dean

Brian Gillespie, Ed.D., Dean

Kathleen Bach, B.A., Administrative Assistant/Executive Secretary
to the Dean

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Basic Health Sciences

Department of Basic Health Sciences

This department provides courses in human anatomy and physiology, immunology, microbiology, pathophysiology, sociology, organizational psychology, and human development for students enrolled in the School of Health Sciences. These courses are designated by the prefix BHSC and are listed and described in the following health technology entries. Each course is oriented towards a particular technology so that, although the material studied may be introductory in nature, the student quickly becomes aware of applications. In many cases these courses are the foundation upon which specific technology subjects are built. The department's responsibility, therefore, is to teach those concepts of biological and behavioral sciences which provide the student and graduate with the knowledge and comprehension to meet the present and the future challenges of the modern health worker.

Faculty and Staff

D. W. Martin, B.Sc (Hons), M.S.R., Department Head
B. M. Alder, B.S.N., R.N., M.A.
R. Bakan, B.A., M.A., Ph.D.,
J. H. Emes, B.Sc (Hons.), M.Sc., Ph.D.
A. G. Handford, B.A.
G. R. Marshall, B.Sc (Kines.), M.Sc. (Kines.)
T. J. Nowak, B.A., Dipl.Ed.
E. Shkurhan, B.Sc., M.Sc., Chief Instructor



Environmental Health Technology

Department of Environmental Health Services

Public Health Inspector Training

The public health inspector is a vital member of the community health delivery system. His or her role includes improving the environment through the use of education, consultation, inspection and monitoring techniques and, if necessary, by the enforcement of health legislation. This role is applied in the areas of food hygiene, insect and rodent control, communicable disease investigation, public accommodation, community care facilities, public recreational facilities, water supply and waste disposal systems, occupational health and safety and environmental pollution — air, water, soil and noise. The graduate provides leadership and technical expertise in the development of long-range planning to protect and improve community health. To meet these demands the candidate must be a mature, practical person and possess excellent communicative skills, as well as considerable tact and discretion in working with people at all levels within the community.

Job Opportunities

Employment possibilities for public health inspectors include municipal, provincial and national health agencies, environmental and pollution control agencies and private businesses and industries such as food processing, catering and fisheries. Occasional openings occur in the teaching field. Employment opportunities exist in the industrial health and hygiene area for students who also possess an undergraduate degree.

The Program

The cross-disciplinary curriculum includes general studies in health and the health engineering sciences, math and the physical and social sciences, in order to give students a thorough understanding of the many health hazards in the environment and to equip them to measure, evaluate and recommend controls for these hazards. Instructional modes include lectures, labs and field experience.

Prerequisites

Algebra 12, Physics 11 and Chemistry 12 are course requirements for this program. Applicants must be in good health. The nature of the work precludes individuals who are severely handicapped. Applicants should be able to show evidence of maturity, have a positive outlook and be interested in serving the community. Acceptance is dependent on a preselection interview.

Post-graduation

After completing the requirements of the two-year program leading to a Diploma of Technology, graduates must complete six months of field training in a recognized health unit under the direction of a medical health officer and a public health inspector. Successful candidates may then sit a national examination to qualify for a Certificate in Public Health Inspection (Canada) granted by the Board of Certification of the Canadian Institute of Public Health Inspectors.



Faculty and Staff

John M. Pelton, B.A., C.P.H.I. (C), Department Head
E.J. Borsky, Dipl.T.
B. Price, C.P.H.I.(C)
C.L. Young, C.E.T, C.P.H.I. (C)

PROGRAM: Environmental Health

		Clim hrs/wk
Level 1		
BHSC 123	Public Health and Pollution Control	
	Microbiology	3.0
CHEM 108	General Chemistry for Environmental	
	Health	6.0
ENVH 124	Pest Control	2.5
ENVH 141	Food Hygiene 1	4.0
ENVH 142	Public Health Inspection 1	4.0
ENVH 143	Environmental Health and Engineering 1..	4.0
HCOM 106	Communication for Environmental and	
	Occupational Health.....	3.0
MATH 182	Basic Technical Mathematics for	
	Environmental Health	4.0
Level 2		
BHSC 204	Basic Anatomy and Physiology	2.0
BHSC 223	Public Health and Pollution Control	
	Microbiology	3.0
CHEM 208	General Chemistry for Environmental	
	Health	6.0
ENVH 231	Food Hygiene 2.....	2.0
ENVH 232	Public Health Inspection 2.....	2.0
ENVH 266	Epidemiology and Bio Statistics.....	4.0
ENVH 275	Drinking Water and Waste Disposal.....	5.0
HCOM 205	Communication for Environmental and	
	Occupational Health.....	3.0
PHYS 212	Environmental Physics	3.5

Level 3		Clim hrs/wk
CHEM 313	Instrumental Analytical Methods for Environmental Health	4.0
ENVH 331	Food Hygiene 3.....	2.0
ENVH 332	Public Health Inspection 3.....	2.0
ENVH 337	Public Health Administration 1	2.0
ENVH 350	Environmental Noise	4.0
ENVH 358	Environmental Health Relations.....	5.0
ENVH 379	Technical Research Methods 1	7.0
Level 4		
BHSC 424	Communicable Disease Control.....	4.0
CHEM 418	Industrial Chemical Processes	2.0
CHSC 413	Environmental Analytical Methods	3.0
ENVH 437	Public Health Administration 2	2.0
ENVH 453	Environmental Health and Engineering 2..	3.0
ENVH 456	Public Health Law.....	3.0
ENVH 459	Technical Research Methods 2.....	3.0
ENVH 470	Industrial Hygiene and Toxicology	5.0
ENVH 471	Food Hygiene 4.....	5.0

Course Descriptions

BHSC 123 Public Health and Pollution Control Microbiology — An introduction to those areas of microbiology which the public health inspector will use in his or her daily work. The areas include the structure and physiological characteristics of bacteria, viruses and fungi and their significance to food, water, sewage and waste disposal.

BHSC 204 Basic Anatomy and Physiology — Designed to provide a basic knowledge of human anatomy and physiology. Emphasis is placed on the physiology of human body systems and how environmental factors affect these systems.

BHSC 223 Public Health and Pollution Control Microbiology — see BHSC 123. Prerequisite: BHSC 123.

BHSC 424 Communicable Disease Control — Provides the student with a sound knowledge of the natural history, spread and control of communicable diseases. Emphasis is placed on modes of transmission and control of diseases of provincial and national importance.

CHEM 108 Chemistry for Environmental Health 1 — A general chemistry course for environmental health. Topics include chemical symbols, formula acid base reactions, calculation based on formulae and chemical equations. Theory of volumetric analysis molarity, normality calculations based on concentration of solutions. Acid base equilibria solution, PH and POH, buffers and hydrolysis.

CHEM 208 Chemistry for Environmental Health 2 — An introduction to organic biochemistry, and a selection of topics of interest to Environmental Health. Organic covers functional group analysis, naming by IUPAC, common name and trade names of many commercial chemicals, oil refining, photochemical smog; pesticides. Biochemistry covers lipids, carbohydrates and proteins. Other topics include alkalinity, hardness, water softening, surfactants, heavy metal poisoning, chemical toxicity, biological oxygen demand, chemical oxygen demand and swimming pool chemistry. Prerequisite: CHEM 108.

CHEM 313 Instrumental Analytical Methods for Environmental Health — Principles and laboratory procedures of the more common instrumental methods of chemical analysis: spectroscopic methods including visible, ultraviolet and infra-red spectroscopy. Atomic absorption spectroscopy, flame photometry, potentiometry, polarography and chromatography. Prerequisite: CHEM 208.

CHEM 418 Industrial Chemical Processes — Designed to give the student an overview of the chemical processes used in industry, the chemicals used, chemical reactions, products manufactured, waste products, pollutants produced and the hazards to personnel. Students will make field trips to selected industries. Prerequisite: CHEM 108.

CHSC 413 Environmental Analytical Methods — Surveys suitable methods of examining many types of water, waste water and materials related to control of water quality. Typical industrial pollution problems related to local industry are discussed during the lab periods and special attention is given to proper sampling techniques. A selection is made from the following analysis of field samples; cyanide, pesticides, arsenic, mercury, nitrogen (ammonia, nitrate, organic), oxygen (D.O., B.O.D., C.O.D.), surfactants, phosphates, sulphates, chlorides, proteins, carbohydrates, lignin, phenols and heavy metals. Two field trips are included.

ENVH 124 Pest Control — With primary emphasis on insects and rodents, this course will examine the identification and life cycles and habits of pests in order to understand the various measures for their control.

ENVH 141 Food Hygiene 1 — The food hygiene courses will examine the public health concerns associated with the food industry. Specific attention will be directed to legislative control and enforcement, inspection techniques, causes and investigation of food-borne illnesses, microbiological concerns and educational programs, as all of these are applied to the food industry in production, processing, handling, storage, service display, construction and materials.

ENVH 142 Public Health Inspection 1 — Provides the student with a knowledge of duties and responsibilities in government organizations. A detailed review of related environmental and health legislation will be covered, as well as the division of control and authority at the federal, provincial and local levels. Control techniques and methodology used by government organizations is stressed.

ENVH 143 Environmental Health and Engineering 1 — Covers a number of topics relevant to the field of environmental health including solid waste collection and disposal, emergency measures, camp and recreational sanitation, housing, community planning and swimming pools.

ENVH 231 Food Hygiene 2 — See ENVH 141.

ENVH 232 Public Health Inspection — See ENVH 142.

ENVH 266 Epidemiology and Bio Statistics — This course enables the student to apply epidemiologic principles to assess the distribution and causes of disease in the population and to use biostatistical methods to critically evaluate data and study conclusions.

ENVH 275 Drinking Water and Waste Disposal — An introductory course which examines the means, methods, design and construction of facilities required to provide adequate potable water and sewage disposal. Associated health hazards, protective measures and how to solve problems encountered in individual systems will be considered. Further topics will include the characteristics of, and disposal methods for, agricultural wastes.

ENVH 331 Food Hygiene 3 — See ENVH 141.

ENVH 332 Public Health Inspection 3 — See ENVH 142.

ENVH 337 Public Health Administration 1 — This is a survey course which examines the principles of organization behavior, organization and design. The theoretical aspects of public health

administration will be examined, showing the administrative philosophies from the classical school of administration to present-day philosophy. These administrative concepts will be dealt with as they apply to the functioning of government agencies and health departments. Particular reference will be made to Canadian government organization.

ENVH 350 Environmental Noise — Covers noise topics relevant to the field of environmental health with emphasis on occupational and community noise assessment and control. The lab course will emphasize audiometry, noise measurement and analysis, and calibration techniques utilizing state-of-the-art instrumentation. Prerequisite: MATH 182 or PHYS 212.

ENVH 358 Environmental Health Relations — Examines the interrelationships and interactions between various government departments, agencies and corporations. Additionally, the forces which underly the social behavior of groups, large organizations and communities will be examined. Interpersonal relations will be exemplified through the practical application of public health education and the interaction of personnel in the environmental health field. Principles of public relations will also be examined with emphasis on problems peculiar to public health.

ENVH 379 Technical Research Methods 1 — Provides for the development of the research methods and communication skills necessary to design technical research reports. Special emphasis will be placed on predicting trends in the field of public health. This course is designed to encourage the student to be self-assertive and creative. Prerequisite: ENVH 266.

ENVH 437 Public Health Administration 2 — See ENVH 337.

ENVH 453 Environmental Health and Engineering 2 — See ENVH 143.

ENVH 456 Public Health Law — An examination of the legal system which serves our society, followed by a detailed look at certain areas of substantive law which the public health official is likely to come in contact with in carrying out his or her duties. Special attention will be given to that body of legislation designed for the protection and promotion of individual and community health. Court procedure and evidence giving are examined in depth.

ENVH 459 Technical Research Methods 2 — See ENVH 379. Prerequisite: ENVH 202.

ENVH 470 Industrial Hygiene and Toxicology — A survey course in occupational health. Given lectures, laboratory exercises and field situations, the student will be able to recognize common occupational health hazards, demonstrate how to use appropriate environmental sampling equipment and recommend control measures which may alleviate potential health hazards.

ENVH 471 Food Hygiene 4 — See ENVH 141.

HCOM 106 Communication for Environmental and Occupational Health — This applied course introduces students to the communication needs of professionals working in the environmental and occupational health and safety fields. It includes organizing information, writing public relations letters, procedures and literature reviews. Students also deliver a short oral training session on an environmental or occupational health and safety topic.

HCOM 205 Communication for Environmental and Occupational Health — Builds on skills taught in HCOM 106 and adds incident, inspection and investigation reports, proposals and a professional job application package. Meetings and interviewing

skills are also covered. Students will propose, design and sell a training module for an environmental health or occupational health and safety topic.

MATH 182 Basic Technical Mathematics for Environmental Health — Systems of measurement and mensuration. Linear and quadratic equations and systems of linear equations. Functions and their graphs including power functions. Exponential/logarithmic theory, common and natural logarithms, logarithmic/semilogarithmic graphs and exponential growth and decay.

PHYS 212 Environmental Physics — An introduction to the physical principles, properties and relationships of physical quantities and how they affect each other. Motion, force, energy, power, properties of matter, thermal energy, electricity, wave motion, sound light and radiation as they apply to environmental topics. The lab program emphasizes measurements, data analysis and experimental techniques while confirming and expanding the lecture concepts.

Occupational Health and Safety Technology

Department of Environmental Health Services

One of the primary purposes of this program is to graduate individuals who are able to provide the knowledge and leadership necessary to develop programs in industry that will assist in conserving life, health and property. They will consult with company and labour officials on ways to improve productivity by implementing loss control programs. Graduates will also identify health and safety hazards in the work environment and advise corrective action. The occupational health and safety officer will assume a major role in the development and conduct of safety-training programs for workers. Accidents will be investigated to identify their root causes, and methods found to eliminate recurrences.

To achieve these career objectives the applicant is expected to be a mature, objective person who possesses the ability to communicate decisions and goals in a tactful and professional manner.

Job Opportunities

Career openings are found in industries and regulatory agencies where the health and safety of the workers is of concern.

The Program

The science-oriented program includes combined studies in the health, engineering and business fields. This ideal combination prepares the student to understand the potential safety and health hazards of the work environment, as well as the human relations involved in seeking beneficial solution or methods of improving the workplace environment.

Prerequisites

Algebra 12, Chemistry 11 and Physics 11. Candidates will be interviewed.

Faculty and Staff

John M. Pelton, B.A., C.P.H.I. (C), Department Head
Lars G. Larsson, C.R.S.P., Program Head

PROGRAM: Occupational Health and Safety

	Cirm hrs/wk
Level 1	
ADMN 161 Introduction to Microcomputers	3.0
CHEM 115 Chemistry (Fundamental Principles)	6.0
HCOM 106 Communication and Technical Report Writing 1	3.0
MATH 188 Basic Mathematics	4.0
OH&S 142 Policies in Industrial Health and Safety	3.0
OH&S 161 Principles of Accident Prevention	5.0
PHYS 114 Physics for Occupational Health and Safety	5.0
Library and Research	6.0
	<hr/> 35.0



	Cirm hrs/wk
Level 2	
ADMN 261 Software Systems	2.0
BHSC 207 Anatomy and Physiology	2.0
CHEM 215 Chemistry 2	5.0
CHSC 288 Engineering Concepts 1	4.0
HCOM 205 Communication and Technical Report Writing 2	3.0
MATH 288 Applied Mathematics 2	4.0
OH&S 271 Principles of Accident Prevention 2	4.5
PHYS 214 Physics	5.0
Library and Research	5.5
	<hr/> 35.0

Level 3	
ADMN 333 Industrial Relations	3.0
BLDG 121 Drafting and Blueprint Reading	3.0
CHEM 315 Organic Chemistry	6.0
CHSC 388 Engineering Concepts 2	4.0
OH&S 343 Industrial Hygiene 1 — Noise and Vibration	3.0
OH&S 364 Fire Protection	5.0
OPMT 181 Ergonomics	5.0
Library and Research	6.0
	<hr/> 35.0

Level 4	
ADMN 224 Management for Occupational Health and Safety	1.5
ADMN 424 Personnel Management	1.5
CHEM 418 Industrial Chemical Processes	3.0
HCOM 302 Communication and Technical Report Writing 3	2.0
MECH 206 Mechanics of Materials	4.0
OH&S 436 Occupational Diseases	2.0
OH&S 447 Security Systems	2.0
OH&S 465 Fundamentals of Electric Power and Electric Machinery	4.0
OH&S 473 Industrial Hygiene 2 — Toxicology	5.0
OH&S 478 Loss Control and Auditing	4.0
Library and Research	6.0
	<hr/> 35.0

Course Descriptions

ADMN 161 Introduction to Microcomputers — Gives students a basic understanding of the microcomputer and available software. It provides hands-on experience in using various software packages such as word processing and spread sheets as well as the application of software to the field of Occupational Health and Safety.

ADMN 224 Management for Occupational Health and Safety — Studies behaviour and attitudes in an organizational setting. Topics include the organization's effect on personal perceptions, feelings and actions, and their effect on the organization, as well as the individual's effect on the achievement of the organization's purposes. Concepts such as leadership, communications, power, authority, change and conflict are examined. Will also give the fundamentals of personnel management including human resource planning; recruiting and selection techniques; job analysis, descriptions and evaluation; compensation administration; performance appraisal systems; training; employee safety and health. Current employment legislation is also reviewed.

ADMN 333 Industrial Relations — An introductory analysis of the fundamental issues and facts of labor-management relations. Special emphasis is given to collective agreement content and interpretation, bargaining and basic labor economics.

BHSC 207 Basic Anatomy and Physiology — A study of basic human anatomy and physiology and homeostatic principles. Emphasis is placed on the ways in which the body adapts to external changes, and the problems which attend extreme changes in various work environments.

ADMN 261 Software Systems — See ADMN 161.

ADMN 424 Personnel Management — See ADMN 224.

BLDG 121 Drafting and Blueprint Reading — Incorporation and interpretation of applicable safety regulations in construction drawings, with respect to plant design, lighting, heating, ventilating, air conditioning, fire control, machine details and guards.

CHEM 115 General Chemistry for Occupational Health and Safety — For lecture portion, see CHEM 103. A separate laboratory section is given, specifically for occupational health and safety.

CHEM 215 General Chemistry for Occupational Health and Safety — A continuation of general chemistry topics, using examples drawn from material relevant to the technology: electro-chemistry and hazards in extraction, refining and plating industries; acids, bases and corrosive substances; complex ion formation and metal ion toxicity; dust, vapors, liquids and pulmonary hazards; thermochemistry and flammability; chemical kinetics and explosions; radionuclides. Laboratory exercises will reinforce the basic principles in most of these topics. Prerequisite: CHEM 115.

CHEM 315 Organic Chemistry for Occupational Health and Safety — Surveys the various classes of organic compounds likely to be encountered in the workplace. Naming, structure, chemical and physical properties, hazards and handling precautions are emphasized. Practical work provides experience with organic compounds and processes. Prerequisite: CHEM 215.

CHEM 418 Industrial Chemical Processes — Designed to give the student an overview of the chemical processes used in industry, the chemicals used, chemical reactions, products man-

ufactured, waste products, pollutants produced and the hazards to personnel. Students will make field trips to selected industries. Prerequisite: CHEM 108.

CHSC 288 Engineering Concepts — Covers test procedures for mechanical properties; non-destructive testing and failure analysis; the basic concepts of engineering materials including metals, alloys, plastics, woods, ceramics and concrete.

CHSC 388 Engineering Concepts — See CHSC 288.

HCOM 106 Communication for Environmental and Occupational Health — This applied course introduces students to the communication needs of professionals working in the environmental and occupational health and safety fields. It includes organizing information, writing public relations letters, procedures and literature reviews. Students also deliver a short oral training session on an environmental or occupational health and safety topic.

HCOM 205 Communication for Environmental and Occupational Health — Builds on skills taught in HCOM 106 and adds incident, inspection and investigation reports, proposals and a professional job application package. Meetings and interviewing skills are also covered. Students will propose, design and sell a training module for an environmental health or occupational health and safety topic.

HCOM 302 Advanced Communication for Occupational Health — This advanced project course is designed to complement the industry audit done in second year. Students will analyse and write safety policies and procedures, design a safety audit questionnaire, write a recommendation report (based on audit) and propose a safety program outline. They will also present their reports and a segment of their safety program orally. Students will work with industry representatives, handle correspondence, conduct interviews in industry and word process their reports.

MATH 188 Basic Technical Mathematics 1 — Systems of measurement and mensuration. Linear and quadratic equations and systems of linear equations. Functions and their graphs including power functions. Exponential/logarithmic theory, common and natural logarithms, logarithmic/semilogarithmic graphs and exponential growth and decay.

MATH 288 Applied Mathematics — Organization and graphical presentation of data, frequency distributions, measures of central tendency and variation. Probability theory and laws. Discrete and continuous theoretical distributions. Sampling, estimation and hypothesis testing with both large and small samples. Method of least squares, regression and correlation. Chi-square test.

MECH 206 Mechanics of Materials — Stress, strain and deflection. Tension, compression, shear, torsion, deflection and buckling of material under load. Beams, columns, shafts, thin- and thick-walled cylinders, riveted and welded joints.

OH&S 142 Policies in Industrial Health and Safety — Deals with legislation relevant to the safety field, claims management, safety policies, the concept of workers' compensation, the structure of the Workers' Compensation Board, appeals procedures, the right to know, the right to refuse and the right to participate.

OH&S 161 Principles of Accident Prevention 1 — Covers the history of the safety movement, a management approach to accident prevention, the root causes and real costs of accidents, accident investigation, inspections, job safety analysis, maintaining interest in safety, special problem solutions, motivation, the problem employee, and off-the-job safety.

OH&S 271 Principles of Accident Prevention 2 — Covers accident prevention for industrial operations. The engineering and technology involved in the various operations is examined. Topics include industrial buildings and plant layouts; construction and maintenance; manual handling and material storage; hoisting apparatus and conveyors, ropes, chains and slings; powered industrial trucks; elevators; principles of guarding; woodworking and metal working machinery; cold forming of metals; hot working of metals; welding and cutting; heating and ventilation.

OH&S 343 Industrial Hygiene 1 — Noise and Vibration — Reviews relevant topics in acoustics, audiometry, noise dosimetry and noise control within buildings. The student will be introduced to basic methods of sound measurement and the assessment of hearing loss. At the end of this course, the student will be able to estimate noise in the work environment and recommend simple sound control measures associated with the use of enclosures, damping and absorbent materials. Prerequisite: Year 1 of the Occupational Health and Safety program, or permission of the instructor, MATH 188 or PHYS 114.

OH&S 364 Fire Protection — Deals with the concept of Fire Prevention. Topics include: the handling and storage of flammable and combustible liquids, chemical hazards, dust explosions, bleve, electrical hazards, construction features, chemistry of fire, fire detection, portable extinguishers, automatic sprinkler systems and inspection procedures.

OH&S 436 Occupational Diseases — Provides the student with an overview of occupational diseases in terms of their causes and prevalence, methods of spread and their prevention. There is discussion of the responsibility of the worker and various professionals as well as the worker in the management of occupational diseases of the lungs which are commonly experienced by workers in B.C. There is discussion on a wide range of problems from contaminated water, food supplies, to scabies and causes of silicosis and "white fingers" disease.

OH&S 447 Security Systems — A basic security program, including threat assessment, physical and electronic barriers, key control, security lighting procedures. Data security, robbery, shoplifting and guard services.

OH&S 465 Electrical Power and Machinery — An introductory course in electrical power and machinery with emphasis on safety aspects. Topics include electrical technology, insulators, conductors, magnetism, capacitors, transformers, Canadian Electrical Code, motors, generators, high voltage, hazardous locations, overload, electrical injuries, grounding, lock-out procedures and limits of approach. Prerequisite: MATH 283.

OH&S 473 Industrial Hygiene 2 — Toxicology — This basic course allows the student to identify, monitor, evaluate and recommend control measures for common chemical and physical hazards in the work place. The first part of the course reviews the concepts of toxicity and hazard as they apply to the development of permissible levels. The toxicity of common gases, vapours, dusts and fumes is reviewed. The second part of the course discusses the hazards associated with excessive exposure to ionizing and non-ionizing radiation, temperature and pressure extremes.

OH&S 478 Loss Control and Auditing — Is designed to teach the student how to make a complete safety program evaluation and design a safety program in a real life situation. The course also covers transportation of dangerous goods, emergency planning, risk management, how to measure the success of a safety program and total loss control.

OPMT 181 Ergonomics — Ergonomics concentrates on human

factors in the scientific study of people at work, especially regarding worker safety, health, efficiency and comfort. The course explores recent trends in the ergonomics field in relation to the physical working environment, adaptation of tools and workplace to the worker, equipment design, impact on productivity and viewpoints of both workers and management.

PHYS 114 Physics for Occupational Health and Safety — An introductory level course covering kinematics, dynamics, friction, statics, angular motion, energy, momentum, simple harmonic motion, wave motion and sound, electromagnetic waves, physical optics, basic electricity and magnetism, temperature and heat, thermal properties of matter fluid mechanics, atomic and nuclear phenomena. The lab program stresses measurement, data analysis, experimental technique and report writing. Mathematical treatment requires algebra and trigonometry.

PHYS 214 Physics — See PHYS 114.

Biomedical Electronics Technology

Program Objectives

The objective of the program is to graduate technologists with the ability to ensure safe and correct performance of equipment used in medicine and biology. The curriculum covers physiologic monitors, defibrillators, electrosurgery units, chemistry and clinical laboratory instrumentation, radiology equipment, ultrasound imaging machines and other electro-medical diagnostic and therapeutic devices.

Employment Opportunities

Graduates of the Biomedical Electronics program may be employed in hospitals, clinics, research labs and medical equipment sales and service organizations.

Biomedical Electronics Technologists may be responsible for scheduled and corrective maintenance and safety inspection of electro-medical equipment, as well as participate in research and development, purchase specification, equipment evaluation and operator training.

The Program

The Biomedical Electronics Program provides education and training in the following subject areas: technical communications; algebra; calculus; statistics; basic chemistry, organic chemistry, bio chemistry and analytical chemistry; human anatomy and physiology; biophysics; electricity and electronics; biomedical electronics; digital techniques and microprocessor applications. This exposure allows the graduate to work in close association with biomedical engineers, physicians and others who use, maintain, design and supply scientific and medical equipment. During the second year, each student spends four weeks in supervised clinical training in a local hospital, research agency or equipment supply firm.

Throughout the program, emphasis is placed on practically-oriented instruction. "Hands-on" laboratory experience is provided and students are trained in engineering problem-solving methodology to allow them to upgrade and maintain their knowledge.

A professional attitude is encouraged throughout the program. Memberships in the Applied Science Technologists and Technicians of British Columbia (ASTTBC) and the Canadian Medical and Biological Engineering Society (CMBES) are recommended.

The Biomedical Electronics program is nationally accredited by ASTTBC. Graduates are eligible for registration as Applied Science Technologists (A.Sc.T.) after two years of relevant work experience following graduation.

Prerequisite

- High School graduation with a minimum of C+ standing in Algebra 12, Physics 11 and Chemistry 11.
- Selection interview with program instructors.
- Applicants with relevant practical experience or special background may be considered.



Faculty and Staff

George Eisler, M.A.Sc., PEng., M.B.A., Department Head
 M.J. Barrett, Dipl.T., C.E.T., A. Sc.T.
 P.K. Chiu, B.Eng., M.Sc., Ph.D., PEng.
 N. Fong, B.Sc., B.A.Sc., PEng., C.C.E., Program Head
 D. Moreau, B.Sc., Dipl.T.
 A. Nichols, B.A.Sc., PEng.

PROGRAM: Biomedical Electronics

Level 1		Credit
BMET 100	Electronics Principles and Practice 1	9.0
CHEM 107	Chemistry for Biomedical Electronics	6.0
ELEC 152	Measurement for Biomedical Electronics ..	4.0
HCOM 104	Technical Writing for Biomedical Electronics	3.0
MATH 178	Basic Technical Mathematics for Biomedical Electronics	8.0
Level 2		
BHSC 202	Human Anatomy and Physiology	9.0
BMET 200	Electronics Principles and Practice 2	2.0
CHEM 207	Introduction to Organic Biochemistry	7.5
GNNU 182	Introduction to Patient Care	1.5
HCOM 203	Technical Writing for Biomedical Electronics	3.0
MATH 278	Calculus for Biomedical Electronics	12.0

Level 3

BMET 300	Electronics Principles and Practice 3.....	6.0
BMET 301	Biomedical Electronics 1	7.0
BMET 310	Digital Electronics 1	8.0
ELEC 252	Measurement for Biomedical Electronics..	4.0
MATH 378	Statistics for Biomedical Electronics	2.0
PHYS 324	Biophysics	3.0

Level 4

BMET 401	Biomedical Electronics 2.....	6.0
BMET 402	Biomedical Electronics Project	3.0
BMET 403	Medical Imaging.....	5.0
BMET 410	Digital Systems and Microprocessors	8.0
BMET 420	Practical Experience in Biomedical Electronics	15.0
CHEM 411	Instrumental Analysis for Biomedical Electronics	4.0
ELEC 259	Video Fundamentals	3.0
HCOM 301	Advanced Communication for Biomedical Electronics.....	1.0

Most courses taken within the program require successful completion of certain prerequisites. For further information contact the Registrar's Office.

Course Descriptions

BHSC 202 Human Anatomy and Physiology — The basic structure and function of the human body is discussed using the systems approach. The cell's role as the unit of structure and function is emphasized. Emphasis is also placed on the regulation of body functions and the role of control systems in homeostasis. Examples of the uses of biomedical instrumentation in diagnosis and treatment are given.

BMET 100 Electronics Principles and Practice 1 — Provides students with basic knowledge of electrical quantities, their units and relationships. The course includes DC circuit analysis techniques for R, RC, RL and RLC circuits; AC circuit analysis for R, RC, RL circuits. Examples of applications to biomedical electronics are included. Lab exercises are coordinated with course content.

BMET 200 Electronics Principles and Practice 2 — Analyzes the properties of passive RLC circuits and introduces basic active devices and integrated circuits. Topics include RLC resonant circuits, bipolar transistor and FET fundamentals, discrete amplifier circuits (single and multistage), amplifier stability, Miller effect, power amplifiers, oscillators, power supplies, regulators, IC regulators, differential amplifiers. Prerequisite: BMET 100.

BMET 300 Electronics Principles and Practice 3 — Covers topics such as integrated circuit components and the uses of various other semiconductor components, e.g. Op Amp, FET, SCR, opto-electronics components, timers, etc. Lab exercises are coordinated with course content. Prerequisite: BMET 200.

BMET 301 Biomedical Electronics 1 — Introduces students to basic properties of biomedical signals: collecting (transducers), processing, displaying and recording. The design, construction and operation of physiological diagnostic/monitoring equipment will be presented through both block and schematic diagrams. Electrical safety, as it relates to biomedical equipment and patient care environments, will be emphasized throughout the course. Equipment control and work environment considerations are included. Lab exercises are coordinated with course content. Prerequisite: BMET 200, BHSC 202.

BMET 310 Digital Electronics 1 — A study of basic digital

techniques. Topics include switch and relay control; numbering systems; Boolean algebra; logic synthesis; codes and coding; solid state logic (TTL, CMOS, etc.); noise and loading; encoders, decoders, relay drivers and delay devices; counters, shift registers and arithmetic systems; A/D and D/A conversion, multiplexing. Prerequisite: BMET 200.

BMET 401 Biomedical Electronics 2 — Various electronic equipment used in the biomedical environment is presented through block diagrams. Selected equipment is covered in more detail with schematic diagrams (e.g. electrosurgical, telemetry and cardiac resuscitation equipment.) Electrical safety considerations of all equipment studied will be presented. Lab Exercises, coordinated with course content, emphasize calibration and repair techniques. Prerequisite: BMET 300, BMET 301, BMET 310.

BMET 402 Biomedical Electronics Project — Students will build a device such as an ECG simulator using the latest technology and design techniques. Students will gain experience regarding the actual implementation of a project such as planning, designing, material acquisition, prototyping, Printed Circuit designing, construction, testing, calibration, commissioning and evaluation. A technical report for the project is also required. Prerequisite: BMET 300, BMET 301, BMET 310.

BMET 403 Medical Imaging — Introduces the concepts involved in imaging systems used in medicine. Equipment examined includes that in X-ray, nuclear medicine, and ultrasound. Prerequisite: BMET 300, BMET 301, BHSC 202.

BMET 410 Digital Systems and Microprocessors — An introduction to microprocessor hardware and software. Topics to be covered: digital arithmetic, memories and mass storage devices, microprocessor architectures, memory and I/O decoding, I/O techniques, interrupts, DMA, LSI/VLSI peripheral chips, data communications, memory management and virtual memory, instruction sets, software development methods, subroutines, data types, operating systems, editors, assemblers, linking loaders, and introduction to a high level language as a microprocessor development tool. Prerequisite: BMET 300, BMET 310.

BMET 420 Practical Experience in Biomedical Electronics — During this period of training, students gain practical experience in biomedical electronics and related fields while working under supervision at a number of hospitals, research agencies and private companies throughout the province. The work experience portion of this course is four weeks in duration. Prerequisite: BMET 300, BMET 301, BMET 401, BMET 402, BMET 403, BMET 410.

CHEM 107 Chemistry for Biomedical Electronics — Covers basic general chemistry. The course includes stoichiometry, nomenclature, concentrations of solutions (molarity, molality, equivalent weight, PPM, percent), acid-base chemistry (strong and weak electrolytes, buffers, hydrolysis of salts) and electrochemistry (oxidation, reduction, voltaic cells, nernst equation). The laboratory part of the course which runs parallel with the lectures consists of quantitative analysis, both gravimetric and volumetric.

CHEM 207 Introduction to Organic Biochemistry for Biomedical Electronics — This course gives an introduction to organic and biochemistry. The naming, properties and main reactions of the major classes of organic compounds are discussed. The biochemistry includes both the chemistry and metabolism of fats, proteins and carbohydrates. Lab work includes techniques and synthesis in organic chemistry and biochemical techniques frequently encountered in the clinical lab, e.g.: spectrophotometry, chromatography, electrophoresis. Prerequisite: CHEM 107.

CHEM 411 Instrumental Analysis for Biomedical Electronics — Introduces basic theoretical concepts, instrument components and operation and general application of the following methods: potentiometric absorption, flame absorption and emission, fluorescence, gas and liquid chromatography and automated analysis. Prerequisite: CHEM 207.

ELEC 152 Measurement for Biomedical Electronics — Safety in electrical measurement techniques is emphasized throughout this course. Topics: error % and prediction, standards and calibration, device testing, analog and pulse signals, electrical noise, earthing, understanding service manuals. Equipment used: analog and digital meters, function and signal generators, bridges, frequency counters, curve tracers, oscilloscopes and attachments.

ELEC 252 Measurement for Biomedical Electronics — An orientation course covering basic devices for measuring pressure, temperature, density and flow. A study of the principles of analysis instruments, using potentiometric, amperometric and polarographic techniques; ultraviolet, visible and infrared spectroscopy; flame photometry; paper and column chromatography; electrophoresis and refractometric methods. Concept of regulation and feedback control.

ELEC 259 Video Fundamentals — An introductory course covering the basic principles of video display. Topics include raster scan, industrial composite video signals, character generation, video projects.

GNNU 182 Introduction to Patient Care — Introduces students to the hospital environment and the basic safety concepts of patient care. It includes observation and communication skills, body mechanics, fire safety and medical and surgical asepsis.

HCOM 104 Technical Writing for Biomedical Electronics — Emphasizes clear, correct, health-oriented technical writing for biomedical electronics technologists. Students will learn how to organize and sequence technical information, illustrate documents, describe and define technical material, write direct letters and memos, write a professional resume and application letter, and summarize reports and articles.

HCOM 203 Technical Writing for Biomedical Electronics — A continuation of HCOM 104. This term students will write and present orally hospital-oriented and industry-oriented memo reports, and write and present a longer, formal technical report. This term focuses on professional communication. Students will learn how to use the Wang word processing system to write reports and use medical terminology correctly.

HCOM 301 Advanced Communication for Biomedical Electronics — Designed to help biomedical electronics students complete the writing portion of technology assignments and projects successfully. Because the course content is, in part, determined by technology assignments, it will vary. The instructor and students work as editor and writers in the writing and revising of technology assignments. In addition, students will update resumes to graduate level requirements, as a separate part of the course.

MATH 178 Basic Technical Mathematics Biomedical Electronics — Systems of linear equations, determinants, matrices, types of systems and application to electrical networks. Polynomial curve fitting, loop analysis, and T to Y transformations. Common and natural logarithms, logarithmic/semilogarithmic graphs, decibels, and exponential growth and decay. Trigonometric functions, solution of triangles and graphing and addition of sinusoidal functions. Complex numbers, rectangular/polar transformations, phasor representation of sinusoidal waveforms and AC circuits.

MATH 278 Calculus for Biomedical Electronics — Limits, the derivative, differentiation rules, applied maxima/minima, curve sketching, and differentials with applications to electrical technology. Antidifferentiation, the indefinite integral and the definite integral including area, mean value and RMS value. Differentiation and integration of trigonometric, logarithmic and exponential functions. Fourier series. First and second order differential equations applied to electrical circuits. Basic arithmetic and functions, input/output, branching, strings, arrays and files. Arithmetic in other bases, logic gates and corresponding Boolean algebra, truth tables, Karnaugh maps, logic circuit design and binary addition/subtraction.

MATH 378 Statistics for Biomedical Electronics — Provides students with basic knowledge of statistics. Topics include random sampling, measurement and rounding, frequency distributions, measures of central tendency, measures of dispersion, normal distribution, ranks and percentiles. Estimation, central limit theorem, standard errors, confidence intervals, hypothesis testing, null and alternate hypothesis, large sample hypothesis testing, t-distribution, small sample hypothesis testing and non-parametric testing will also be covered. Computer packages will be discussed.

PHYS 324 Biophysics — This is a general level course in basic physics with emphasis on applications to biological systems. The topics covered are mechanics, heat, sound and light, with related applications. Various biological systems are studied with reference to the physical principles involved in both their development and function.

Electrophysiology Technology

Modern hospitals and health care clinics require the services of trained technologists to operate sophisticated electroneurophysiological testing equipment and other related biomedical equipment. In order to understand the operation of this equipment, the graduate will have studied mathematics, physical science and engineering subjects. Course work in the basic health sciences will inform the student about human physiology and the biological signals to be measured. In addition, course work in the social sciences will prepare the student for interpersonal relationships with the clinical environment. Extensive clinical experience is built into the program to ensure that the student develops necessary practical skills in the work environment.

Job Opportunities

Graduates of the Electrophysiology Program will find employment in hospitals or private clinics in the following fields: electroencephalography (electrical activity of the brain), electromyography (electrical activity of the neuro-muscular system), and evoked potentials (activities generated by stimulation of the sensory systems) which include electronystagmography, visual evoked response and brainstem auditory evoked response. Graduates will principally find employment in the Neurophysiology Departments of hospitals. In addition to performing a wide variety of tests on patients, the graduate will be expected to evaluate the results in order to assess the performance of the test equipment. Where necessary, tests will be repeated if an equipment/patient interface problem is identified. In addition to an ongoing evaluation of performance, the graduate will perform quality control procedures on equipment and simple calibration/maintenance functions.

The Program

The program is a combination of lab and lecture instruction at BCIT and clinical experience in the Neurophysiology Departments of local hospitals.

In both spring and fall terms, special courses in Electrophysiology and Neuroanatomy and Neurophysiology will train students in the basics of biological signal measurement and clinical apparatus. In the spring term (20 weeks) different areas of clinical experience will be covered: electroencephalography; electromyography; audiology; ophthalmology and other evoked potentials.

Upon successful completion of the two year program, the student will receive a National Diploma of Technology in Electrophysiology. After a period of work experience in a clinical situation, students will become eligible to write the National Certification Examinations of the appropriate certifying body of their chosen fields of interest.

Prerequisites

Algebra 12, Physics 11 and Chemistry 11 all with a C+ standing are the course requirements for this program. Individuals wishing to enter this field should be interested in the welfare of people, and should have an aptitude for physics, electrical and mechanical apparatus. Applicants who have special background and/or experience will also be considered on an individual basis. Most courses taken within the program require successful completion of certain prerequisites. For further information contact the Registrar's office.



Faculty and Staff

G. Eisler, M.A.Sc., P.Eng., M.B.A., Department Head
D. Moreau, B.Sc., Dipl.T.
M. Young, B.A., Dipl.T., R.E.T.

PROGRAM: Electrophysiology

Level 1		Credit
BHSC 111	Anatomy and Physiology.....	4.0
CHEM 107	Chemistry for Biomedical Electronics.....	6.0
ENPY 150	Applied Instrumentation	9.0
HCOM 104	Technical Writing for Biomedical Electronics	3.0
MATH 178	Basic Technical Mathematics for Biomedical Electronics	8.0
Level 2		
BHSC 212	Anatomy and Physiology.....	9.0
CHEM 207	Introduction to Organic and Biochemistry	7.5
ENPY 250	Electrophysiology Devices and Techniques.....	9.0
GNNU 181	Patient Care	4.5
HCOM 203	Technical Writing for Biomedical Electronics	3.0
MATH 278	Calculus for Biomedical Electronics.....	12.0
Level 3		
BHSC 312	Neuroanatomy and Physiology	5.0
BHSC 339	Human Behavior	3.0
ENPY 350	Electrophysiology	9.0
ENPY 351	Introductory Clinical Experience in Electroencephalography	8.0
MATH 378	Statistics for Biomedical Electronics	2.0
PHYS 324	Biophysics	3.0
Level 4		
ENPY 450	Clinical Experience in Electrophysiology...	45.0

Most courses taken within the program require successful completion of certain prerequisites. For further information contact the Registrar's Office.

Course Descriptions

BHSC 111 Anatomy and Physiology — A basic introductory course in human anatomy and physiology, which uses the systems approach. It provides the electrophysiology technology student with terminology and physiological concepts likely to be encountered during the first term of the program.

BHSC 212 Anatomy and Physiology — Builds on information given in BHSC 111, which is prerequisite. Emphasis is placed on that human anatomy and physiology of most interest to the electrophysiology technology student. Special attention is given to the nervous, neuromuscular and cardiovascular systems. The nervous system information forms a basis for the material presented in the third term course, BHSC 312, Neuroanatomy and Physiology.

BHSC 312 Neuroanatomy and Physiology — Provides a basic understanding of anatomy, physiology and pathophysiology of immediate relevance to the current practices of electrophysiology. Emphasis is placed on the structure and function of the nervous system and selected pathophysiological states.

BHSC 339 Human Behavior — Basic considerations of behavioral science relevant to the Electrophysiology Technologists' concerns will be explored. Theory and research findings dealing with stress and illness behavior will be presented. Professional and ethical considerations and ways of dealing with common hospital events will be explored. Emphasis will be on human relations skills in dealing with patients and staff.

CHEM 107 Chemistry for Biomedical Electronics — Covers basic general chemistry. The course includes stoichiometry, nomenclature, concentrations of solutions (molarity, molality, equivalent weight, PPM, percent), acid-base chemistry (strong and weak electrolytes, buffers, hydrolysis of salts) and electrochemistry (oxidation, reduction, voltaic cells, nernst equation). The laboratory part of the course which runs parallel with the lectures consists of quantitative analysis, both gravimetric and volumetric.

CHEM 207 Introduction to Organic and Biochemistry — This course gives an introduction to organic and biochemistry. The naming, properties and main reactions of the major classes of organic compounds are discussed. The biochemistry includes both the chemistry and metabolism of fats, proteins and carbohydrates. Lab work includes techniques and synthesis in organic chemistry and biochemical techniques frequently encountered in the clinical lab, e.g.: spectrophotometry, chromatography, electrophoresis. Prerequisite: CHEM 107.

ENPY 150 Applied Instrumentation — Provides the basic electrical/electronic knowledge and skills needed by technologist-practitioners of Prosthetics/Orthotics and EEG/Electrophysiology. Emphasis will be on dealing with problems encountered in the clinical environment.

ENPY 250 Electrophysiology Devices and Techniques — Introduces the student to devices and techniques used in clinical EEG and ECG laboratory practice. Correct placement and applications of electrodes for these two techniques is taught so that the student is qualified to act as an assistant technologist for summer employment. A comprehensive overview of the field is presented so that students can begin to select their areas of specialization.

ENPY 350 Electrophysiology — The following areas will be covered: theory and operation of EEG equipment and its use, telemetry and EEG; theory and operation of equipment related to ECG, echocardiograms, phonocardiograms and stress testing; monitoring and evaluation of implanted pacemaker perform-

ance; theory and operation of non-invasive techniques to assess patients for blood vessel disease; theory and operation of EMG equipment and its use; theory and operation of equipment related to ERG, EOG, VER, and CVA (color vision assessment); theory and operation of ENG related to equipment; related important clinical tests for the above equipment; ultrasonics. Prerequisite: BHSC 202, BMET 200, GNNU 182.

ENPY 351 Introductory Clinical Experience in Electroencephalography — Scheduled on Tuesday and Thursday mornings at the Burnaby Hospital EEG Laboratory, this course will provide hands-on patient contact experience under direct supervision, in preparation for fourth term practicum experience.

ENPY 450 Clinical Experience in Electrophysiology — An appropriate amount of time is spent in each of the following clinical areas: EEG; EMG; cardiovascular laboratory; audiology; ophthalmology. Program will be tailored to the specific student. Clinical work may be out-of-town. Prerequisite: ENPY 350, ENPY 300, ENPY 301, ENPY 310.

GNNU 182 Patient Care — Introduces students to the hospital environment and the basic safety concepts of patient care. It includes observation and communication skills, body mechanics, fire safety and medical and surgical asepsis.

HCOM 104 Technical Writing for Biomedical Electronics — Emphasizes clear, correct, health-oriented technical writing for biomedical electronics technologists. Students will learn how to organize and sequence technical information, illustrate documents, describe and define technical material, write direct letters and memos, write a professional resume and application letter, and summarize reports and articles.

HCOM 203 Technical Writing for Biomedical Electronics — A continuation of HCOM 104. This term students will write and present orally hospital-oriented and industry-oriented memo reports, and write and present a longer, formal technical report. This term focuses on professional communication. Students will learn how to use the Wang word processing system to write reports and use medical terminology correctly.

MATH 178 Basic Technical Mathematics for Biomedical Electronics — Systems of linear equations, determinants, matrices, types of systems and application to electrical networks. Polynomial curve fitting, loop analysis, and T to Y transformations. Common and natural logarithms, logarithmic/semilogarithmic graphs, decibels, and exponential growth and decay. Trigonometric functions, solution of triangles and graphing and addition of sinusoidal functions. Complex numbers, rectangular/polar transformations, phasor representation of sinusoidal waveforms and AC circuits.

MATH 278 Calculus for Biomedical Electronics — Limits, the derivative, differentiation rules, applied maxima/minima, curve sketching, and differentials with applications to electrical technology. Antidifferentiation, the indefinite integral and the definite integral including area, mean value and RMS value. Differentiation and integration of trigonometric, logarithmic and exponential functions. Fourier series. First and second order differential equations applied to electrical circuits. Basic arithmetic and functions, input/output, branching, strings, arrays and files. Arithmetic in other bases, logic gates and corresponding Boolean algebra, truth tables, Karnaugh maps, logic circuit design and binary addition/subtraction.

MATH 378 Statistics for Biomedical Electronics — Provides students with basic knowledge of statistics. Topics include random sampling, measurement and rounding, frequency distributions, measures of central tendency, measures of dispersion, normal distribution, ranks and percentiles. Estimation, central

limit theorem, standard errors, confidence intervals, hypothesis testing, null and alternate hypothesis, large sample hypothesis testing, t-distribution, small sample hypothesis testing and non-parametric testing will also be covered. Computer packages will be discussed.

PHYS 324 Biophysics — This is a general level course in basic physics with emphasis on applications to biological systems. The topics covered are mechanics, heat, sound and light, with related applications. Various biological systems are studied with reference to the physical principles involved in both their development and function.

Health Information Technology

Department of Health Engineering Services

Health Information Technology offers interested students the advantage of two program options — a one year health record technician option and a two year health record administrator option. The two options have essentially an equivalent first year curriculum and are designed to meet the requirements of prospective employers. Both options are open to female and male candidates. Applicants are required to discuss the nature of the work with health record administrators or technicians currently working in the field.

Health record professionals make a valuable contribution to the health care system. They provide a very special service to the administrative and treatment teams in a health facility, a service that provides the information necessary to manage the facility to its best advantage while giving patients the best possible care. The major source of health information is the health or medical record which summarizes the information about the patient's care.

Health records are maintained in all health care facilities, and provide a permanent, confidential report of each patient's encounter with the health care delivery system. The health record is a complete, timely, accurate document of medical and allied health professional observations concerning health, illness or injury and is an important tool in evaluating the quality of care. As the necessity for accurate documentation in health care grows, computerization is becoming an increasingly important consideration in the recording and utilizing of health information, including the linking of records.

The Health Information Technology program is fully accredited by the Canadian College of Health Record Administrators (CCHRA). Successful completion of the national examination qualifies the graduate to work anywhere in Canada.

Health Record Administrator Option

This is a **two year** program designed to train students for management and administration in the health record department of hospitals and health agencies. Each graduate receives a Diploma of Technology from BCIT and is eligible for recognition by the Canadian College of Health Record Administrators at the Certificant Level (CCHRA[C]).

Health record departments of hospitals and health agencies require the specialized services of health record administrators to develop, manage and utilize health information systems.

Job Opportunities

The health record administrator may be employed in the hospital health record department, as the director of the department or in a staff position. In addition to traditional employment in hospitals, other facilities such as community health centres, government agencies and industry may also employ health record administrators to develop, implement and maintain health information systems.

Health record administration is an expanding field. With initiative, today's health record administrator may enter any area in which knowledge of health record standards and systems is necessary. As the use of computers grows, health record admin-



istrators may expect the design, analysis and use of computerized information systems to become an increasingly important part of their work.

The Program

In collaboration with the Health Record Association of British Columbia and health care agencies, BCIT has designed the Health Record Administrator option to provide two years of instruction in the form of lectures, lab exercises and practical experience. In the first year, students concentrate on the basic health sciences and acquire a fundamental knowledge of health record science. Two weeks of introductory practical experience in hospital health record departments will be provided during term two. In the second year, health record administration, management, labor relations, organizational theory, quality assurance and computer applications will be stressed. During the last term of the program, a ten week practicum in health record departments of B.C. hospitals and various health agencies will take place. Students incur the costs of travel and living expenses during practicum sessions.

Students are expected to become members of the HRABC while attending the program. To be recognized by the CCHRA, graduates will successfully write the national examination thus becoming Certificant members of the CCHRA.

Graduates possess the skills required to meet current and future demands for health record professionals trained in information and resource management applicable to the health care industry.

Prerequisites

Algebra 12, Biology 12, and proficiency in typing (approximately 50 wpm) are course requirements for this program. Maturity, responsibility and an interest in health care and information management are essential. Experience in business or in a related health field is an asset. The work involved demands attention to detail and accuracy; of utmost importance are leadership ability, initiative and effective interpersonal skills.

Applicants are required to have a successful personal interview with HIT faculty following a visit to a health record department in an acute care general hospital.

Faculty and Staff

George Eisler, PEng., M.A.Sc., M.B.A., Department Head
 Elaine Gibson, CCRHA(C), Program Head
 Laurie Montgomery, BHRS, CCHRA(C)
 Betty Nelson, CCHRA(C)

PROGRAM: Health Record Administrator

Level 1	Credit
BHSC 103 Anatomy and Physiology.....	4.0
HCOM 105 Communications	3.0
HITA 100 Health Record Science	3.0
HITA 101 Medical Terminology	3.0
HITA 102 Disease Processes	5.0
HITA 105 Health Record Procedures	4.0
MATH 180 Statistics.....	4.0
MLAB 112 Clinical Lab Procedures.....	4.0
Level 2	
BHSC 203 Anatomy and Physiology.....	4.5
COMP 111 Intro to Data Processing.....	4.0
HCOM 204 Communications	4.5
HITA 103 Transcription.....	3.0
HITA 200 Health Record Science	5.0
HITA 202 Disease Processes	5.0
HITA 206 Coding and Data Retrieval.....	7.5
HITA 210 Intro to Quality Assurance	4.0
MATH 280 Statistics.....	4.5
HITA 205 Health Record Practicum (February/ March)	3.0
Level 3	
BHSC 337 Organizational Psychology	4.0
COMP 211 Computer Applications	3.0
HITA 300 Health Record Administration.....	5.0
HITA 303 Health Record Technological Developments.....	3.0
HITA 306 Coding and Data Retrieval.....	7.0
HITA 310 Quality Assurance and Risk Management	4.0
OPMT 169 Health Records Management.....	4.0
Level 4*	
BHSC 437 Organizational Psychology	3.0
COMP 311 Computer Applications	3.0
HITA 400 Health Record Administration.....	4.5
HITA 406 Coding and Data Retrieval.....	5.0
HITA 410 Quality Assurance for HRDs	3.5
HITA 430 Health Labor Relations	3.0
OPMT 269 Health Records Management.....	
HITA 405 Health Information Practicum (March/ April/May)	20.0

*Courses run from January to spring break in March to be followed by 35 hours/week, 10 week practicum from mid-March to end of May.

Health Record Technician Option

The health record technician is a highly-skilled member of the health care team. Through the Health Information Technology, BCIT has designed a one-year program of study for individuals interested in pursuing this career option.

This program is designed to train students in the technical aspects of health record science. Each graduate receives a Certificate of Technology from BCIT and is eligible for recognition by the Canadian College of Health Record Administrators at the Associate level (CCHRA[A]).

Job Opportunities

The program is designed to prepare graduates for small hospitals where they may assume major responsibilities in the health record department, and for larger hospitals where they work under the supervision of a health record administrator. Other hospital departments and health facilities (such as the Cancer Control Agency of B.C. or Greater Vancouver Mental Health Services) provide additional employment opportunities.

In a small health care facility, the health record technician may be fully responsible for the operation of the health record department; i.e. the initiation, development, operation and maintenance of health information systems. In a larger institution, the health record technician may specialize in one particular area of work. This includes technically evaluating health records according to established standards; compiling various health and administrative statistics; coding and abstracting data from health records; maintaining and using a variety of indices, storage and data retrieval systems.

The Program

Lectures, lab exercises and practical experience are combined in the training of health record technicians. Basic health sciences and the fundamentals of health record science are taught in depth. Two weeks of introductory practical experience in hospital health record departments will be provided during term two. Also during term two, the student will be introduced to quality assurance, data processing, and department management and supervision. The program concludes with a more advanced five week practicum during which technical experience is provided by health record departments in hospitals. Students incur costs of travel and living expenses for practicum sessions.

Students are expected to become members of the HRABC while attending BCIT. To be recognized by the CCHRA, graduates will successfully complete the national examination, thus becoming Associate members of the CCHRA.

Graduates who wish to become health record administrators may do so in a number of ways, such as completing certain specified BCIT continuing education courses or, with suitable prerequisites, returning to BCIT for the second year of the Health Record Administrator Option on a full-time or part-time basis.

Prerequisites

Graduation from the Selected or Combined Studies Program plus Algebra 12, Biology 12 and proficiency in typing (approximately 50 wpm). Maturity, responsibility and an interest in health care and information handling are essential for a successful career in the health information field. The work involved demands attention to detail, accuracy and reliability.

Applicants are required to have a successful personal interview with HIT faculty following a visit to a health record department in an acute care general hospital.

PROGRAM: Health Record Technician

Level 1	Credit
BHSC 103 Anatomy and Physiology.....	4.0
HCOM 105 Communications	3.0
HITA 100 Health Record Science	3.0
HITA 101 Medical Terminology	3.0
HITA 102 Disease Processes	5.0
HITA 105 Health Record Procedures	4.0
MATH 180 Statistics.....	4.0
MLAB 112 Clinical Lab Procedures	4.0

Level 2		Credit
BHSC 203	Anatomy and Physiology.....	4.5
COMP 111	Intro to Data Processing.....	4.0
HCOM 204	Communications	4.5
HITA 200	Health Record Science	5.0
HITA 202	Disease Processes	5.0
HITA 210	Intro to Quality Assurance	4.0
HITT 204	Transcription.....	5.0
HITT 206	Coding and Data Retrieval.....	9.5
HITT 205	Health Record Practicum (February/ March)	3.0
HITT 305	Health Record Practicum (June/July).....	10.0

Course Descriptions

BHSC 103 Human Anatomy and Physiology — Provides students with an understanding of normal body structure and function. The course relates this knowledge to various aspects of the work performed by health record technicians and administrators such as coding and abstracting, data collection for evaluation of patient care, and specification of documentation requirements in the health record.

BHSC 203 Human Anatomy and Physiology — See BHSC 103. Prerequisite: BHSC 103.

BHSC 337 Organizational Psychology — Prepares students to work in health records departments in health care institutions at a supervisory level. Organizational behavior theory and research findings will be presented and applied to situations encountered in health care organizations. Role playing and other involvement exercises will be used to apply the theory. Students will be encouraged to present their work-related experiences to discuss the course content.

BHSC 437 Organizational Psychology — See BHSC 337. Prerequisite: BHSC 337.

COMP 111 Introduction to Data Processing — Lectures and practical exercises are used to present topics such as: computer operations; input, output and storage devices; input and reporting methods; report design; data accuracy and error correcting; file processing; systems design concepts; flowcharting; and programming using the BASIC language.

COMP 211 Computer Applications — Covers computer applications in engineering and medical technologies; how a computer works, recognizing problems suitable for computer solution, flowcharting and communicating with computer personnel. Emphasis is on the use of computers to solve problems related to the technology concerned. Where available, 'package' programs will be demonstrated and used by students. FORTRAN or BASIC programming language is taught depending on the technology.

COMP 311 Computer Applications 2 — The objectives and components of health information systems are examined from various perspectives: types of systems, reasons for computerizing health information and the role of the health record administrator in the needs assessment, analysis, design and management of health information systems. The evaluation and selection of hardware and software are also discussed. Prerequisite: COMP 211.

HCOM 105 Communication for Health Information Technologists — Introduces health information students to professional communication. The course emphasizes clear, concise and correct health-oriented writing. Students will learn how to select, organize and sequence information, how to write instructions and procedures, how to write direct memos and letters, and how

to present information orally. They will also learn how to use the Wang word processing system to plan, write and revise documents.

HCOM 204 Communication for Health Information Technologists — A continuation of HCOM 105. This term, students will learn how to write persuasively, prepare an effective resume and application letter, write effective information and analytical reports, conduct effective meetings, plan and implement an effective inservice education program and how to access and report on information in the professional literature.

HITA 100 Health Record Science — This course provides students with knowledge and practice in the fundamental principles and procedures of health record science. After an orientation to the program and the profession, areas studied in the first term include a detailed examination of all aspects of the health record from formation to completion; microfilming, record retention; hospital accreditation; interdisciplinary relations and intrahospital organization, confidentiality and release of health information. The second term incorporates a more detailed analysis of the profession, legal aspects of health records, the Canadian health care delivery system, managing a small medical library, and an introduction to management and supervision of a health record department.

HITA 101 Medical Terminology — An introduction to the language of medicine. Basic rules of medical terminology, medical abbreviations, medical specialties and operative terms are included. There will be a detailed study of medical prefixes, roots and suffixes, with emphasis on analysis and word-building.

HITA 102 Disease Processes — An introduction to the concepts of pathophysiology. Common diseases for each body system are studied in detail relating each to medical and surgical treatments. Diseases studied will be correlated with patient records in laboratory assignments. Corequisite: HITA 101.

HITA 103 Transcription — Transcription practice with medical, obstetrical, pathological and surgical reports. The course includes an introduction to the electronic typewriter with limited memory capacity, as well as an introduction to word processing. The emphasis is on accuracy of transcription and increasing competence with electronic equipment. Prerequisite: HITA 101, 102, and 105.

HITA 105 Health Record Procedures — Provides practical experience in the basic clerical and technical tasks performed in a health record department. The course also gives students an introduction to coding principles which enables them to assign complete, accurate ICD-9-CM codes to diagnostic and operative statements. The course coordinates with HITA 100 Health Record Science, and is conducted in a simulated health record department on campus.

HITA 200 Health Record Science — See HITA 100. Prerequisite: HITA 100.

HITA 202 Disease Processes — See HITA 102. Prerequisite: HITA 102.

HITA 205 Health Record Practicum — A two week practicum focusing on basic clerical and technical tasks in the health record departments of B.C. hospitals. Prerequisite: HITA 100 and 105. Corequisite: HITA 206 or HITT 206.

HITA 206 Coding and Data Retrieval — Emphasizes the coding of diagnoses and procedures from medical records, case studies, etc., using ICD-9-CM and ICD-9; abstract data manually using HMRI. Both activities are to be performed with speed and a high degree of accuracy. The student will also be able to locate

and retrieve specified information from the HMRI printouts. Prerequisite: BHSC 103, HITA 101, 102, 105, MLAB 112.

HITA 210 Introduction to Quality Assurance— Deals with data collection, analysis and presentation. Topics include classification systems, data quality control, statistical formulae for health information, and an introduction to quality assurance. Prerequisite: HITA 100 and HITA 105.

HITA 300 Health Record Administration — Emphasizes the problem-solving approach to certain aspects of health record administration. Areas of advanced study include specialized hospitals (patient records, statistics and accreditation), the problem oriented record, medicolegal and ethical aspects, the health care delivery system and the health record profession. Health record policies, procedures and forms design; administrative committees; office space and environmental planning; administration of the Admitting and Outpatient Departments are also studied. Prerequisite: HITA 200.

HITA 303 Health Record Technological Developments — Examines the technological advances found in health record departments today. Some of the "office of the future" areas discussed are computerized coding and abstracting, computerized CR/ADT, electronic mail and advances in word processing. Emphasis is on implementation and evaluation of these systems. Prerequisite: HITA 103 or HITT 204.

HITA 306 Coding and Data Retrieval — A continuation of HITA 206, it provides the student with weekly labs in coding, abstracting (manually and electronically) with emphasis on speed and accuracy. The student will also be able to summarize and present data in such a way as to create and stimulate interest in its use. Prerequisite: HITA 206.

HITA 310 Quality Assurance and Risk Management — Emphasizes the management and use of health information. After a review of HITA 210 (particularly quality assurance and coding principles), the student will learn about the role of the Health Record Department (HRD) in a risk management program. Data collection and presentation will be studied and the student will be able to produce timely, effective, useful reports. Quality assurance programs will be studied in terms of development, implementation and use of the health record department. Students will practice data retrieval and reporting using criteria audit methodology. Prerequisite: HITA 210.

HITA 400 Health Record Administration — See HITA 300. Prerequisite: HITA 300.

HITA 405 Health Information Practicum — Practical experience in the health record departments of general and specialized hospitals and other health facilities is provided, under the supervision of the director of health record services and a faculty member. After orientation to the clerical and technical duties, emphasis is placed on providing practice and instruction in the duties commonly performed by a health record administrator. Prerequisite: Successful completion of all courses in the practicum.

HITA 406 Coding and Data Retrieval — See HITA 306. Prerequisite: HITA 306.

HITA 410 Quality Assurance for HRD's — The development, implementation and maintenance of a quality assurance program for the health record department will be studied in depth. The course also examines the principles and practices of research and epidemiology. Prerequisite: HITA 310.

HITA 430 Health Labor Relations — A discussion of the development of labor relations in the health care environment, with

detailed study of the basic principles of union practices, the application of collective agreements, the grievance procedure, and the collective bargaining process. Prerequisite: HITA 300.

HITT 204 Transcription — Includes details as outlined in HITA 103 with increased emphasis on productivity and experience on word processing equipment. A major project concerned with the concepts, applications and evaluation of word processing services in the health record department is included. Prerequisite: HITA 101, 102, and 105.

HITT 205 Health Record Practicum see HITA 205. Prerequisite: HITA 100 and 105.

HITT 206 Coding and Data Retrieval — See HITA 206.

HITT 305 Health Record Practicum — An advanced, five-week practicum for health record technician students. The course provides concentrated, practical experience in coding and abstracting in the health record departments of provincial hospitals. Students spend two weeks at the same site as the HITT 205 practicum and three weeks at a different site. Prerequisite: Successful completion of all courses in the program.

MATH 180 Basic Mathematics and Statistics for Health Information — Rates ratios, proportions, and percentages. Death rates, and measures of fertility and morbidity. Cartesian coordinate system, the straight line and its graph, and the least squares line. Exponential/logarithmic theory, common and natural logarithms and logarithmic/semilogarithmic graphs. Frequency distributions and their graphical presentation. Measures of central tendency and variation, percentiles, quartiles and skewness.

MATH 280 Statistics 2 for Health Information — Probability theory and laws. Random variables, mathematical expectation, discrete and continuous theoretical distributions. Sampling, estimation and hypothesis testing with both large and small samples. Method of least squares, regression and correlation. Non-parametric statistics. Prerequisite: MATH 180.

MLAB 112 Introduction to Clinical Laboratory Procedures — An introduction to clinical lab procedures in the fields of clinical chemistry, urinalysis, hematology, histotechnology and immunohematology for the purpose of interpreting lab reports in reference to documentation on the health record, abstracting, and quality assurance studies. Course also includes microbiology.

OPMT 169 Health Records Management — Management principles are related to the health care industry in such areas as health care financing, a systems approach to health care, organizational structure, planning, organizing, directing and controlling. Quantitative approaches to the management function are stressed.

OPMT 269 Health Records Management — A continuation of the scientific principles of management as applied to work improvement and innovation in health care including problem solving, data collection and analysis, methods of work measurement and work sampling techniques, and implementation strategies. Prerequisite: OPMT 169.

Prosthetics and Orthotics Technology

Department of Health Engineering Services

Prosthetists and orthotists help people who have become disabled or who were born with physical defects by fitting them with artificial limbs or supports. The prosthetist designs, constructs and fits artificial limbs, while the orthotist designs, constructs and fits orthopaedic braces and supports. Both work closely with doctors, physiotherapists and others in rehabilitation medicine. After assessing the needs of a patient, the prosthetist or orthotist may assemble the components of an artificial limb or support, or may develop specifications for its construction by a technician. The device is then fitted and adjusted to the patient. From time to time, repairs and maintenance work must also be done.

Job Opportunities

Prosthetists and orthotists work in rehabilitation hospitals and ambulatory care services, in special treatment facilities such as arthritis centres, and in private practice. Starting salaries are about \$18,000 per year, rising to about \$25,000 after certification.

The Program

The two year course of studies combines lectures, labs and practical experience in local health agencies. The curriculum equips graduates to recognize patient problems, assess individual needs, design and construct appliances, select appropriate materials and deal with the emotional difficulties of patients.

The Prosthetics and Orthotics Program is jointly funded by three western Canadian provinces: B.C., Alberta and Saskatchewan. Applications are accepted every second year on a pro-rated basis from each of the three provinces.

The next intake of students is set for September, 1988.

Post-graduation

After three year's work experience under the guidance of a certified orthotist or prosthetist, graduates may write the national certification examination of the Canadian Board of Certification for Prosthetists and Orthotists.

Prerequisites

Algebra 12 and Physics 11 are course requirements for this program. Metalwork and woodwork courses are recommended. Applicants should have a good academic background, manual dexterity, mechanical aptitude and good interpersonal skills. Patience and inventiveness are of considerable importance.

Expenses

In addition to tuition fees, students need approximately \$600 for textbooks and supplies for the two year program. Students are also responsible for costs of travel to and from agencies where practicums are held, and should be prepared to purchase certain small hand tools.

Faculty and Staff

G. Eisler, M.A.Sc., P.Eng., B.B.A., Department Head
Gayle Klammer
Wm. J. McGuinness, M.A., C.P.O., Program Head



PROGRAM: Prosthetics and Orthotics

Level 1		Credit
BHSC 110	Anatomy and Physiology Systems	4.0
HCOM 111	Technical Writing for Prosthetics and Orthotics.....	3.0
MATH 184	Basic Technical Mathematics for Prosthetics and Orthotics	4.0
P/OT 100	Prosthetics and Orthotics 1.....	15.0
PHYS 121	Physics for Prosthetics and Orthotics	4.0
Level 2		
BHSC 210	Anatomy and Physiology Systems	4.0
BHSC 211	Regional Anatomy 1.....	3.0
BHSC 242	Behavioral Science	4.0
CHSC 284	Materials Workshop	3.0
HCOM 206	Technical Writing for Prosthetics and Orthotics.....	4.5
MATH 284	Basic Technical Mathematics for Prosthetics and Orthotics	3.0
P/OT 200	Prosthetics and Orthotics 2.....	14.5
P/OT 202	Practicum	6.0
P/OT 220	Biomechanics	3.0
Level 3		
BHSC 310	Pathology and Pathophysiology	2.5
BHSC 311	Anatomy and Physiology Regional	2.5
BMET 384	Applied Electrical Fundamentals.....	2.5
GNNU 183	Patient Care	1.0
P/OT 300	Prosthetics and Orthotics 3.....	19.0
P/OT 320	Biomechanics	2.5
Level 4		
BHSC 410	Applied Pathology.....	2.5
P/OT 400	Prosthetics and Orthotics 4.....	25.5
P/OT 401	Business Practices	3.5
P/OT 402	Practicum	10.0
P/OT 410	Patient Assessment and Care	3.5

Course Descriptions

BHSC 110 Anatomy and Physiology Systems — This course, together with BHSC 210, follows a systems approach to the study of the structure and function of the human body. The course deals with the physiology of the musculo-skeletal and nervous systems. Also included are the basic cytological and embryological principles relevant to these systems.

BHSC 210 Anatomy and Physiology Systems — A continuation of BHSC 110. Of primary concern is the study of the organization and function of the nervous system with particular reference to motor control and the basic anatomy and physiology of the circulatory, respiratory, digestive, urinary, endocrine and reproductive systems. Prerequisite: BHSC 110.

BHSC 211 Regional Anatomy 1 — This is a laboratory course which together with BHSC 311 follows a regional approach to the study of human anatomy. The major emphasis in this course is on the study of the muscles and skeletal structure of the lower limb. Prerequisite: BHSC 110.

BHSC 242 Behavioral Science — In a series of lectures, discussions and planned experiences, students are given a greater understanding of how various people react to physical loss or illness, and of the role to be played in assisting the handicapped to reintegrate into society. Topics include the psychology of being ill, understanding stress behavior, pain management, interpersonal communication, adjustment in self-image, the disabled person in society and relationships among health care professionals.

BHSC 310 Pathology and Pathophysiology — Students explore basic concepts of the disease process, and the nature of the various disorders they are most likely to see in their prosthetic/orthotic practices. Topics such as cellular injury and death, trauma, inflammation and healing are covered. Specific disorders include bone, joint and muscle pathologies, neurological and hemodynamic disorders, metabolic and congenital abnormalities and neoplasia.

BHSC 311 Anatomy and Physiology Regional — This course is a continuation of BHSC 211 and follows a regional approach to the study of human anatomy. Emphasis is placed on the muscles and skeletal structures of the upper limb and trunk.

BHSC 410 Applied Pathology — Specific diseases frequently encountered by the Orthotist or Prosthetist are investigated in detail. Prerequisite: BHSC 310.

BMET 384 Applied Electrical Fundamentals — Students become familiar with AC and DC circuits as well as other electrical building blocks. This theory will be used to explain the operation of electrically powered prosthesis.

CHSC 284 Materials Workshop — Provides a basic coverage of the structures, properties and applications of common engineering materials with emphasis on those used in prosthetic and orthotic devices. Concepts such as tensile and yield strength, fatigue, hardness and deformation will be explored both in theory and in the testing laboratory. The aim is to provide an appreciation of the materials which are or may be used in prosthetic/orthotic devices, and to explain at least some of the factors involved in selecting a material for a specific purpose.

GNNU 183 Patient Care — Students are instructed in the basic safety and comfort needs of patients requiring their services. The course treats such topics as proper procedures for lifting or transferring patients, medical and surgical asepsis, and appropriate interventions in emergency situations.

HCOM 111 Technical Writing for Prosthetics and Orthotics — Through a series of lectures and projects, students improve their ability to express themselves clearly and appropriately to patients and their families, health care professional groups such as government and fee-paying agencies. Topics include basic skills in writing instructions, memorandums, letters and reports and effective public speaking. Library orientation and research techniques are also emphasized.

HCOM 206 Technical Writing for Prosthetics and Orthotics — A continuation of HCOM 111. Students write routine and persuasive reports and proposals. An oral presentation is also included. The emphasis is on communication applications in the prosthetics and orthotics field.

MATH 184 Basic Mathematics for Prosthetics and Orthotics — Functions and their graphs. Systems of linear equations, determinants and matrices. Trigonometric functions of any angle, solution of triangles, radian measure and graphs of trigonometric functions. Complex numbers and their graphical representation and application.

MATH 284 Basic Technical Mathematics for Prosthetics and Orthotics — Exponential/logarithmic theory, common and natural logarithms, logarithmic/semilogarithmic graphs, exponential growth and decay. Organization and graphical presentation of data, frequency tables, histograms, ogives, measures of central tendency and variation. Statistical inference.

P/OT 100 Prosthetics and Orthotics 1 — Initially, students are oriented to the terminology, general concepts and devices commonly prescribed in the field. The area of Lower Limb Orthotics is then treated in detail, with the aim of developing competence in the materials, components and tools commonly used in the construction of lower limb orthoses.

P/OT 200 Prosthetics and Orthotics 2 — The area of Lower Limb Prosthetics is examined in detail. Design principles underlying the patellar-tendon-bearing prosthesis, its variants are analyzed. Students design, construct, fit and align a variety of prostheses for trans-tibial and Syme's amputees. While casting techniques, fitting procedures and alignment principles are emphasized, attention is also given to proper use of materials, acceptable workmanship and cosmetic finishing. Prerequisite: P/OT 100.

P/OT 202 — Practicum — Students are given the opportunity to apply their knowledge of design principles and fitting procedures to a variety of patients under the supervision of a practicing prosthetic or orthotic clinician. Participation in clinical activity and discussion of unusual fitting problems are encouraged. Specific projects aimed at amplifying work done in the Prosthetic and Orthotic courses are required. Prerequisite: P/OT 200, P/OT 220, BHSC 210, BHSC 211.

P/OT 220 Biomechanics — Normal human locomotion is studied in some detail. Force tolerance and mobility of the skeletal system are examined in detail to determine the functional loss associated with various physical disorders or amputations, and the residual function upon which a lower limb prosthesis or orthosis can be based. Prerequisite: PHYS 121.

P/OT 300 Prosthetics and Orthotics 3 — Lower Limb Prosthetics is completed with the treatment of Trans-Femoral and Total Leg Prostheses. Prerequisite: P/OT 202.

P/OT 320 Biomechanics — Force tolerance and mobility of the skeletal system are examined in detail to determine the functional loss associated with various physical disorders or amputations and the residual function upon which a prosthesis or

orthosis can be based. The effect of pressure on soft tissue is also explored. Various spines and upper limb devices are analyzed from the viewpoint of the mechanical forces at work and their effect on the disabled person. Prerequisite: P/OT 202.

P/OT 400 Prosthetics and Orthotics 4 — The area of Spinal Orthotics is covered from the principles involved in fitting a corset to the construction of CTLSO, Milwaukee type. Biomechanical principles and fitting guidelines will be emphasized more than construction techniques. The area of Upper Limb Prosthetics and Orthotics is then treated with each student constructing and fitting a variety of devices, including Myoelectric Prostheses. Prerequisite: P/OT 302.

P/OT 401 Business Practices — Students receive a basic understanding of the planning, organization, directing and controlling functions of business management. Topics such as human relations, management of time, budgeting and accounting, record keeping and labor relations will be covered, with examples drawn from actual prosthetic/orthotic facilities. The ethical and legal concerns of a health care professional will also be presented.

P/OT 402 Practicum — See P/OT 202. Prerequisite: P/OT 400, P/OT 401, P/CT 410.

P/OT 410 Patient Assessment and Care — A series of presentations and projects help students learn how to evaluate patients from the viewpoint of functional loss, select appropriate devices to restore function, and design solutions to specific needs not met by available componentry. Basic principles and procedures for handling the disabled are also covered.

PHYS 121 Physics for Prosthetics and Orthotics Technology — This general level physics course emphasises physics applications in prosthetics and orthotics. The course covers mechanics, and includes topics in kinematics, dynamics, statics, simple machines, energy and fluid mechanics. Measurement and problem solving techniques are stressed. The mathematical treatments require algebra and trigonometry.

Medical Laboratory Technology

The Medical Laboratory Technologist

The medical laboratory technologist, as a member of the Health Care Team, performs the many, varied and complex laboratory testing procedures on blood samples, tissue specimens and body fluids which are used by physicians as important aids in the diagnosis and treatment of a wide range of medical disorders and conditions. Rapid and continuous advancement in the techniques, procedures and instrumentation involved in the practice of medical laboratory technology make it an ever expanding and challenging field for the technologist.

Employment Opportunities

Medical laboratory technology offers a variety of scientific pursuits within the modern hospital, the private clinic and the research laboratory. These pursuits include Clinical Chemistry, Clinical Microbiology, Hematology, Histotechnology and Immunohematology. The trained Medical Laboratory Technologist may pursue a career in any one or a combination of these fields after training.

The Program

The training program at BCIT is a two year Diploma program consisting of one year of academic studies at the Institute followed by a twelve month clinical training period spent in one of the clinical facilities (hospital or private lab) associated with the program. All participating laboratories are accredited for training purposes conjointly by the Canadian Medical Association and the Canadian Society of Laboratory Technologists. After successful completion of the two year training program, the student is eligible to write the Certification Examinations of the Canadian Society of Laboratory Technologists, which lead to the qualification of Registered Technologist, the nationally-recognized qualification for employment in a Medical Laboratory.

Affiliate Clinical Training Facilities

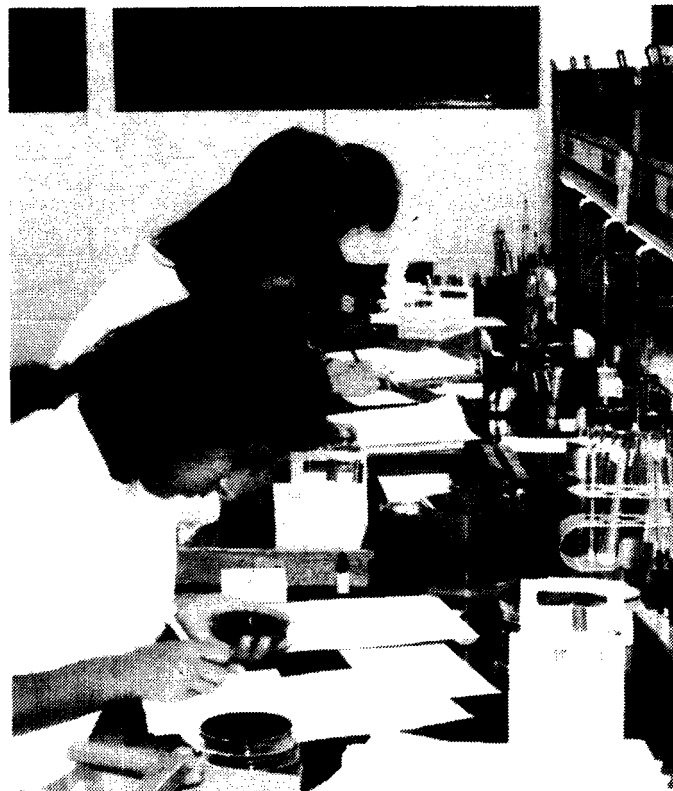
There are ten clinical training laboratories affiliated with the MLT program. Six of the laboratories are located in the Lower Mainland (Vancouver and surrounding area), three are on Vancouver Island and one is in the Interior of B.C.

Prerequisites

The following First Year University-level courses (or their equivalent in a Community College) are the prerequisites for entry into the Medical Laboratory Technology program:

Biology	UBC 101 or 102
Chemistry	UBC 110 or 120
Physics	UBC 110 or 120
English	UBC 100
Mathematics	UBC 3 credits at the Math 100 level*

*No specific Mathematics courses are recommended. However a total of 3 UBC credits at the Math 100 level (or its equivalent) are required. Calculus or statistics courses are acceptable. Applicants should be aware that, in the event that their application to the Medical Laboratory Technology is not successful, Calculus courses are required for entry into most second year university science programs.



A complete First Year Science Program, 15 credits at UBC (or its equivalent in a Community College), is required for entry into the program. Applicants who do not have the appropriate courses and credits (or their equivalents) will not be considered eligible.

Color blindness precludes admission to the MLT program.

Final acceptance to the program will be based on the results of a personal interview with senior staff members of one of the affiliated clinical laboratories.

Starting Date and Length of the MLT Program

The Medical Laboratory Technology program will start on **August 4th, 1987**. Note that this is an earlier start than most of the other programs at BCIT. The academic year will finish at the end of May. The Clinical training year will begin in June 1988 and continue for fifty-two weeks.

Faculty and Staff

Jannie Scriabin, B.Sc. (Hons.), M.Sc., A.R.T. (Clin.Chem.),
Department Head

Faculty:

Wendy W. Basford, R.T.
Paul Bradbury, F.I.M.L.S., A.R.T. (Hist.), Senior Instructor
Frank L. Curtis, F.I.M.L.S., A.R.T. (Immunohaem.)
Lavena J. Marshall, A.R.T. (Clin.Micro.)
Karen E. Nicolson, B.Sc., A.R.T. (Clin.Micro.)
Lloyd Simandl, A.R.T. (Hematol.)
Evelyn A. Whiteside, B.A., R.T., Senior Instructor
Dorothy Yarema, B.Sc., R.T.

Technical Staff:

Elinor Hudon, R.T.
K. Patricia MacCulloch, R.T.
Heather A. Pedlar, R.T.
Milena Petrovic
Linda Preston
G. Marcia Sealy, R.T.

Course of Studies

Level 1 — (20 weeks including exam week)

		Clrm hrs/wk	Credit
BHSC 104	Human Anatomy/Physiology	6.0*	3.0
BHSC 121	Introductory Principles of Immunology	6.4*	3.5
MLAB 101	MLT Fundamentals 1	6.3*	3.5
MLAB 102	MLT Fundamentals 2	9.5*	6.5
MLAB 103	Clinical Chemistry	9.0	8.5
MLAB 104	Clinical Microbiology	9.0	8.0
MLAB 105	Hematology	7.0	6.0
MLAB 106	Histotechnology	5.0*	2.5
MLAB 107	Immunohematology	5.0	4.5
			46.0

Level 2 — (21 weeks including exam week, excluding Spring Break)

MLAB 203	Clinical Chemistry	8.5	12.0
MLAB 204	Clinical Microbiology	9.0	12.5
MLAB 205	Hematology	6.5	9.0
MLAB 206	Histotechnology	4.5	6.5
MLAB 207	Immunohematology	4.0	6.0
MLAB 210	MLT Correlation	*3.0	1.0
			47.0

* Course is less than 10 weeks in length.

Year 2

Clinical training in an affiliated clinical facility in the Vancouver area (Lower Mainland), Vancouver Island or the Interior of B.C.

Course Descriptions

BHSC 104 Human Anatomy/Physiology — A systematic approach to the study of human anatomy and physiology for Medical Laboratory Technology students. The course includes basic cytology and an introduction to the skeletal, muscular, nervous, circulatory, respiratory, digestive, urinary and reproductive systems.

BHSC 212 Introductory Principles of Immunology — A basic course designed to give the Medical Laboratory Technology student encountering immunology for the first time, a general background in this broad field of study. The course deals with body defenses against disease; types of immunity and their physiological characteristics; biologicals used; nature and function of antigens and antibodies; the basic principles and mechanics of in vitro immunologic diagnostic tests; hypersensitivities, their characteristics and management; immune deficiency diseases and auto-immunity.

MLAB 101 MLT Fundamentals 1 — An introductory course for the Medical Laboratory Technology student with emphasis on general techniques, equipment (various types of microscopes, balances, centrifuges, electrophoretic and chromatographic separation equipment, water purifying equipment, automatic pipettes and dilutors; instrumentation (potentiometry, spectrophotometry); laboratory safety, specimen handling, disinfection and sterilization; laboratory math, reagent preparation and other basic knowledge that applies to most medical laboratory departments. Professionalism, medical terminology, concepts of quality control and quality assurance, general principles of laboratory policies and laboratory information flow are also covered.

MLAB 102 MLT Fundamentals 2 — See MLAB 101

MLAB 103 Clinical Chemistry — An introduction to the various laboratory instruments used in the chemical analysis of biological specimens with emphasis on principles, components, operation and maintenance of these instruments, forms the initial part of this course. The latter and major portion of the course deals with the analysis of various constituents of body fluids including protein and related nitrogenous substances, electrolytes and blood gases, enzymes, carbohydrates and lipids. Emphasis is placed on the metabolism, function, measurement and relationship of the levels of these various substances to disease states.

MLAB 104 Clinical Microbiology — Provides a detailed study of clinical microbiology theory, laboratory methodology and techniques. Emphasis is on understanding the interrelationships between the characteristics of microorganisms, their natural habitats, sources of infection, pathogenicity for man and the detailed methodology used by the clinical laboratory technologist to isolate, identify and test the antibiotic susceptibility of human pathogenic organisms. Through practical laboratory sessions, the student develops the basic skills and understanding required to correctly perform and interpret clinical microbiology tests and procedures.

MLAB 105 Hematology — This course is designed to enable the student to become proficient in the manipulative skills required to perform hematological laboratory tests and to acquire the theoretical and practical knowledge to interpret the data resulting from these tests. It provides a detailed study of the origin, development and function of blood and its cellular components; a study of blood diseases and blood coagulation. The theory and practical application of hematological instrumentation is also studied in detail.

MLAB 106 Histotechnology — A detailed study of the theory and practical applications of the techniques used in the histopathology laboratory to preserve and prepare body tissues for microscopic examination and diagnosis. The course is designed to introduce students to the principles of normal histology and microanatomy, to provide the opportunity to perform techniques in current use and to examine the results, to prepare students to work in the histopathology laboratory.

MLAB 107 Immunohematology — Uses the sciences of genetics and immunology to explore the major antigen systems of human blood. The practical importance of these systems is applied to the technology of blood and blood component transfusion, and the investigation of the immune hemolytic anemias.

MLAB 203 Clinical Chemistry — See MLAB 103.

MLAB 204 Clinical Microbiology — See MLAB 104.

MLAB 205 Hematology — See MLAB 105.

MLAB 206 Histotechnology — See MLAB 106.

MLAB 207 Immunohematology — See MLAB 107.

MLAB 210 MLT Correlation — The topics discussed in this course will include professionalism, ethics, career prospects available to graduates from this program, the fundamentals of laboratory management and laboratory organization. Through a short series of case study seminars, the interrelationship between the five major MLT subject areas will be emphasized.

Medical Radiography Technology

Department of Radiological Technical Services

The medical radiographer is an x-ray technologist who works as part of a health team composed of radiologists, internists, surgeons, nurses, laboratory technologists, biomedical technologists, nuclear medicine technologists, sonographers and other specialists. Radiographs are widely used as an aid in making medical diagnoses. A radiograph (x-ray) may be a routine film of the chest or a broken finger, or it may form part of the sophisticated examinations used in the detection of heart, blood vessel or brain abnormalities. Radiographers work under the direction of a medical specialist (a radiologist), and may work in the hospital radiology department, at the patient's bedside or in the operating room. Radiographers are also employed in private x-ray clinics. Medical radiography is not a hazardous occupation. The dangers of radiation are well-recognized and rigidly controlled. The conscientious radiographer can derive much personal satisfaction as a contributor to the success of the health team and the well being of the patient. Medical Radiography is a field suited to both men and women.

During training, medical radiography students receive intensive theoretical and practical instruction in lectures, labs and tutorials at BCIT, as well as practical experience in hospitals. Beginning in Level 3 of the program, students spend alternate 2 week periods at BCIT and in a hospital. A final 12 months clinical training must be completed at one of the participating hospitals (five in the Lower Mainland; two in the Interior; one on Vancouver Island). This additional training is a prerequisite for writing the certification examination set by the Canadian Association of Medical Radiation Technologists. Students can expect to be sent to any of the eight hospitals for their final 12 months of clinical experience.

Job Opportunities

BCIT graduates in medical radiography find employment in hospitals and private clinics, which may employ from one to thirty-five technologists. Most x-ray technologists work a thirty-seven point five hour week with the usual statutory holidays. Night work and on-call duty may be necessary, depending on the requirements of the department. It is also possible to work outside Canada since certification by the Canadian Association of Medical Radiation Technologists is recognized in the U.K. and several other countries.

Prerequisites

Algebra 12, Physics 11, Biology 11, Physics or Biology 12, with C+ average in required prerequisites. C.P.R. level I certificate required.

Basic typing skills and an introductory computer course are considered assets for selection into this program as well as some type of volunteer work such as "candy stripping".

Applicants must have a strong sense of responsibility, an interest in the welfare of others, particularly the sick and injured, and meticulous work habits.

*Please note: This program is currently under revision. In all probability, the next intake of students will be in January, 1988. The new program will be 25 months in length. Please refer to



the following page for an outline of the revised program. Application for the January 1988 program will be accepted beginning January 1987.

Students must complete an immunization program. A preadmission interview with the program head of Medical Radiography is conducted to assess the applicant's suitability for this field. Students are expected to be competent in written and oral English. The applicants suitability for the program is also assessed by hospital staff following a visit to a radiology department by the applicant.

Faculty and Staff

Mr. R. Mabbett, R.T., Department Head
Mrs. S.G. Hundvik, R.T.
Mrs. D. Kaplun, R.T., A.C.(R)
Miss A. McMillen, R.T., Dipl. Hlth. Care Mgt., Program Head
Mr. E. Seeram, B.Sc., R.T.
Mr. R.J. Smith, D.S.R., R.T.
Miss O.H. Triska, A.C.(R), (N.M.), Dipl. Adult Ed.
Mrs. I. Williamson, R.T.
Miss M. Morasky

Revised Program

Year One	(January, 1988)	Credit
Level 1 January to May (20 weeks)		
BHSC 107	Anatomy and Physiology	7.0
GNNU 180	Patient Care	4.0
MRAD 101	Radiographic Procedures	8.0
MRAD 102	Imaging	4.0
MRAD 106	Clinical Experience	9.0
PHYS 109	Physics	7.0

39.0

	Credit
Level 2 June (4 weeks)	
MRAD 206 Clinical Experience	9.0
Level 3 September to December (15 weeks)	
GNNU 380 Patient Care	1.5
MRAD 301 Radiographic Procedures	4.0
MRAD 302 Imaging	1.5
MRAD 303 Anatomy and Physiology	3.0
MRAD 306 Clinical Experience	17.5
MRAD 307 Pathology	1.5
PHYS 309 Physics	1.5
MRAD 308 Case Studies	1.0
	31.5

Year Two

Level 4 January to May (18 weeks)	
HCOM 402 Communications for Health Technologists	2.0
MRAD 401 Radiographic Procedures	4.5
MRAD 403 Radiographic Anatomy and Physiology	1.0
MRAD 404 Special Procedures	2.0
MRAD 405 Radiation Biology and Protection	1.5
MRAD 406 Clinical Experience	17.5
MRAD 407 Pathology	2.0
MRAD 408 Case Studies	1.0
MRAD 410 Radiographic Evaluation	1.0
	32.5

Level 5 May to April (52 weeks)	
MRAD 506 Clinical Experience	37.5

Course Descriptions

BHSC 107 Basic Anatomy and Physiology — A systematic study of the basics of human anatomy and physiology which prepares the student for MRAD 203, Radiographic Anatomy and Physiology. Included are basic physiological chemistry, cytology and histology.

GNNU 180 Patient Care — Introduces students to the basic safety concepts of patient care. It includes observational and communication skills, body mechanics, fire safety and medical and surgical asepsis. This course also introduces the basics of the psychological and social environments of the health care organization.

GNNU 380 Patient Care for Medical Radiographers — Provides the student with advanced concepts and techniques necessary to meet the comfort and safety measures of patients undergoing x-ray examinations. Emphasis is placed on patients who have complex problems such as altered consciousness, altered body sensation, various traction, drainage and suction devices and problems that require emergency action. Prerequisite: GNNU 180.

HCOM 402 Communication for Health Technologists — Emphasizes clear, correct, health-oriented technical writing for medical radiographers. Students will learn how to organize and sequence information, how to communicate effectively with patients orally and in writing, how to document patient care objectively and concisely, and how to plan and write effective memos.

MRAD 101 Radiographic Procedures and Related Anatomy — An introduction and orientation to the field of radiography will be presented together with a brief introduction to x-radiation protection practices. Radiographic procedures of the upper extremities together with the associated radiographic anatomy will be included. Patient positioning skills and basic principles of image quality will be reinforced in the laboratory sessions.

MRAD 102 Medical Imaging — Introduces students to the standard equipment used in the production of a radiograph. Fundamentals of the photo-recording system are introduced. Also studied are the basic factors of x-ray exposure, transformers, simple electrical controls, x-ray film construction and the various film holders, automatic processing and sensitometry. Laboratory work related to all these subjects is included.

MRAD 106 Clinical Experience — Students are orientated to the clinical area and gain basic experience in basic radiographic techniques.

MRAD 206 Clinical Experience — The student acquires a basic knowledge of medical radiographic techniques by applying classroom and laboratory training to clinical situations in the affiliated hospitals.

MRAD 301 Radiographic Procedures — The radiographic procedures related to the lower extremities, vertebrae, thoracic cage and contents, and abdomen are studied including the radiography of the digestive, urinary and biliary systems. Five hours each week in the x-ray laboratory allow the student to practice positioning and x-ray the phantoms in the areas covered in class. Two hours a week are devoted to radiograph technique and evaluation. Prerequisite: MRAD 101.

MRAD 302 Medical Imaging — Rectification, control circuits, mobile units, serial-radiography, x-ray tubes, image amplifiers, C.C. television, video-recording and body section radiography comprise the apparatus studied in this course. The image-recording portion covers special processes, artifacts and image presentation. The basics of digital image processing technology are introduced including digital angiography, subtraction technique, C.T. scanning and magnetic resonance imaging. Quality assurance principles are covered. Prerequisite: MRAD 202.

MRAD 303/403 Anatomy and Physiology — In the first half of this course a detailed study is made of the human skeleton. In the second half, the body organs, glands, vessels and nerves are studied according to region. Throughout the course, the emphasis is upon surface anatomy, the radiographic appearance of structures, and the details of structure and function which are pertinent to radiographic procedures. Prerequisite: BHSC 107.

MRAD 306 Clinical Experience — See MRAD 206. Prerequisite: MRAD 206.

MRAD 307 Pathology — Students are introduced to pathologic terminology and the basic mechanisms underlying disease processes. The balance of the course deals with pathological conditions of bone. Laboratory sessions allow students to become familiar with the radiographic appearance of some of the more common bone pathologies.

MRAD 308/408 Case Studies — Designed to provide the bridge between classroom theory and clinical work. Working in groups, a case study is presented and students will discuss all aspects of the case including the anatomy and physiology, positioning, radiation protection, imaging and equipment issues, technique and patient care. Students will have the opportunity to develop analytical and planning skills in a laboratory setting.

MRAD 401 Radiographic Procedures — The skull is studied in detail with special emphasis on acquiring the necessary positioning skills. Students are expected to reinforce the classroom material in the x-ray laboratory. One hour a week is devoted to radiograph evaluation. This course runs concurrently with MRAD 306. Prerequisite: MRAD 201.

MRAD 404 Specialized Procedures — Includes discussion of the specialized radiographic procedures utilized to demonstrate the vascular tree, the central nervous system and the digestive, biliary and genito-urinary tracts. Also included is a brief discussion of pediatric radiography and C.T. scanning. Prerequisite: MRAD 302.

MRAD 405 Radiation Biology and Protection — The student is reintroduced to the basic interactions of radiation with matter. An in-depth study of intracellular responses to radiation is made. The latter part of this course deals with radiation pathology and human experience with radiation injury. The aims and objectives of radiation protection are discussed, as well as the various organizations responsible for establishing protection standards. The course then deals with regulations governing the use of diagnostic radiation and methods of reducing exposure to the patient, the technologist and fellow workers.

MRAD 406 Clinical Experience in Medical Radiology — The student is expected to apply the didactic knowledge and positioning skills gained at BCIT to the clinical situation. Experience is gained in patient interactions, body mechanics, patient positioning, patient care and emergency procedures. Special emphasis is placed on good interpersonal relationships and meticulous work habits.

MRAD 407 Pathology — This course, which follows MRAD 307, deals with pathological conditions affecting the remainder of the body. The student is also made aware of how pathology will affect technical factors used in the production of a diagnostic radiograph. Laboratory sessions allow the student to become familiar with the radiographic appearance of some of the more common pathologies.

MRAD 410 Radiography Evaluation — A systematic review of the radiographic examinations taught during Radiographic Procedures is carried out during Term 4. The student evaluates radiographs for positioning, image quality and structures demonstrated.

PHYS 109 Physics for Medical Radiography — An introductory course which emphasizes the application of physical phenomena in medical radiography. It includes the structural and physical properties of matter, static electricity, direct and alternating current, magnetism, mechanics, energy, wave motion, sound, thermodynamics, optics, quantum concepts, production of x-rays, interaction of x-rays with matter, radioactivity, x-ray tubes, radiation detection and the basics of digital radiography.

PHYS 309 Physics for Medical Radiography — See PHYS 109.

Nuclear Medicine Technology

Department of Radiological Technical Services

Nuclear medicine is the application of radioactive materials to the diagnosis and management of disease in humans. It is primarily a diagnostic speciality and one of the most challenging and exciting branches of medicine.

Radioactive atoms are chemically identical to stable atoms of the same species and can be introduced into the basic chemical structure of many compounds. The radiation that is emitted from the radioactive atoms in the compound permits the detection and measurement of the compound even within the human body. This provides a means of investigating normal and abnormal functions of specific chemical and physiological processes within a human being while those processes are going on. Virtually all physiological processes within the body are now measurable and can be "seen" using radio-compounds and sophisticated instrumentation. Nuclear technology is also employed to assay the extremely small concentrations of certain substances in blood plasma and other body materials.

Nuclear medicine is responsible for a host of revolutionary, safe, non-invasive diagnostic procedures that are now available to physicians in all branches of medicine.

Job Opportunities

A nuclear medicine technologist performs the diagnostic procedures of nuclear medicine. Certified graduates work primarily in the nuclear medicine departments of hospitals. In addition to performing a wide variety of tests on patients, the technologist may also perform lab tests on patients' samples, prepare radiopharmaceuticals for injection into patients, record test results, receive, handle, record, store and measure radioactive materials and perform quality control procedures on a wide variety of instrumentation and imaging devices.

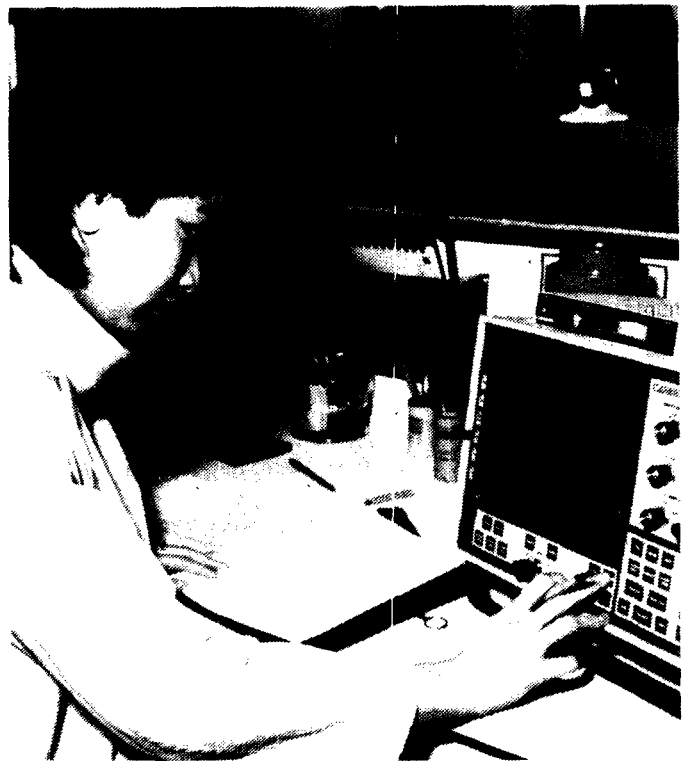
The Program

Designed to prepare graduates to function as technologists in nuclear medicine departments, the program is a combination of lecture and lab instruction at BCIT and clinical experience in the nuclear medicine departments of clinical facilities presently affiliated with the program.

The student will spend terms 1 and 2 of first year at BCIT for lectures and labs in basic subjects applicable to nuclear medicine technology and patient care. The Institute is equipped with a lab containing facilities and equipment commonly used in nuclear medicine departments. The student spends the summer term of first year in the nuclear medicine department of a hospital.

In the second year at BCIT, the student spends alternate weeks at BCIT and the nuclear medicine department of one of the Lower Mainland hospitals. The summer term of second year is spent in a nuclear medicine department gaining further clinical experience.

On successful completion of the two year (six term) program, the student receives the BCIT Diploma of Nuclear Medicine Technology and is eligible to write national certification examinations.



Post-graduation

Graduates of the BCIT program are eligible to take the National Certification Examinations set by the Canadian Association of Medical Radiation Technologists. Successful candidates may use the designation R.T. (N.M.) after their names and work as registered nuclear medicine technologists anywhere in Canada or in many parts of the world. An Advanced Certification is available.

Prerequisites

Algebra 12, Chemistry 11 and 12 and one other science 11 are course requirements for this program. Applicants must be competent in oral and written English. Preference is given to those applicants who have Physics 11. Since the work is highly technical and exacting, the student must feel comfortable with complex instruments, possess considerable manual dexterity and have meticulous work habits. Applicants must have a strong sense of responsibility and a desire to work with patients of all age groups. Nuclear Medicine technology is open to men and woman.

A preadmission interview is conducted by members of the Nuclear Medicine Technology program faculty who will assess applicants' suitability for the field and their communication skills. Applicants must undergo a medical examination by their own physician and have a complete updating of immunizations. Applicants selected for the program are required to complete the St. John Ambulance Safety Oriented First Aid course "Emergency First Aid" or its equivalent prior to admission, or during the first term of the program.

Faculty and Staff

Mr. R. Mabbett, R.T., Department Head
Ms. B. Clark, R.T., (T. & N.M.), Program Head
Miss J. Miki, R.T. (N.M. and C.S.L.T.)
R.A. Singer, R.T.(N.M.)
Miss M. Morasky

PROGRAM: Nuclear Medicine Technology

Level 1		Credit
BHSC 106	Anatomy and Physiology.....	4.0
BHSC 126	Basic Medical Microbiology and Immunology	2.0
CHEM 106	Chemistry for Nuclear Medicine Technology 1	6.0
MATH 174	Basic Technical Mathematics for Nuclear Medicine.....	5.0
MLAB 109	Clinical Laboratory Orientation	3.0
NMED 107	Radioassay Procedures	4.0
PHYS 105	Basic Physics for Nuclear Medicine Technology.....	6.0
Level 2		
BHSC 206	Anatomy and Physiology.....	6.0
CHEM 206	Chemistry for Nuclear Medicine Technology 2	9.0
GNNU 181	Patient Care	4.0
MATH 274	Statistics for Nuclear Medicine Technology.....	7.5
NMED 204	Applied Physiology	2.0
NMED 205	Radiobiology and Protection	2.0
NMED 207	Radiopharmaceuticals	4.0
PHYS 205	Radioactivity and Instrumentation	10.5
Summer		
NMED 209	Clinical Experience in Diagnostic Procedures	15.0
Level 3		
BHSC 306	Pathophysiology.....	4.0
HCOM 103	Communication for Health Technologists ..	1.5
NMED 304	Applied Physiology	9.0
NMED 305	Clinical Experience in Diagnostic Procedures	11.5
NMED 308	Imaging.....	1.0
PHYS 305	Radioactivity and Instrumentation	3.0
Level 4		
BHSC 439	Human Behavior	3.0
HCOM 202	Communication for Health Technologists ..	3.0
NMED 404	Applied Physiology	12.0
NMED 405	Clinical Experience in Diagnostic Procedures	21.0
PHYS 405	Radioactivity and Instrumentation	6.0
Summer		
NMED 409	Clinical Experience in Diagnostic Procedures	15.0

Course Descriptions

BHSC 106 Anatomy and Physiology — An examination of human structure and function based on a systems approach. Included are basic cytology and histology, and the endocrine, nervous and skeletal systems. Remaining systems are covered in BHSC 206.

BHSC 126 Basic Medical Microbiology and Immunology — Deals with basic properties of medically important micro-organisms, the communicability of infection, host-parasite relationships, methods of destruction and control of micro-organisms, with particular attention to the safe preparation of radio pharmaceuticals used for injection. The course also deals with basic immunologic concepts including their related in-vitro applications.

BHSC 206 Anatomy and Physiology — This is a continuation of BHSC 106 and covers the cardiovascular, lymphatic, respiratory, digestive, urinary and reproductive systems. Emphasis is placed on homeostatic control systems. Prerequisite: BHSC 106.

BHSC 306 Pathophysiology — An introduction to the principles of pathology based on a disease process approach. Some systems pathology commonly investigated by nuclear medicine procedures is discussed along with some complex patterns of disease. Prerequisite: BHSC 206.

BHSC 439 Human Behavior — An introduction to the basics of the psychological and social environments of health care organization, with the aim of understanding how communication patterns affect task activities. Prerequisite: BHSC 339.

CHEM 106 Chemistry for Nuclear Medicine Technology 1 — This course covers basic general chemistry. It includes stoichiometry, nomenclature, concentrations of solutions (molarity, molality, equivalent weight, PPM, percent), acid-base chemistry (strong and weak electrolytes, buffers, hydrolysis of salts) and electrochemistry (oxidation, reduction, voltaic cells, nernst equation). The laboratory part of the course which runs parallel with the lectures consists of quantitative analysis, both gravimetric and volumetric.

CHEM 206 Chemistry for Nuclear Medicine Technology 2 — Gives an introduction to organic and biochemistry. The naming, properties and main reactions of the major classes of organic compounds are discussed. Coordination compounds are studied with emphasis on the chelating agents used in nuclear medicine. The biochemistry includes both the chemistry and metabolism of fats, proteins and carbohydrates. Lab work includes techniques and synthesis in organic chemistry and biochemical techniques frequently encountered in the clinical lab, e.g.: spectrophotometry, chromatography, electrophoresis. Prerequisite: CHEM 106.

GNNU 181 Patient Care — Assists the student to understand the hospital environment and the health problems of the patient. Emphasis will be placed upon observation and communication appropriate to the nuclear medicine technologist. The nursing lab will be used to practice basic technical skills and procedures required in emergency situations.

HCOM 103 Communication for Health Technologists — Introduces students to the communication needs of the nuclear medicine profession — communicating with supervisors and patients. The course includes organizing and explaining information, objective and subjective descriptions, specialized journal research, information memos and oral briefings. It also covers medical terminology.

HCOM 203 Communication for Health Technologists — A continuation of HCOM 103. The course covers the specific communication tasks required of nuclear medicine technologists: short reports and action memos, persuasive presentations and meetings. It also covers the job package and medical terminology. All assignments are based on nuclear medicine case studies.

MATH 174 Basic Technical Mathematics for Nuclear Medicine — Exponential/logarithmic theory and transformations, common and natural logarithms, logarithmic/semilogarithmic graphs, and exponential growth and decay. Curve stripping, ratio, proportion, and variation. Delta-process, the derivative, differentiation rules including logarithmic and exponential functions, instantaneous rates of change, applied maxima/minima, the differential, anti-derivatives, indefinite integral, and definite integral with area under a curve and average value. Differential equations.

MATH 274 Statistics for Nuclear Medicine Technology — Organization and graphical presentation of data, frequency distributions and measures of central tendency and variation. Probability theory and laws. Random variables, mathematical expectation and discrete and continuous theoretical distributions. Estimation and hypothesis testing with both large and small samples. Method of least squares and regression and correlation. Non-parametric statistics.

MLAB 109 Clinical Laboratory Orientation — An introduction to the principles and uses of precision instruments employed in the lab, together with an introduction to hematology pertinent to the nuclear medicine lab.

NMED 107 Radioassay Procedures — Covers the basic principles of radioassay procedures. A study is made of the components of the test system, the practical aspects of performing the tests and data reduction techniques. The clinical significance of routinely performed assays is discussed.

NMED 204 Applied Physiology — Involves familiarization with affiliated Nuclear Medicine departments of lower mainland hospitals, and a series of lectures given by technologists on the clinical applications of nuclear medicine techniques.

NMED 205 Radiobiology and Protection — A detailed study of ionizing radiation and its interaction with matter. The units and safety guidelines of radiation are also discussed. Emphasis is on the practical applications of radiation safety in the working environment.

NMED 207 Radiopharmaceuticals — A study of the preparation and quality control of radiopharmaceuticals in routine use. Emphasizes the radio-nuclide generator. Dosage forms and calculation and dispensing of doses are covered, together with the clinical application of various pharmaceuticals.

NMED 209 Clinical Experience in Diagnostic Procedures — These courses require full-time attendance in the nuclear medicine department of an affiliated hospital. The purpose is to further develop the skills necessary for students to function safely and adequately in a nuclear medicine lab. Hands-on experience will be gained in all aspects of "in vitro" and "in vivo" procedures.

NMED 304 Applied Physiology — The student is instructed in all aspects of current applied physiology including criteria, methodology, instrumentation, patient problems and approach, data collection and manipulation.

NMED 305 Clinical Experience in Diagnostic Procedures — See NMED 209.

NMED 308 Imaging — Designed to familiarize Nuclear Medicine Technology students with the many methods and materials used to visually display the spatial distribution of radioactivity in nuclear imaging procedures. The utilization of optical, photographic, video tape and computer visual displays will be covered in theory and practice.

NMED 404 Applied Physiology — A continuation of NMED 304. The student is instructed in all aspects of current applied physiology including criteria, methodology, instrumentation, patient problems and approach, data collection and manipulation.

NMED 405 Clinical Experience in Diagnostic Procedures — See NMED 209.

NMED 409 Clinical Experience in Diagnostic Procedures — See NMED 209.

PHYS 105 Basic Physics for Nuclear Medicine Technology — A special introductory level course covering topics of forces and motion, energy, static electricity, DC electricity, magnetism, AC electricity, atomic structure, nuclear structure and nuclides.

PHYS 205 Radioactivity and Instrumentation — The theory portion of this course includes topics on nature and production of x-rays, measures of radioactive decay, modes of decay, and interaction of radiation with matter and nuclear reactions. The measurement portion of the course concentrates on instrumentation. Topics include an in-depth study of scintillation-type detector systems and Anger-type gamma cameras.

PHYS 305 Radioactivity and Instrumentation — Continues the instrumentation work begun in PHYS 205. Topics include sensitivity and resolution in scanning, collimators, liquid scintillation counting, G.M. detectors, proportional counters, ionization detectors, semiconductor detectors, TLD, positron scanning and spectrometry.

PHYS 405 Radioactivity and Instrumentation — Completes the instrumentation work begun in PHYS 205 and PHYS 305. Topics include sensitivity and resolution in scanning, collimators, liquid scintillation counting, G.M. detectors, proportional counters, ionization detectors, semiconductor detectors, TLD, positron scanning and spect. Includes an introduction to computers and their uses in Nuclear Medicine.

Diagnostic Medical Sonography

Post-diploma Program

Department of Radiological Technical Services

Diagnostic ultrasound is a rapidly emerging, relatively new medical diagnostic technique. Using high frequency sound waves transmitted and reflected through various body parts, it is possible to image organs, masses and fluid collections within the body. The technique provides valuable diagnostic information. Unlike x-rays, ultrasound waves are non-ionizing. Diagnostic ultrasound energy is non-invasive and non-traumatic, to date no significant biological effects have been demonstrated.

The field of Diagnostic Medical Sonography is dedicated to the preservation of life and health by diagnosis and prevention of disease. The diagnostic medical sonographer (ultrasound technologist) is a skilled person, qualified by academic and clinical training to provide patient services using diagnostic ultrasound. Sonographers work under the supervision of a doctor of medicine, qualified in the use and interpretation of ultrasound procedures. Studies performed by the sonographer include: echocardiography, abdominal sonography, obstetrical/gynecological sonography, ophthalmic sonography, and neonatal brain sonography.

Job Opportunities

Graduates in this dynamic new allied health field will assume an important role in maintaining high quality patient care, provide leadership in the development of health programs, and participate in medical research. Employment opportunities exist in hospital ultrasound facilities, or integral sections of other hospital departments, such as radiology, cardiology or obstetrics. A large percentage of hospitals in B.C. have diagnostic ultrasound equipment, and its use is expanding rapidly.

The Program

Due to the entrance requirement of knowledge in allied health, the program is only one year in length. The first term is primarily devoted to the study of the theory of diagnostic ultrasound. The clinical aspects comprise the larger portion of the second term. Clinical training is provided in selected hospitals in B.C. The course of studies includes anatomy and physiology, pathophysiology, physics of ultrasound, instrumentation and applied sonography.

Upon successful completion of the program, the graduate is eligible to write the American Registry of Diagnostic Medical Sonographers examinations.

Prerequisites

Diploma of Technology in an allied health field such as Radiography, Nuclear Medicine, or Registered Nursing, or a Bachelor of Science in an appropriate health related field.

Selection Criteria

Acceptance into the program will be based on: post-secondary education transcripts, previous educational and professional achievements, previous clinical experience, an autobiographical letter outlining the reasons for your interest in Diagnostic Ultrasound as a career and a letter of reference from a physician and/or from a post secondary academic faculty member with



whom you have worked. Based upon the documentation submitted, the most suitable applicants will be invited to an interview.

Faculty and Staff

Mr. R. Mabbett, R.T., Department Head
Ms. K.A. McDiarmid, R.T., R.D.M.S.

PROGRAM: Diagnostic Medical Sonography

Level 1		Credit
BHSC 108	Anatomy and Physiology.....	3.0
BHSC 109	Pathophysiology.....	3.0
DSO 101	Applied Sonography.....	7.0
DSO 105	Clinical Experience.....	12.5
PHYS 523	Physics of Ultrasound.....	4.5
Level 2		
DSO 206	Clinical Experience in Echocardiography..	20.0
DSO 306	Clinical Experience in Abdominal Sonography.....	20.0
DSO 307	Clinical Experience in Obstetrical and Gynecological Sonography.....	20.0

Course Descriptions

BHSC 108 Anatomy and Physiology — Provides an overview of the organ systems of particular clinical interest to sonographers. Special emphasis is placed on the genito-urinary, digestive (including liver, gall bladder and pancreas) and cardiovascular systems. In addition, longitudinal foetal development is discussed and cross-sectional anatomy of the abdominal/pelvic cavity is examined.

BHSC 109 Pathophysiology — An outline of the etiology and pathogenesis of those diseases commonly investigated by ultrasonography. The course is divided into three equal sections: obstetric gynecologic pathology, abdominopelvic organ pathology and cardiography. General principles of the disease process and complex syndromes will also be discussed.

DSO 101 Applied Sonography — Encompasses an in-depth study of techniques required for competency in echocardiography, abdominal sonography and obstetrical and gynecological sonography. Image production and the recognition of normal and abnormal patterns are stressed, as well as examination protocols for all major areas of interest.

DSO 105 Clinical Experience — Time is spent in hospital ultrasound Departments to obtain clinical and practical experience in support of classroom studies.

DSO 206 Clinical Experience in Echocardiography — The student will acquire the skills to carry out sonographic examinations and the ability to recognize normal and abnormal sonographic patterns in the heart.

DSO 306 Clinical Experience in Abdominal Sonography — The student will acquire the skills to carry out sonographic examinations and the ability to recognize normal and abnormal sonographic patterns in the abdomen.

DSO 307 Clinical Experience in Obstetrical and Gynecological Sonography — The student will acquire the skills to carry out sonographic examinations and the ability to recognize normal and abnormal sonographic patterns in the female pelvis.

PHYS 523 Physics of Ultrasound — Introduces students to the instrumentation used in ultrasound, and to the nature of the imaging process and the biological effects of ultrasound. Course topics include the physics of acoustic waves, transducers, ultrasonic fields, ultrasonic imaging, basic pulse echo instrumentation, real time systems, cathode ray tubes, doppler effect, acoustic power measurement, testing and calibration and biological effects.

General Nursing

Department of General Nursing

Today's registered nurse assists people in meeting health needs in collaboration with other members of the health care team including dietitians, occupational therapists, pharmacists, physicians, physiotherapists and social workers. Demands made upon nursing professionals range from providing information on health concerns to promoting proper health care, preventing disease, providing restorative care and emotional support. Proficiency is required in problem-solving and decision-making and in interpersonal, communicative and psychomotor skills. Although it is a high-stress profession, both men and women find general nursing a rewarding career.

Job Opportunities

Registered nurses are employed in general hospitals and community agencies. Positions for the new graduate are available mainly in medical and surgical units.

The Program

The Program is approved by the Registered Nurses' Association of British Columbia. Graduates are eligible to write the registration examinations of the Association. Graduates are prepared for employment in general hospitals or other health care agencies where comparable levels of patient care and nursing judgement are required. The program provides 22 months of instruction during a 2.33 year period. Enrolment in the program is in January or August of each year. The program provides instruction in Nursing, Basic Health Sciences and English. Learning opportunities include: independent study, lectures, laboratories, tutorials, and experience with medical, surgical, obstetrical, pediatric and psychiatric patients and families.

Independent study is based on printed modules that contain objectives, pre-tests, learning activities, post-tests and reference lists. Students are expected to have completed the module on their own prior to associated classroom or laboratory activities. In the classroom or laboratory, the instructor responds to questions and provides activities designed to assist students to integrate their learning or to apply it to clinical practice. To be successful in modular instruction, students should be self-directed, disciplined and have well-developed reading, study and organization skills. Remedial courses on these skills are available at many post-secondary institutions, particularly the colleges, and BCIT. Some high schools offer such courses in their evening programs.

Students will complete a program consisting of five terms. Each term is 17 weeks in length. The fall term extends from mid-August to mid-December and the winter term from January to mid-May. Students are free of studies from mid-May to mid-August.

Admission Requirements

Applicants must have all the admission requirements completed at least one month prior to registration to be eligible for a seat.

A. Applicants under 23 years of age at the time of entry into the program:

1. Senior secondary school graduation, with:

a) Chemistry 11 and either Chemistry 12 or Biology 12 (preferred) with a minimum of C+ standing in both courses.



b) Algebra 11 with a minimum of C standing.

c) English 12 with a minimum of C+ standing.

2. Experience as an employee working with patients in a hospital or Extended Care Unit with a satisfactory reference.
or
Full-time or part-time work experience in any field with a satisfactory reference and 30 hours volunteer experience with patients in hospital or Extended Care Unit, with a satisfactory reference.
or
Six months (2-4 hrs per week) volunteer work experience with patients in a hospital or Extended Care Unit, with a satisfactory reference.
3. Completion of the immunization program is required before final acceptance into the program.
4. A physical examination by a physician of the applicant's choice, indicating satisfactory health.
5. A satisfactory interview with a member of the General Nursing Department who will assess the applicant's:
 - knowledge and motivation towards a nursing career
 - appreciation of the financial costs of the program
 - appreciation of the stress of the program
 - demonstrated communication skills.
6. A valid St. John Ambulance standard First Aid certificate or equivalent is required by the end of term 1, and preferably prior to entry into term 1.

B. Applicants over 23 years of age at the time of entry into the program:

1. Senior secondary school graduation or equivalent e.g. G.E.D. or BTSD, with Chemistry 11 and either Chemistry 12 or Biology 12 (preferred) to be completed within two years prior to enrolment with minimum of C+ standing in both courses.
2. Experience as an employee working with patients in a hospital or Extended Care Unit with a satisfactory reference.
or
Full-time or part-time work experience in any field with a satisfactory reference and 30 hours volunteer experience with patients in hospital or Extended Care Unit with a satisfactory reference.
or
Six months (2-4 hr per week) volunteer work experience with patients in a hospital or Extended Care Unit with a satisfactory reference.
3. Completion of the immunization program is required before final acceptance into the program.
4. A physical examination by a physician of the applicant's choice, indicating satisfactory health.
5. A satisfactory interview with a member of the General Nursing Department, who will assess the applicant's:
 - knowledge of and motivation towards a nursing career
 - appreciation of the financial costs of the program
 - appreciation of the stress of the program
 - demonstrated communication skills
6. A valid St. John Ambulance standard First-Aid certificate or equivalent is required by the end of term 1 and, preferably, prior to entry into term 1.

Notes:

1. Applications are accepted for review beginning January 2 for the August class and June 1 for the January class.
2. Applicants with baccalaureate degrees within five years will be assessed on an individual basis to determine equivalency with academic criteria.
3. C.P.R. (Basic 1) certificate is prerequisite to Term 4. It must be current during both Terms 4 and 5.

Expenses

In addition to tuition fees, students will spend approximately \$1,000 for textbooks and other learning materials during the program. Uniforms and shoes are about \$250. The student is responsible for transportation to hospitals and other community agencies. It is highly recommended that students have the use of a car two days per week for transportation to these agencies. Most students purchase a graduation pin for approximately \$150.

Financial Assistance

BCIT has a financial assistance program — scholarships, loans and bursaries. Details are available from Student Financial Services in the Counselling department.

Post-graduation

Following completion of the nursing diploma program, students

write the Canadian registration examinations in order to obtain the R.N. (Registered Nurse) designation. The fee for these examinations is \$135. After gaining some experience, graduates may elect to undertake one of the many post-diploma programs at BCIT or elsewhere in B.C., Canada or the U.S. to further their knowledge and skills in specialty areas of nursing. Most universities in major cities offer Bachelor of Nursing programs for graduates from diploma programs.

PROGRAM: General Nursing

Level 1	Credit
BHSC 105 Anatomy and Physiology.....	3.5
BHSC 118 Personal Fitness Management	2.0
BHSC 140 Human Development.....	3.5
GNNU 100 Nursing 1: Theory and Clinical	25.0

Level 2	
BHSC 205 Physiology	3.5
BHSC 225 Microbiology.....	1.0
BHSC 226 Immunology	1.0
BHSC 239 Sociology.....	1.5
BHSC 240 Human Development.....	1.5
GNNU 200 Nursing 2: Theory and Clinical	24.0

Level 3	
GNNU 300 Nursing 3: Theory and Clinical	29.5
HCOM 107 Writing for General Nurses	3.5

Level 4	
GNNU 400 Nursing 4: Theory and Clinical	28.0
HCOM 109 Modern Literature for General Nurses.....	3.5

Level 5	
GNNU 450 Nursing 5: Theory and Clinical	42.0

Course Descriptions

BHSC 105 Anatomy and Physiology — A survey of the basic structure and function of human body systems. An introduction to the basic principles of genetics is also included.

BHSC 118 Personal Fitness Management — A combined theory and practice course designed to emphasize the relationship of physical fitness to lifestyle patterns. The focus is placed on the student's own activity pattern.

BHSC 140 Human Development — After an initial treatment of the topic of death and loss, this course focuses on the processes of growth and development from conception through adolescence. Physical, cognitive, affective and social development are surveyed with emphasis on relating developmental concepts to health care.

BHSC 205 Physiology — A study of physiological regulation and control based on the fundamentals established in BHSC 105. Prerequisite: BHSC 105.

BHSC 225 Microbiology — Provides an introduction to basic microbiological concepts, including the distinguishing characteristics of micro-organisms, methods of controlling infectious diseases and host-parasite relationships. Prerequisite: BHSC 105.

BHSC 226 Immunology — Provides an understanding of the immune response as applied to immunity, surveillance, homeostasis, hypersensitivity, autoimmunity and immunohematology. The course progresses from discussions on the components and biological activities of the immune response to the immune response role in protective as well as disease conditions. Prerequisite: BHSC 105, BHSC 225.

BHSC 239 Sociology — An introduction to the study of human behavior. Basic terminology and concepts of sociology are presented. Emphasis is placed on the study of the family as a social institution, as well as on other forms of group processes and collective behavior. The relationship between behavioral sciences and problems of health care is examined.

BHSC 240 Human Development 2 — Focuses on growth and development from young adulthood to aging adult. Physical, cognitive, affective and social development are surveyed. Emphasis is placed on relating developmental concepts to health care. Prerequisite: BHSC 140.

GNNU 100 Nursing 1: Theory and Clinical — An overview of the nursing curriculum and the study of individuals of adult age who require minimal or no assistance to satisfy needs. Emphasis is placed on the normal requirements for need satisfaction and the stressors associated with lifestyle patterns. The student is introduced to the basic concepts of the nursing process; psychomotor skills, interactive skills and the helping relationship; organization and responsibilities of the professional nurse. Concurrent theory, laboratory and clinical practice focus on basic assessment, interactive and psychomotor skills. Clinical experience is provided in acute and extended care units and community agencies.

GNNU 200 Nursing 2: Theory and Clinical — The study of individuals of adult age who require assistance to satisfy their needs. Emphasis is placed on stressors associated with selected stages and tasks of growth and development, and selected unanticipated events related to inflammatory disorders. The student will use selected interactive skills to initiate, maintain and terminate a helping relationship with patients. Concurrent theory, laboratory and clinical practice will focus on the nursing skills required to assist individuals to satisfy needs. Selected pharmacology content is integrated with core content as a therapeutic measure. The surgical patient is discussed to prepare the student for the clinical area. Clinical experience will be provided in hospital settings on adult general surgical units. Community visits will be integrated throughout the course. Prerequisite: GNNU 100, BHSC 105, BHSC 140.

GNNU 300 Nursing 3: Theory and Clinical — The study of individuals of all ages whose responses to stressors may be appropriate and/or inappropriate. Emphasis is placed on the stressors associated with both selected unanticipated events and with the selected growth and development stages and tasks of childhood and of childbearing. Concurrent theory, laboratory and clinical practice will focus on the nursing skills required to assist individuals to satisfy needs. Selected pharmacology content is integrated with core content as a therapeutic measure. Emphasis is placed on developing selected interactive skills to initiate, maintain and terminate helping relationships with patients and involved family members. Clinical experience is provided in hospitals on family-centered maternity units and pediatric units. Community visits are integrated throughout the course. Prerequisite: GNNU 200, BHSC 205, BHSC 225, BHSC 226, BHSC 240.

GNNU 400 Nursing 4: Theory and Clinical — The study of individuals of all ages with inappropriate responses to stressors. Emphasis is placed on the stressors associated with selected unanticipated events and the stage and tasks of adolescence. Concurrent theory, laboratory and clinical practice focus on the nursing skills required to assist individuals to satisfy needs. Selected pharmacology content is integrated with core content as a therapeutic measure. Emphasis is placed on developing selected interactive skills to initiate, maintain and terminate helping relationships with patients and involved family member(s). Clinical experience is provided in hospitals on psychiatric and

general medical and surgical nursing units. Community visits are integrated throughout the course. Prerequisite: GNNU 300, CPR (Basic 1).

GNNU 450 Nursing 5: Theory and Clinical — Term 5 emphasizes the integration of previously presented knowledge and skills. Theory focuses on organizational and leadership skills and the responsibilities of the graduate nurse. Clinical experience is provided in general medical-surgical units. Students are assigned to full-time registered nurses who act as preceptors to the student. During this term, students learn to assume the role of a registered nurse. Prerequisite: GNNU 400, HCOM 107, HCOM 109, BHSC 118, BHSC 239, CPR (Basic 1).

HCOM 107 Writing for General Nurses — Nurses and student nurses spend several hours each day writing: completing assignments, documenting patient care, writing letters and memos, preparing written information for clients, writing procedures, completing reports and preparing oral presentations. This course teaches students the planning, writing and revising skills they need to perform these tasks efficiently and effectively.

HCOM 109 Modern Literature for General Nurses — Presents four genres of modern literature: the short story, drama, the novel and poetry. Students will be encouraged to use the literature, classroom discussions and the assignments as ways of expanding their experience, developing empathy and detachment, clarifying judgement and reflecting on their values and assumptions.

Certificate of Credit in Nursing

The Basic Health Science and English courses of the diploma nursing curriculum are offered through independent study as well as on campus. Applicants who meet the academic entrance requirements may wish to complete some of these courses prior to enrolment to lighten their study loads during the program. Students with lighter loads pay full fees as the nursing courses account for the majority of credits taken each term.

For information write to Health Part-time Studies, BCIT, 3700 Willingdon Avenue, Burnaby, B.C. V5G 3H2. These courses are offered in fall, winter and spring terms.

Faculty and Staff

Mrs. M. Neylan, M.A., B.S.N., R.N., R.P.N., Department Head
Ms. J. Anderson, R.N., B.Sc.N., M.A. (Education)
Mrs. L. Barratt, B.A., Diploma Psychiatric Nursing, R.N.
Ms. M.J. Belfry, M.Sc., B.N., R.N.
Mrs. D.M. Belyk, B.S.N., R.N.
Ms. L. Brazier, R.N., B.S.N.
Mrs. E. Carr, B.S.N., R.N.
Ms. V. Cartmel, B.S.N., R.N.
Ms. K. Doyle, B.N., Diploma Counselling Psychology, R.N.
Mrs. K. Edwards, B.S.N. (Honors), R.N.
Mrs. L. Field, B.Sc.N., R.N.
Ms. E.M. Fraser, B.S.N., R.N.
Mrs. S. Gallo, B.Sc., Ph.N., R.N.
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Mrs. A. Houseman, R.N., B.Sc.N.
Ms. E. Jackson, R.N., B.S.N.
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Mrs. M. LaBelle, B.N., Diploma P.H., R.N.
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Ms. A.J. Mazzocato, M.S.N., B.N., R.N.
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Mrs. L. Milligan, R.N., B.S.N.
Mrs. K. Negoro, Diploma Nrsng. Ed., R.N.
Mrs. A.L. Novada, B.S.N., Diploma T.S., R.N.
Mrs. M. Olson, B.S.N., R.N.
Mrs. K. Quee, B.Sc.N., R.N.
Ms. M.N. Renwick, B.S.N., Diploma T.S., R.N.
Ms. A. Rose, B.Sc., R.N.
Mrs. A. Taylor, M.A., B.S.N., R.N.
Mrs. J. Verner, B.S.N., R.N.
Mrs. M. Walmsley, M.Ed., B.S.N., R.N.
Mrs. M.W. Whitehead, M.A. (Educ.), B.S.N., R.N. Diploma Obs., R.N.
Ms. P.V. Zabawski, B.Sc.N., R.N.
Mrs. D. Zimka, B.Sc.N., R.N.

Support Staff

Mrs. P. Mushens
Mrs. F. Nordstrand
Mrs. P. Ord
Ms. C. Smith





Proposed new BCIT Campus Centre, 1987.

School of Management Studies

Office of the Dean

John D. Kyle, Ph.D., Dean
Lynne Larsson, Administrative Assistant/Executive Secretary to
the Dean

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Administrative Management Systems Technology

Many people who are contemplating a career in business management would like to acquire a solid core of knowledge and skills which can then be fitted to any area of the business community. Administrative Management Systems programs are designed for general application in business management, and at the same time, are particularly suited to qualify students to pursue careers in areas such as:

- General Managerial Functions
- Small Business Enterprises
- Microcomputer Applications
- Real Estate
- Human Resource Systems/
Personnel and Industrial Relations

Job Opportunities

Graduates of the **Administrative Systems Option** work in planning, banking, finance, production, marketing or real estate. Many now operate their own businesses.

Graduates of the **Human Resource Systems Option** become involved in manpower selection and placement, manpower training and development, labor-management relations, job evaluation, and organization renewal and development.

The Program

Following a year of general studies in a cross section of business courses, students select one of two options: Administrative Systems, or Human Resource Management Systems.

Students who enter the Administrative Management program will generally follow the course of studies shown as levels 1 through 4, with some changes in the offerings and order of courses as the department revises and updates the program to reflect changes in business and industry.

Students with access to a microcomputer outside the Institute will find this beneficial if they let their instructors know in courses such as ADMN 190 and ADMN 360.

Prerequisites

Algebra 11 and English 12, both with C+ or better, are required for this program. Enrolment is limited. Applicants should apply early, stating full details of work experience and outlining extra-curricular activities. Appropriate business experience and/or other successful post-secondary education will greatly strengthen applications. Applicants should be good communicators and people oriented, with a willingness to work effectively with fellow workers and the public.

Admission may be granted to mature students who can provide evidence of probable success in the program.

Specific Prerequisites

Those students wishing to enter the Human Resource Management Option from the first year of the technology program should have maturity and relevant work experience. They must also be competent in communication skills, as demonstrated by a minimum of 70% standing in the first year communication courses.



Direct Entry and Certificates

Direct entry into second year courses of the technology in either option is possible provided students have prerequisite first year courses and other suitable education or experience.

Students may qualify for a Certificate in Administrative Systems or Human Resource Systems by completing a total of 15 courses (full term), with a minimum of 10 courses from Levels 3 and 4. The student's program must be agreed to between the student and the Department to suit the student's career goals.

Post-graduation

Graduates may earn advance credit towards designation as a Chartered Accountant, a Certified General Accountant, or a Registered Industrial Accountant. Advance credit is also given by the Institute of Chartered Secretaries and Administrators.

Graduates who have completed the Real Estate courses and enter the real estate brokerage business are exempted from the salesman's pre-licensing course.

Faculty and Staff

C. Clark, B.A., M.A., Acting Department Head
M. Baxter, Dipl.Tech., CPHI(C)
G.E. Bissell, B.Comm., M.A.
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C.J. Dickhoff, B.A., M.A., (Econ.), M.A. (Public Admin.)
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R.A. Yates, LL.B., M.B.A.

TECHNOLOGY: Administrative Management Systems

		Clim hrs/wk
Level 1		
ADMN 100	Micro Economics.....	3.0
ADMN 110	Management 1.....	3.0
BCOM 102	Business Communication for Administrative Management.....	3.0
COMP 100	Data Processing, Introduction.....	3.0
FMGT 101	Accounting 1.....	4.0
MKTG 102	Introduction to Marketing.....	3.0
OPMT 110	Business Mathematics.....	4.0

Level 2		
ADMN 190	Microcomputer Skills.....	3.0
ADMN 200	Macro Economics.....	3.0
ADMN 211	Management 2.....	*3.0
ADMN 217	Workshop.....	2.0
ADMN 222	Organizational Behavior.....	*4.0
BCOM 202	Business Communication for Administrative Management.....	3.0
COMP 120	Computers in Business.....	3.0
FMGT 201	Accounting 2.....	4.0
OPMT 130	Business Statistics.....	4.0

* Half Term Courses

PROGRAM: Administrative Systems

Level 3		
ADMN 310	Management Science.....	3.0
ADMN 330	Industrial Relations.....	3.0
ADMN 340	Personnel Administration.....	3.0
ADMN 360	Microcomputer Software Systems.....	3.0
ADMN 385	Business Law.....	4.0
FMGT 304	Management Accounting.....	4.0
FMGT 307	Finance 1.....	4.0
MTKG 334	Applied Marketing and Sales.....	3.0

Level 4 All systems sets:		
ADMN 410	Management Policy.....	3.0
ADMN 490	Directed Studies.....	6.0
FMGT 404	Finance 2.....	4.0
FMGT 451	Principles of Credit.....	*4.0
OPMT 170	Management Engineering.....	4.0
TDMT 352	Transportation.....	*4.0

In addition students currently take one of:

ADMN 460	Microcomputer Software Systems.....	5.0
MKTG 411	Real Estate Management.....	7.0
or		
ADMN 420	Selected Topics in Business.....	*5.0
ADMN 462	Microcomputer Software Applications.....	*5.0

PROGRAM: Personnel and Industrial Relations

Level 3		
ADMN 310	Management Science.....	3.0
ADMN 321	Interpersonal Skills Development.....	2.0
ADMN 330	Industrial Relations.....	4.0
ADMN 340	Personnel Administration.....	3.0
ADMN 341	Human Resource Planning and Analysis.....	4.0
ADMN 360	Microcomputer Software Systems.....	3.0
ADMN 385	Business Law.....	4.0
FMGT 307	Finance 1.....	4.0

Level 4		Clim hrs/wk
ADMN 410	Management Policy.....	3.0
ADMN 430	Collective Bargaining.....	3.0
ADMN 440	Personnel Management Systems.....	3.0
ADMN 441	Interviewing Skills.....	*4.0
ADMN 442	Training and Development.....	*4.0
ADMN 490	Directed Studies 6.0.....	
FMGT 404	Finance 2.....	4.0
OPMT 170	Management Engineering.....	4.0

* Half term courses

Course Descriptions

ADMN 100 Micro Economics — The major areas studied are the product and resource market. Students analyze supply and demand, how production costs vary and how prices are determined in various market structures. In addition, resource allocation and economic policy implications are explored.

ADMN 110 Management 1 — A study of management functions and practices of planning, organizing and staffing. Included are such topics as forms of business ownership, tactical and strategic planning, decision-making, structuring the organization and providing human resources. Emphasis is varied depending on the technology for which the course is provided. Students are given the opportunity to develop analytical and communications skills by analyzing and presenting solutions to typical business problems.

ADMN 190 Microcomputer Skills — An introduction to microcomputers and software. Students become familiar with software programs to be used in other course areas.

ADMN 200 Macro Economics — Develops an understanding of the organization and operation of the Canadian Economy in an international setting. The theoretical tools of the economist are used to expend the concepts of national income employment, inflation, money and banking international trade, and growth. An appreciation of the relationship between economic theory and economic policy is provided. Prerequisite: ADMN 100.

ADMN 211 Management 2 — A continuation of ADMN 110. Management functions and practices of leading and controlling are emphasized. Topics include motivation, leadership, production planning and control, and budgeting. Prerequisite: ADMN 110

ADMN 217 Workshop — Students, working in small groups, contact a business or service organization to gather complete information on that organization — its history, organization structure, financial background, product/service, scope of operation, and marketing strategy. This information is presented to the class using audio visual techniques. Benefits to the students are a better understanding of the application of management theory and organization, and practice in formal class presentation.

ADMN 222 Organizational Behavior — The study of factors that either influence or are influenced by people at work. The course will focus on macro factors such as organizational structure, technology and environment; group factors such as group dynamics, leadership, conflict and decision making; and micro or individual factors such as attitudes, perception and motivation.

ADMN 310 Management Science — Emphasizes the use of decision-making models in business. It is designed to train students in the use of quantitative methods in the choice of alternatives in the decision-making process. Prerequisite: OPMT 110, OPMT 130.

ADMN 321 Interpersonal Skills Development — This lab concentrates on the development of skills for personnel problem solving. It emphasizes role-play training with students in advisory capacities, helping management and employees to resolve human resource management problems. Prerequisite: ADMN 222.

ADMN 330 Industrial Relations — A detailed analysis of selected labor/management problem areas with emphasis on the solution of practical existing problems in industrial relations.

ADMN 340 Personnel Administration — An introduction to the fundamentals of personnel management, including organization of the personnel function, salary administration, fringe benefits, training, management development and performance appraisal, constructive discipline, grievances and morale. Prerequisite: ADMN 222.

ADMN 341 Human Resource Planning and Analysis — An introduction to the skills and concepts associated with employee data collection and analysis for strategic and human resource planning purposes. Employment planning models, job analysis techniques and statistical methods of measurement are addressed.

ADMN 360 Microcomputer Software Systems — Instruction and practice with commercially advanced microcomputer software systems. Topics currently include integrated programs, the MS-DOS environment, and databases. Prerequisite: ADMN 190

ADMN 385 Business Law — A one-term, condensed course which acquaints the business student with a basic knowledge of Canadian law including the legal system, contracts, torts, sale of goods and consumer protection, secured transactions and creditors' remedies, employment law and agency, business organizations, negotiable instruments, real estate and administrative law.

ADMN 410 Management Policy — An analysis of business policy formulation designed to give the student practice, experience and confidence in handling business situations, including those of a complex nature where basic policy decisions are necessary to assist in problem solving. Comprehensive business cases will be selected covering such fields as finance, control, personnel, production, marketing and general management, for study and discussion. The course is designed to acquaint the student with the role of top management and the interrelationships between these fields. Prerequisite: All Level 1, 2 and 3 courses, or permission of Department Head.

ADMN 420 Selected Topics in Business — This course is designed to give students exposure to important issues for Canadian and British Columbian business. Content will vary from year to year depending upon current events and available faculty.

ADMN 430 Collective Bargaining — An introductory analysis of the fundamental issues and facts of labor-management relations. Special emphasis is given to collective agreement content and interpretation, bargaining and basic labor economics. Prerequisite: ADMN 330.

ADMN 440 Personnel Management Systems — Develops competence in several key personnel practitioner areas, including job evaluation techniques, wage and salary administration

functions, and performance appraisal techniques. Two hours a week of microcomputer applications laboratory time are included for preparation of course assignments that use microcomputer applications. Prerequisite: ADMN 340.

ADMN 441 Interviewing Skills — A skills development course emphasizing the interpersonal skills necessary for successful selection interviews. Training techniques include role-playing, individual counselling and feedback. Prerequisite: ADMN 321 and 340.

ADMN 442 Training and Development — Develops ability to design and implement a training program with emphasis on practical problems of training in industry. Prerequisite: ADMN 321 and 340.

ADMN 460 Microcomputer Software Systems — A continuation of ADMN 360 Microcomputer Software Systems, with emphasis on applying software to practical business problems. Students will learn the process of developing a software application: problem definition, design and development, and implementation. Prerequisite: ADMN 360, FMGT 201, OPMT 110.

ADMN 462 Microcomputer Software Applications — A nine week extension of ADMN 360 that currently focuses on the Macintosh computer. Topics will vary but currently exposure is given to basic business applications and an introduction to desk top publishing. Prerequisite: ADMN 360.

ADMN 490 Directed Studies — Designed to give students some practical application of concepts learned in major program areas by engaging in problem-solving projects in business or government. Prerequisite: All courses in Levels 1, 2 and 3, or permission of the Department Head.

BCOM 102 Business Communication for Administrative Management — This is an applied business communication course for Administrative Management. Students develop the skills required to write effective letters and memos used in business and industry. Students also receive instruction in preparing and giving oral presentations.

BCOM 202 Business Communication for Administrative Management — Gives further instruction and practice in the principles taught in BCOM 102. The course concentrates on more sophisticated forms of written communication: the job application package, informational and analytical reports and research proposals. It also includes modules on graphics, questionnaires, telephone techniques, organizing and running meetings and using word processors. Prerequisite: BCOM 102.

COMP 100 Data Processing — Introduction — Offers training in basic data processing principles to develop recognition of the application of these principles to industry. The principal functions of data processing are illustrated and practised with an H.P. minicomputer operating interactively. Elementary computer programs are written and tested on the computer. Use of flow-charting and elementary data processing systems design will illustrate the achieving of data processing objectives.

COMP 120 Computers in Business — Designed to give the student an understanding of business computer systems. Topics include computer hardware — types, usage, evaluation; systems development — feasibility studies, analysis, design, implementation; packaged software — use and evaluation. Emphasis will be placed on particular areas of interest to the specific technologies. Prerequisite: COMP 100.

FMGT 101 Accounting 1 — Permits persons with little or no accounting background to become familiar with the techniques of working through the full accounting cycle. It provides theoret-

ical and practical training in basic accounting as preparation for FMGT 201. Topics include accounting as an information system; introduction to accounting theory; income measurement; traditional record-keeping procedures; the accounting cycle; special journals; cash; investments and receivables.

FMGT 201 Accounting 2 — The follow-up to FMGT 101, topics include inventory, long-lived assets, liabilities, forms of business organizations, cash-flow and working capital analysis, manufacturing accounting, management accounting, consolidated statements, analysis of financial statements and price level changes. Prerequisite: FMGT 101.

FMGT 304 Management Accounting — The management accountant's role in decision making, planning and control of company operations through budgeting, standard costing and evaluation systems. Emphasis is on alternative methods of product costing, cost allocations, performance measurement and decision-making models. Prerequisite: FMGT 201.

FMGT 307 Finance 1 — Those with little or no knowledge of financial management will study the various methods of optimizing the economic position of a firm. Middle management people in business finance will learn to make the best decisions on the financing of a firm. Topics include control and financial management of the business firm, profit planning, cash and capital budgeting and inventory control. Prerequisite: FMGT 201.

FMGT 404 Finance 2 — Instructs students in raising capital to finance a firm. Topics include the cost of capital; short, medium and long term financing leasing; refinancing; security analysis; the Canadian capital and money markets and pension portfolios as they affect business decisions of the Canadian firm. Prerequisite: FMGT 307.

FMGT 451 Principles of Credit — An overview of the principles and procedures of various types of credit and their use by retail business, financial institutions, commercial enterprises and consumers. Includes sources of information, credit policy, control, and collections. A continuing case problem approach is used.

MKTG 102 Introduction to Marketing — Includes a detailed study of the basic marketing functions, marketing research, product planning, selection of trade channels, merchandising, advertising, sales promotion and salesmanship. Marketing of consumer goods as well as industrial goods will be covered.

MKTG 334 Applied Marketing and Selling — The focus is on applying the marketing concepts from the introductory marketing course with emphasis on developing personal selling skills. Students will develop a comprehensive plan for marketing and selling a product or service. Prerequisite: MKTG 102.

MKTG 311/411 Real Estate Management — The real estate function includes law, estates and interests in land, and the personal and business management decision process. The economic characteristics of urban real estate and the market, city growth and development, locational factors in influencing the determination of land use and ownership, institutional lenders, the mortgage market and the functions of the real estate agency, salesman and appraiser are covered. This is a credit course recognized by the Real Estate Council of British Columbia and the Department of Real Estate Studies at UBC. It exempts the student entering the real estate brokerage business from the salesman's pre-licensing course.

OPMT 110 Business Mathematics — Review of basic mathematics applicable to business and industry. Mathematics of finance including retail operations, simple and compound interest, discounts, annuities, financial papers and depreciation methods. Emphasis is on practical applications to business administration.

OPMT 130 Business Statistics — Major emphasis is on descriptive statistics, including numerical and graphical presentation of data, measures of central tendency and dispersion, elementary probability, index numbers and time series. Introduction to inferential statistics is provided through selected topics such as sampling, confidence limits of the mean, hypotheses testing and simple linear regression.

OPMT 170 Management Engineering — Industrial engineering approach to problem solving with particular application to administrative management problems. Includes method study, charting and analysis, work measurement, facility layout. Also provides training in production and inventory management. Prerequisite: OPMT 110.

TDMT 352 Transportation — Designed to give students a basic understanding of the operation of the four modes of transportation. The course highlights municipal, provincial and federal regulations/deregulations and introduces students to the essentials of freight rate applications and waybill audit. The course is tailored to users of transportation services. Prerequisite: OPMT 110, ADMN 385.

Prerequisite Guide for 1987

Course: Prerequisites required

Level 1: Acceptance into the program

Level 2:

ADMN 190	None
ADMN 200	ADMN 100
ADMN 211	ADMN 110
ADMN 217	None
ADMN 222	None
BCOM 202	BCOM 102
COMP 120	COMP 100
FMGT 201	FMGT 101
OPMT 130	None

Level 3:

ADMN 310	OPMT 110 and OPMT 130
ADMN 321	ADMN 222
ADMN 330	None
ADMN 340	ADMN 222
ADMN 341	None
ADMN 360	ADMN 190
ADMN 385	None
FMGT 304	FMGT 201
FMGT 307	FMGT 201
MKTG 311	MKTG 102, ADMN 200, and OPMT 110
MKTG 334	MKTG 102

Level 4:

ADMN 410	All level 1 through 3 courses or permission
ADMN 420	None
ADMN 430	ADMN 330
ADMN 440	ADMN 340
ADMN 441	ADMN 321 and ADMN 340
ADMN 442	ADMN 321 and ADMN 340
ADMN 460	ADMN 360, FMGT 201, and OPMT 110
ADMN 462	ADMN 360
ADMN 490	All level 1 through 3 courses or permission
FMGT 404	FMGT 307
MKTG 411	See MKTG 311
FMGT 451	None
OPMT 170	OPMT 110
TDMT 352	OPMT 110 and ADMN 385

This set of prerequisites applies to all first year students and part-time students starting in the Fall of 1987.

Business Administration

Post-diploma Program

Administrative Management Systems

Following some experience in the work force, engineering and health technologists may assume supervisory and managerial responsibilities. Although well-versed in the technical aspects of their fields, they could, in most cases, benefit from further training in business management to be effective administrators. To fulfill this training need, BCIT has developed a full-time diploma program in business management for graduates from health and engineering technologies or equivalent.

The Program

The nine month program includes such basic business subjects as management accounting, economics, marketing, law, personnel administration, data processing and microcomputer software applications. These courses will give students a thorough understanding of current business practice enabling them to apply a disciplined and professional approach to management. Lectures are supplemented by case studies and group discussions throughout the program. All students are required to carry a full course load each term.

Prerequisite

Diploma of Technology in Health or Engineering, or equivalent. Applicants should be interested in supervisory and managerial positions, or operating their own businesses. Previous business experience is preferable, but not mandatory.

Post-graduation

Graduates of this diploma program may work towards accreditation as a Certified Administrative Manager through the Administrative Management Society.

PROGRAM: Business Administration

	Clim hrs/wk
Level 1	
ADMN 100 Micro Economics.....	3.0
ADMN 310 Management Science.....	3.0
ADMN 361 Microcomputer Software Systems.....	3.0
ADMN 620 Organizational Behavior.....	3.0
BCOM 501 Advanced Business Communication.....	4.0
FMGT 519 Financial Management 1.....	4.0
OPMT 510 Business Mathematics.....	4.0
Level 2	
ADMN 200 Macro Economics.....	3.0
ADMN 342 Human Resource Management.....	3.0
ADMN 385 Business Law.....	3.0
ADMN 410 Management Policy.....	3.0
ADMN 461 Microcomputer Software Applications.....	3.0
COMP 213 Computers and Information Systems.....	4.0
FMGT 619 Financial Management 2.....	4.0
MKTG 102 Introduction to Marketing.....	3.0



Faculty and Staff

T.P. Juzkow, B.A.Sc., M.B.A., P.Eng., Program Head
A.G. Liddle, M.B.A.
G. Storey, B.A., M. Sc.
R.A. Yates, LL.B., M.B.A.

Course Descriptions

ADMN 100 Micro Economics — The major areas studied are the product and resource market. Students analyze supply and demand, how production costs vary and how prices are determined in various market structures. In addition, resource allocation and economic policy implications are explored.

ADMN 200 Macro Economics — Develops and understanding of the organization and operation of the Canadian Economy in an International setting. The theoretical tools of the economist are used to expound the concepts of national income employment, inflation, money and banking international trade, and growth. An appreciation of the relationship between economic theory and economic policy is provided. Prerequisite: ADMN 100.

ADMN 310 Management Science — Emphasizes the use of decision-making models in business. It is designed to train students in the use of quantitative methods in the choice of alternatives in the decision-making process. Microcomputers will be used to solve problems.

ADMN 342 Human Resource Management — An introduction to the major personnel and industrial relations programs applicable to the British Columbia workplace with emphasis on the

value of the worker and the overall effectiveness of modern human resource management. It develops understanding of the skills required for selection interviews, performance appraisals, compensation reviews, labor contract negotiations, training and development programs, grievance and collective agreement administration and reviews relevant employment law.

ADMN 361 Microcomputer Software Systems — An introduction to the use of applications software on the microcomputer. Topics include word processing, business graphics, spreadsheets, and databases on one or more operating systems.

ADMN 385 Business Law — A one-term, condensed course which acquaints the business student with a basic knowledge of Canadian law including the legal system, contracts, torts, sale of goods and consumer protection, secured transactions and creditors' remedies, employment law and agency, business organizations, negotiable instruments, real estate and administrative law.

ADMN 410 Management Policy — An analysis of business policy formulation designed to give the student practice, experience and confidence in handling business situations, including those of a complex nature where basic policy decisions are necessary to assist in problem solving. Comprehensive business cases will be selected covering such fields as finance, control, personnel, production, marketing and general management, for study and discussion. The course is designed to acquaint the student with the role of top management and the interrelationships between these fields. Prerequisite: All level 5 courses or permission of the instructor.

ADMN 461 Microcomputer Software Applications — A continuation of Microcomputer Software Systems, with emphasis on the solution of practical problems. Students will become familiar with word processing, data base and spread sheet programs on the IBM-PC system. Familiarity with the programs is developed enabling students to use them in other course areas. Prerequisite: ADMN 361.

ADMN 620 Organizational Behavior — The study of factors that either influence or are influenced by people at work. The course will focus on macro factors such as organizational structure, technology and environment; group factors such as conflict and decisions making; and micro or individual factors such as attitudes, perception and motivation.

BCOM 501 Advanced Business Communication — As future managers, students learn to retrieve, extract and report information efficiently. Building on skills acquired in previous Communication courses, this course emphasizes improving persuasive writing and speaking skills, especially proposal writing.

COMP 213 Computers and Information Systems — Basic data processing principles; flow charting, analysing information requirements, report analysis and design. Computer hardware and software; main frames, minis, micros and peripheral devices. Operating systems hardware and software requirements for various operations. Basic programming for those students with no previous experience.

FMGT 519 Financial Management 1 — Basic accounting procedures; closing the books; adjustments; working papers; merchandise operations; statement and ledger organization; special journals; forms of business organization; accounting principles; introduction to cost accounting; analysis of financial data; working capital; departmental and branch operations; consolidations.

FMGT 619 Financial Management 2 — see FMGT 519. Prerequisite: FMGT 519.

MKTG 102 Introduction to Marketing — An introduction to the marketing environment and marketing institutions. Detailed study of the basic marketing functions, marketing research, product planning, selection of trade channels, merchandising, advertising, sales promotion and salesmanship. Embraces marketing of consumer goods, as well as industrial goods.

OPMT 510 Business Mathematics — Review of basic mathematics applicable to business and industry; mathematics of finance, including retail operations, simple and compound interest, discounts, annuities, financial papers and depreciation methods. Emphasis is on practical applications to business administration.

Human Resource Management Systems

Post Diploma Program

Following some experience in the workforce, Engineering and Health technology graduates or university graduates may be about to assume supervisory and management responsibilities. In many cases this will involve specific responsibility for industrial relations or other aspects of human resource management. Some of these graduates may wish to qualify for a career in human resource management. To meet these requirements, a full-time Diploma Program has been developed.

The Program

The program consists of 9 months study with an emphasis on personnel administration and labor relations; it also includes general management subject areas. Students are required to carry a full course load each term. Depending on previous courses taken, a student may be asked to substitute other courses for some of those shown below. Lectures are supplemented by case studies and group discussions throughout the program.

Prerequisite

Diploma of Technology in Health or Engineering, or university graduation. Prerequisites for certain courses are indicated in the course description for this program. Completion of all Level 3 courses is required before enrolling in Level 4 courses, except where permission is granted by the Department Head.

Applicants should be interested in human resources management. Previous business experience is desirable but not mandatory.

Faculty and Staff

B. van der Woerd, B.A., Program Head
D. Davis, B.A., M.A., LL.B.
R.W. Hooker, B.A., B.Sc., M.A., LL.B., Senior Instructor
L. Jones, B.Sc., M.B.A.
T.P. Juzkow, B.A.Sc., M.B.A., PEng.
A.G. Liddle, M.B.A.
G. Storey, B.A., M.Sc.
N.E. Stromgren, C.D., B.A., M.Ed.(Admin.)
R.A. Yates, LL.B., M.B.A.

PROGRAM: Human Resource Management Systems

	Clim hrs/wk
Level 1	
ADMN 100 Microeconomics	3.0
ADMN 310 Management Science.....	3.0
ADMN 321 Interpersonal Skills Development	2.0
ADMN 330 Industrial Relations	4.0
ADMN 340 Personnel Administration	3.0
ADMN 341 Human Resource Planning and Analysis..	4.0
ADMN 360 Microcomputer Software Systems	3.0
FMGT 519 Financial Management	4.0
Level 2	
ADMN 200 Macro Economics	3.0
ADMN 385 Business Law	4.0



ADMN 410 Management Policy	3.0
ADMN 430 Collective Bargaining	3.0
ADMN 440 Personnel Management Systems	4.0
ADMN 441 Interviewing skills	*4.0
ADMN 442 Training and Development	*4.0
ADMN 490 Directed Studies	6.0
FMGT 619 Financial Management	4.0

Course Descriptions

ADMN 100 Micro Economics — The major areas studied are the product and resource market. Students analyze supply and demand, how production costs vary and how prices are determined in various market structures. In addition, resource allocation and economic policy implications are explored.

ADMN 200 Macro Economics — Develops an understanding of the organization and operation of the Canadian Economy in an International setting. The theoretical tools of the economist are used to expand the concepts of national income employment, inflation, money and banking international trade, and growth. An appreciation of the relationship between economic theory and economic policy is provided. Prerequisite: ADMN 100 or equivalent.

ADMN 310 Management Science — Emphasizes the use of decision-making models in business. It is designed to train students in the use of quantitative methods in the choice of alternatives in the decision-making process. Prerequisite: OPMT 110, OPMT 130 or equivalent.

ADMN 321 Interpersonal Skills Development — This lab concentrates on the development of skills for personnel problem solving. It emphasizes role-play training with students in advisory capacities, helping management and employees to resolve human resource management problems. Prerequisite: ADMN 222 or equivalent.

ADMN 330 Industrial Relations — A detailed analysis of selected labor/management problem areas with emphasis on the solution of practical existing problems in industrial relations.

ADMN 340 Personnel Administration — An introduction to the fundamentals of personnel management, including organization of the personnel function, salary administration, fringe benefits, training, management development and performance appraisal, constructive discipline, grievances and morale. Prerequisite: ADMN 222 or equivalent.

ADMN 341 Human Resource Planning and Analysis — An introduction to the skills and concepts associated with employee data collection and analysis for strategic and human resource planning purposes. Employment planning models, job analysis techniques and statistical methods of measurement are addressed.

ADMN 360 Microcomputer Software Systems — Instruction and practise with commercially advanced microcomputer software systems. Topics currently include integrated programs, exposure to the Macintosh and MS-DOS environments, and databases. Prerequisite: ADMN 190 or equivalent.

ADMN 385 Business Law — A one-term, condensed course which acquaints the business student with a basic knowledge of Canadian law including the legal system, contracts, torts, sale of goods and consumer protection, secured transactions and creditors' remedies, employment law and agency, business organizations, negotiable instruments, real estate and administrative law.

ADMN 410 Management Policy — An analysis of business policy formulation designed to give the student practice, experience and confidence in handling business situations, including those of a complex nature where basic policy decisions are necessary to assist in problem solving. Comprehensive business cases will be selected covering such fields as finance, control, personnel, production, marketing and general management, for study and discussion. The course is designed to acquaint the student with the role of top management and the interrelationships between these fields. Prerequisite: All Level 3 courses.

ADMN 430 Collective Bargaining — An introductory analysis of the fundamental issues and facts of labor-management relations. Special emphasis is given to collective agreement content and interpretation, bargaining and basic labor economics. Prerequisite: ADMN 330 or equivalent.

ADMN 440 Personnel Management Systems — Develops competence in several key personnel practitioner areas, including job evaluation techniques, wage and salary administration functions, and performance appraisal techniques. Two hours a week of microcomputer applications laboratory time are included, for preparation of course assignments that use microcomputer application. Prerequisite: ADMN 340 or equivalent.

ADMN 441 Interviewing Skills — A skills development course emphasizing the interpersonal skills necessary for successful selection interviews. Training techniques include role-playing, individual counselling and feedback. Prerequisite: ADMN 321 and 340; or equivalent.

ADMN 442 Training and Development — Develops ability to design and implement a training program with emphasis on practical problems of training in industry. Prerequisite: ADMN 321 and 340; or equivalent.

ADMN 490 Directed Studies — Designed to give students some practical application of concepts learned in major program areas by engaging in problem-solving projects in business or government. Prerequisite: All Level 3 courses, or permission of the Department Head.

FMGT 519 Financial Management 1 — Basic accounting procedures; closing the books; adjustments; working papers; merchandise operations; statement and ledger organization; special journals; forms of business organization; accounting principles; introduction to cost accounting; analysis of financial data; working capital, departmental and branch operations; consolidations.

FMGT 619 Financial Management 2 — See FMGT 519. Prerequisite: FMGT 519 or equivalent.

Broadcast Communications Technology

The Broadcast Communications program was initiated through the combined efforts of the private sector of the industry and the Canadian Broadcasting Corporation in this province. The need for trained personnel continues to grow in broadcast journalism, radio and television production, and related areas. Those interested in entering fields other than mass communications through broadcasting, i.e. audio and video production, public relations or cablecasting, will find much of the basic technical background included.

The educational emphasis is upon versatility so that a graduate may find employment in a variety of occupations within the broadcast industry. Students will enrol in one of the three options: Radio, Television or Broadcast Journalism.

Job Opportunities

Graduates are employed throughout British Columbia and in all parts of the world, wherever radio, television, cable facilities or audio and video production operations exist.

The Program

Radio

A detailed background is provided in AM and FM radio. Detailed instruction is given in announcing, on-air work, commercial copywriting and production, as well as other areas of radio operations, including sales and management. Students also receive as much practical experience as can be given in the time available, via structured operational simulations in first year, and operation of the campus radio station, CFML, in second year.

Television

This option concentrates on the production tools and operational methods of a modern television broadcast station, cable facility or video production house. Full use of color, and experience in producing all types of modern television productions is provided so that students may work their way through a variety of positions in television and video operations.

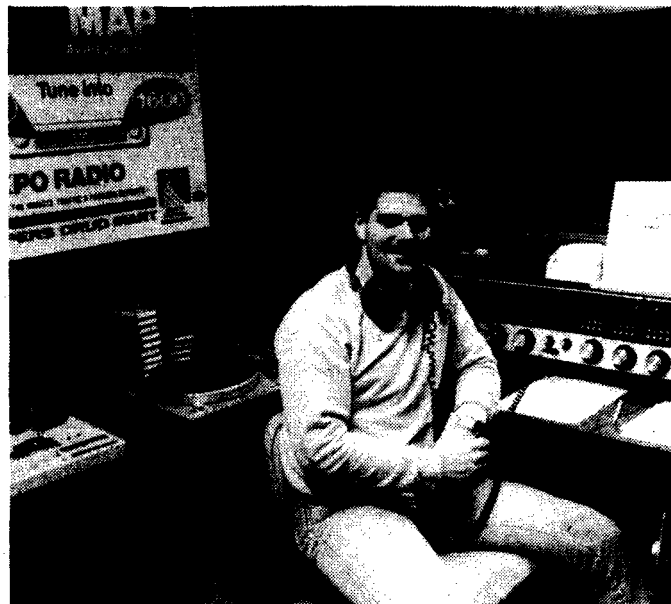
Broadcast Journalism

This option prepares students for careers as news reporters, newscasters and editors in radio and television. Training includes basic news broadcasting skills and academic courses. Skills such as news writing, audio and video editing, and announcing are combined with substantial knowledge of politics, economics, and other topics. Actual newsroom and field reporting operations give the student experience in skill development and judgment.

General Information

Applicants must pass audition and aptitude tests, where applicable, and **must be able to type 25 correct words per minute** to qualify for entrance into the technology. Normally only qualified applicants will be interviewed.

In each of the options students are graded against industry and professional standards and must achieve such standards within their period of study.



Prerequisites

Graduation from senior secondary school is a general prerequisite. Only a limited number of students can be accepted each year and applicants should apply early. Information meetings are held on the last Monday of August and the first Monday of each month during the school year (September — June) at 1730 in room 129, just off the north foyer in building 1A. Where the first Monday of a month is a holiday, the meeting is held on the second Monday. If on-campus interviews are not possible, please write to the Department Head and an interview in the field may be arranged. In making application, full details on related experience and extracurricular courses or aptitudes should be included. Prior to final acceptance, all qualified applicants are given formal interviews and are dealt with individually. No waiting list is established.

The prospective student is expected to have a thorough knowledge of English. Previous studies in the areas of political science, history and other humanities as well as current events, will also prove of value. **Note:** All applicants must submit a short essay (approximately 500 words) detailing their reasons for choosing broadcasting as a career. This essay must accompany the application, with all pertinent documents, letters of reference and recommendations, transcripts, etc.

Faculty and Staff

B. Antonson, Dipl. T., Department Head (Acting)
J.W. Ansell, Dipl. T., Program Head (Radio)(Acting)
H. Dorfman, B.A., on leave
T. Handel, Dipl. T., Dipl. Adult Ed., Program Head, (Television)
B. Ireland
J.R. Jonasson
J.J. Kemp
R. Leipert
G. MacDonald, B.A.
K.J. Mitchell
P. Munoz (on leave)
R.H.B. Nason, B.A., M.P.S.
B. O'Neill, Senior Maintenance Engineer
M.K. Purkis, Dipl. T.
R. Riskin, Dipl. T.
D.W. Short
R. Taylor
J. Yount, Program Head, Broadcast Journalism

TECHNOLOGY: Broadcast PROGRAM: Radio

Level 1		Clim hrs/wk
ADMN 320	Interpersonal Relationships	3.0
BCOM 101	Communication for Broadcasters	3.0
BCST 100	Industry Organization	2.0
BCST 101	Technical Introduction	3.0
BCST 103	Copywriting	3.0
BCST 110	Radio Operations	9.0
BCST 111	Radio Announcing	6.0
BCST 112	Awareness	2.0
BCST 113	Introduction to Broadcast Journalism	2.0

Level 2		
ADMN 381	Broadcast Law	3.0
BCOM 201	Communication for Broadcasters	3.0
BCST 200	Industry Organization	2.0
BCST 203	Copywriting	3.0
BCST 209	Practicum	35.0
BCST 210	Radio Operations	9.0
BCST 211	Radio Announcing	6.0
BCST 212	Awareness	2.0
COMP 112	Computers in Broadcast	3.0

Level 3		
BCOM 301	Communication for Broadcasters	3.0
BCST 310	Radio Operations	14.0
BCST 311	Radio Management	14.0
OPMT 319	Statistics for Broadcasters	3.0

Level 4		
ADMN 101	Economic Issues	3.0
BCOM 401	Communication for Broadcasters	3.0
BCST 409	Practicum	35.0
BCST 410	Radio Operations	14.0
BCST 411	Radio Management	14.0

TECHNOLOGY: Broadcast PROGRAM: Television

Level 1		
ADMN 101	Economic Issues	3.0
ADMN 320	Interpersonal Relationships	3.0
BCOM 101	Communication for Broadcasters	3.0
BCST 100	Industry Organization	2.0
BCST 101	Technical Introduction	3.0
BCST 103	Copywriting	3.0
BCST 120	Television Introduction	11.0
BCST 121	Visual Fundamentals for Television	2.0

Level 2		
ADMN 381	Broadcast Law	3.0
BCOM 201	Communication for Broadcasters	3.0
BCST 200	Industry Organization	2.0
BCST 203	Copywriting	3.0
BCST 209	Practicum	35.0
BCST 220	Television Introduction	20.0
BCST 221	Visual Fundamentals for Television	2.0
BCST 222	Theory of Color Television Systems	3.0
BCST 223	Television Production Planning	3.0

Level 3		
BCOM 301	Communication for Broadcasters	3.0
BCST 320	Television Production	20.0
BCST 321	Television Production Theory	2.0
BCST 322	Television News	4.0
BCST 324	Corporate and Instructional Video Production	4.0
COMP 112	Computers in Broadcasting	3.0

Level 4		Clim hrs/wk
BCOM 401	Communication for Broadcasters	3.0
BCST 409	Practicum	35.0
BCST 420	Television Production	20.0
BCST 421	Television Theory	2.0
BCST 422	Television News	4.0
BCST 424	Corporate and Instructional Video Production	8.0
MKTG 100	Marketing 1	3.0

TECHNOLOGY: Broadcast PROGRAM: Broadcast Journalism

Level 1		
ADMN 101	Economic Issues	3.0
BCOM 101	Communication for Broadcasters	3.0
BCST 130	Introduction to News Reporting	2.0
BCST 131	Introduction to Announcing	3.0
BCST 132	Introduction to Radio	2.0
BCST 133	Introduction to Television	2.0
BCST 134	News Writing	4.0
BCST 135	Municipal Government	2.0
BCST 136	Visual Fundamentals for Journalism	4.0

Level 2		
BCOM 201	Communication for Broadcasters	3.0
BCST 209	Practicum	35.0
BCST 230	News Reporting	2.0
BCST 231	News Announcing	3.0
BCST 232	Radio News	6.0
BCST 233	Television News	4.0
BCST 235	Government and Politics	4.0
COMP 112	Computers in Broadcasting	3.0

Level 3		
BCST 330	Investigative Reporting	2.0
BCST 331	Media Law	2.0
BCST 332	Radio News	10.0
BCST 333	Television News	10.0
BCST 335	History and Social Issues	2.0

Level 4		
BCST 409	Practicum	35.0
BCST 430	Documentaries and Advanced Television News Production	2.0
BCST 431	Labor and Business	2.0
BCST 432	Radio News	10.0
BCST 433	Television News	10.0
BCST 437	Industry Preparation	4.0

Course Descriptions

ADMN 101 Economic Issues — The intent of this course is to expose students to the application of various economic principles to the study of particular problems. Topics vary depending upon the instructor and the technology receiving the course.

ADMN 320 Interpersonal Relationships — Broadcasting involves unusually close interaction among its participants, who work together to provide information, entertainment and station revenues. The course explores the importance of harmonious relationships and how to achieve them.

ADMN 381 Broadcast Law — An introduction to the Canadian legal system emphasizing contracts, torts (including defamation and privacy), criminal law, court procedure and contempt, secured transactions, government agencies, employment law, forms of doing business and negotiable instruments.

BCOM 101 Communication for Broadcasters — Through lectures, labs and industry examples, this course examines some of the basic differences between writing for print and writing for the ear. Students completing this course should be able to apply some of these principles to a variety of standard broadcast features such as reviews, profiles, etc., written in clear, concise and correct language.

BCOM 201 Communication for Broadcasters — A continuation of BCOM 101, this segment of the course will apply the principles of television writing. Students will work individually and in groups to produce a number of presentations and scripts including a documentary feature. Prerequisite: BCOM 101.

BCOM 301 Communication for Broadcasters — Emphasis is on the writing and research skills needed by professionals in broadcasting. Writing skills will be developed through writing scripts for reviews and critiques, writing powerful business letters and memos and developing effective program and story ideas. Research skills will be developed through units on speed reading, time management and advanced research techniques.

BCOM 401 Business Communication for Broadcasters — Emphasis is on skills needed to sell writing to broadcasters and to sell students' abilities and training to employers. Skills will be developed through units on covering letters, resumes and job interview techniques; copyright law; writing effective proposals, queries and sales presentations, and translating students' work into several media. Students will be required to produce broadcast material written to professional industry standards.

BCST 100 Industry Organization — Introduction to the development of the Canadian Broadcasting System, policies and institutions from their beginnings, through their evolution to contemporary standards and practices. The aim is to achieve a better understanding of today's broadcast industry through an historical perspective and scrutiny. Areas of discussion include regulations, associations, political considerations, ratings systems, music licensing, broadcast history, regulatory bodies, etc.

BCST 101 Technical Introduction — Students are introduced to the fundamentals of electricity, magnetism, light and sound. These principles are then used to explain the technical operation of equipment used in the broadcasting industry.

BCST 103 Copywriting — Familiarizes students with advertising techniques, particularly in the broadcast media. Lectures and workshop sessions relate to the writing and evaluation of radio and television commercials. Basic marketing concepts, the function of advertising in society and the economics of broadcast are related. Commercials are studied in detail. Special emphasis is placed on developing the student's ability to work within a group situation. While students may not become writers, the course could lead to a position in copywriting, broadcast sales or promotion.

BCST 110 Radio Operations — An introduction to the equipment and techniques used in radio broadcasting. Starting with station organization, the student continues with a study of microphones, radio control boards, tape machines and broadcast accessories, and develops the manual dexterity needed in the operation of this equipment.

BCST 111 Radio Announcing — An introduction to effective oral communication for radio using lectures, exercises and practical application of the techniques of the various specialized forms taught. Individual and classroom critiques are employed and auditions and assignments measure progress. Broadcast regulations and program scheduling are also included in the announcer-related areas of practical responsibilities.

BCST 112 Awareness — It is essential that a broadcaster be credible to the listener by exhibiting concerns and interests close to the individual and the community. As broad a base of external knowledge as possible must be acquired reflecting the local, regional, national and international scene. Lectures and practical exercises assist in acquiring and building the knowledge base and using it effectively.

BCST 113 Introduction to Broadcast Journalism — Introduces the radio student to the basic fundamentals and principles of news broadcasting. The course will instruct students in the gathering, handling, and dissemination of news and sports information and will make them more aware of the importance of information programming in the broadcast industry.

BCST 120 Television Introduction — Understand the basic components of a television production and how each interrelates with the others. Equipment explanations include cameras, switchers, audio equipment, video tape recording, and EFP/ENG usage. Manual dexterity is developed in the operation of studio and control room production equipment. The course is divided into approximately 8 hours lab (orientation/practical) and 3 hours lecture. This may fluctuate from time-to-time.

BCST 121 Visual Fundamentals for Television — Covers the fundamentals of picture taking, including the practical aspects of focus, lighting, etc., and creative aspects — how to tell stories with pictures. The course provides the conceptual base for later work in electronic news gathering (ENG) techniques.

BCST 130 Introduction to News Reporting — Introduces the student to the basic principles of radio and television news gathering and dissemination. The course will give the student a grounding in the systems, issues, and policies of the broadcast news industry and will prepare the student for the more detailed and involved aspects of the succeeding news course.

BCST 131 Introduction to Announcing -The student is introduced to basic concepts of voice use, announcing techniques and news reading skills. Stress is placed on daily practice and students receive both individual and group coaching.

BCST 132 Introduction to Radio — Broadcast journalism and engineering students are introduced to radio broadcast equipment and production techniques. The course is designed to give the student a basic appreciation and understanding of the operational side of radio broadcasting. Much practical work complements classroom instruction.

BCST 133 Introduction to Television — Introduces broadcast journalism students to television educational techniques, preparing for future work in this industry by providing an understanding of television operations that occur while they are "on camera".

BCST 134 News Writing — Trains and prepares students to write radio and television news copy. Two hours per week are devoted to lecture and basic writing theory. Two hours are directed at "in-class" writing and re-writing practice for both media. The course relies heavily on "in-class" practice and critique. Occasionally, students will take part in critiques of their own work, and that of others. Guest lecturers from within the broadcast industry are utilized from time-to-time.

BCST 135 Municipal Government — This course follows a lecture format, with practical assignments, and covers the fundamental operations, structures and problems of local government in B.C. The focus is related directly to news reporting work.

BCST 136 Visual Fundamentals for Journalism— Students examine the language of pictures and their use to convey infor-

mation. Topics include the history of pictorial communications, social context, the relationship between picture making technologies, picture communications and picture use in television news. The course objective is conceptual stimulation rather than "button pushing". While some familiarity with 35mm. photography is assumed, there are ample opportunities to learn "the basics".

BCST 200 Industry Organization — Building on the understanding of Canadian broadcasting developed in BCST 100, this course closely examines the broadcast policies, institutions, and regulations that affect both private and public sectors of the Canadian Broadcast system. Prerequisite: BCST 100.

BCST 203 Copywriting — see BCST 103. Prerequisite: BCST 103.

BCST 209 Practicum — This is a four week practical exercise to end first term. Radio and journalism students will operate radio station CFML twenty-four hours per day during this period, while the television students produce a series of program segments. Television and journalism students will produce television newscasts through the weeks.

BCST 210 Radio Operations — A continuation of BCST 110, the major emphasis for the student will be on honing the technical operations skills learned in term one. Commercial production, radio station operations, audition tapes, and the use of lightweight, portable equipment are topics for instruction in this term. Emphasis is placed on practical applications of theory. Prerequisite: BCST 100.

BCST 211 Radio Announcing — Effective oral communication of ad-lib and written material is strengthened this term, along with timing, up-grading to acceptable on-air standard, and continued classroom drills, exercises and practice. Basis for correct foreign language pronunciation is provided. Operations in conjunction with radio operations labs serve to bring reality to course objectives. Prerequisite: BCST 111.

BCST 212 Awareness — Building on the knowledge base attained in term one seminars, lectures and oral communication exercises further develop even broader areas of specific listener-oriented subjects and concerns, and the application in various broadcast forms. Organization of facts and concise communication delivery form is stressed. Prerequisite: BCST 112.

BCST 220 Television Introduction — Understand the basic components of a television production and how they interrelate. Equipment explanations include cameras, switchers, audio equipment, video tape recording, and EFP/ENG usage. Manual dexterity is developed in the operation of studio and control room production equipment. The course is divided into approximately 8 hours lab (orientation/practical) and 3 hours lecture. This may fluctuate from time-to-time. Prerequisite: BCST 120.

BCST 221 Visual Fundamentals for Television — Designed for TV students, the course concentrates on 35 mm photography in TV stations where the production of slides for news and commercial use is often extensive. Students learn how to take good pictures and to develop and print them.

BCST 222 Theory of Color Television Systems — Begins with the psychophysics of human vision and explains how the eye perceives and adapts to color. This theory is applied to the NTSC system. The color TV signal path from the camera through production and measuring equipment to final display is explained. Prerequisite: BCST 101.

BCST 223 Television Production Planning — Upon successful completion of this course, the student will be able to plan all the

elements necessary to guarantee a production which meets the professional standards of the television production industry, and organize and conduct pre and post production meetings as the producer/director of a proposed series pilot. Prerequisite: BCST 220.

BCST 230 News Reporting — This course gets the student involved in the identification, researching and gathering of news material in an organized manner. The student is introduced to beat and filing systems, the courts, the police, organized labor, business, and politics. Prerequisite: BCST 130.

BCST 231 News Announcing — After initial voice training in term one, the student is now ready for advanced radio and TV news reading. Through additional training and coaching, the student is expected to polish voice skills and become proficient at ad-lib techniques and interviewing. The student must develop proficiency in news presentation for both radio and TV. Prerequisite: BCST 131.

BCST 232 Radio News — This is the first opportunity for students to work in a newsroom environment. The class is divided into small groups for personal instruction on operating newsroom equipment. This is followed by several weeks of practice where students write, compile and read newscasts as well as honing their ability to use newsroom equipment. Prerequisite: BCST 134.

BCST 233 Television News — Students learn the process by which a story idea is transformed into a television news story. They learn to gather visual materials that tell their story, to write a script that works with their visuals, and to edit visuals together with script to create a comprehensible television news story. Some attention is given to newscast make-up and presentation. Prerequisite: BCST 133.

BCST 235 Government and Politics — Since a broadcast journalist is frequently dealing with political issues, this course acquaints the student with the structure of the Canadian Federal and Provincial governments. It also provides the student with an opportunity to research political issues and be involved in interaction with other students on current issues.

BCST 310 Radio Operations — Having gained basic competence in radio broadcast technique, students now apply their knowledge to regular practical work through operation of the campus radio station. All work is done to industry standards and individual and group performance is evaluated and critiqued. In lecture situations, students receive training in station systems and operations, multi-track recording and advanced production techniques. This training is then put into practical use via assignment and the day-to-day operations of the radio station. The course is demanding and stimulating. Prerequisite: BCST 110 or BCST 210 or BCST 111 or BCST 211.

BCST 311 Radio Management — Detailed studies are made in a number of topic areas that affect broadcasters attitudes toward the industry and their abilities to perform within it. These include basic business concepts, announcing skills, overviews on programming variables, the roles of information and music in contemporary programming, statistical measures in broadcasting, career development, broadcast sales and management. Prerequisite: BCST 111 or BCST 211 or BCST 110 or BCST 210.

BCST 320 Television Production — Upon successful completion of this course, students will be able to demonstrate their professional competency as members of a television production team as they rotate through all respective positions. Studio, field and post-production activities will be assigned to meet the production of a variety of program formats. Students will assume

all managerial, production and support function responsibilities. Prerequisite: BCST 120, BCST 220.

BCST 321 Television Production Theory — Upon successful completion of this course, students will be able to organize and conduct a production meeting, provide constructive criticism of their peers performance and accept the same for their own projects, gain an understanding of various aspects of the broadcast industry through contact with professionals, which will provide the basis for oral and written presentations on selected topics. Presentation topics will be assigned by the first week in October.

BCST 322 Television News — This studio activity is assigned to second year television students to provide the routine of airing television newscasts on a weekly basis. Students will be rotated through production crew positions following the Broadcast Journalism rotation schedule. Students are expected to demonstrate professional competence in all crew positions as they "air" TV newscasts. Prerequisite: BCST 221.

BCST 324 Corporate and Instructional Video Production — This studio activity is assigned to second year television students in order to provide them with the opportunity to prove their professional competence as members of the BCIT Television production team for BCIT Knowledge Network productions and other educational video programming. These programs will be either "live" transmissions or pre-taped.

BCST 330 Investigative Reporting — Even though all reporting involves an investigative process, this course prepares the student for specialized reporting in public affairs and consumer research. The student is taught interviewing and research techniques and is expected to complete a major investigative project. Prerequisite: BCST 235.

BCST 331 Media Law — It is important for a broadcaster to be trained to function within the Canadian judicial system. This course explains the inner workings and the various levels of courts and it familiarizes students with Canadian criminal law and the laws of libel and slander. Prerequisite: BCST 232 or BCST 233.

BCST 332 Radio News — Students now begin performing in structured newsroom operations. They are divided into groups to operate the student radio station and the two newsroom labs. Some students are also given off-campus assignments to give them experience as beat reporters at courthouses, city and municipal halls and police headquarters. Students are given frequent individual and class critiques on their performance. Prerequisite: BCST 232.

BCST 333 Television News — Students bring ideas for news stories to class where these ideas are produced to fit the formats of television news. While most of the emphasis will be on ENG production, occasional stories may warrant the use of available studio and graphic facilities. Stories are incorporated into news programs that are produced in conjunction with the television production option. Prerequisite: BCST 233.

BCST 335 History and Social Issues — Students are introduced to concepts from the social sciences — especially group membership, society, culture, ethnicity, alienation and deviance. Topics are related to recent news stories from British Columbia and Canada, and include B.C. history, ethnic groups, Canadian regional economic development, and issues in Canadian society. Class time is divided between lectures, discussions and student presentations.

BCST 409 Practicum — During the last month of the final term, students are located in industry positions to observe, practice,

work and learn in actual industry situations. This "real world" experience complements the training and experience received in the past two years, providing a final preparation for assuming paid positions as a start to their broadcast careers. Prerequisite: All appropriate option courses.

BCST 410 Radio Operations — Using the operation of the campus radio station as a base, students specialize in desired work areas and are fine-tuned in preparation for entering the industry. Much emphasis is placed on preparation for job applications and industry interviews. Under the co-operative education program, eligible students may enter full-time, paid positions in industry while continuing their studies via correspondence assignments. The course concludes in mid-April, at which time students commence practicum assignments. Industry practices and standards prevail throughout the course. Prerequisite: BCST 110, 210, 310.

BCST 411 Radio Management — Considerable time is spent preparing students for their chosen roles in industry. The functioning of the student in day-to-day operations of radio station CFML takes on increasing importance in this final term of formal training. The course examines contemporary station management practices plus current roles and responsibilities surrounding the members of a modern management team. Prerequisite: BCST 111, 211, 311.

BCST 420 Television Production — see BCST 320. Prerequisite: BCST 320.

BCST 421 Television Theory — see BCST 321. Prerequisite: BCST 321.

BCST 422 Television News — see BCST 322. Prerequisite: BCST 322.

BCST 424 Corporate and Instructional Video Production — see BCST 324.

BCST 430 Documentaries and Advanced Television News Production — Research, reading and class discussion on topical subjects are designed to deepen the student's understanding of news-related issues and methods of approaching them. Prerequisite: BCST 330.

BCST 431 Labor and Business — As the student approaches graduation, it is important that he or she have a good understanding of labor unions and the management structure. This course explains the structure of unions as well as the labor laws of BC and Canada. The second part of the course explores the complexities of business, finance and the stock market. Prerequisite: BCST 332 or BCST 333.

BCST 432 Radio News — This is the advanced course in newsroom operations and students continue to practice the skills of reporting, writing and announcing. Students continue to work in the field as well as operating the student radio station and the news labs. The major thrust of this course is to identify student weaknesses and to assist them in strengthening their performance for entry into the industry. Prerequisite: BCST 332.

BCST 433 Television News — This course is a continuation of the third term television news lab. While the format for both courses is the same, the standards of evaluation in the fourth term are raised to reflect the expectations of professional broadcast journalism. Prerequisite: BCST 333.

BCST 437 Industry Preparation — This course is designed to give the student final preparation for graduation and employment. Students prepare a resume and audition package which is distributed to radio and TV stations in western Canada. Part of the course familiarizes students with sales, marketing and

newsroom management. Prerequisite: BCST 331.

COMP 112 Computers in Broadcasting — The computer is an important servant of broadcast communication. Topics include application processing for the radio, journalism and television fields along with general systems analysis and design for the business area of broadcasting including program logs, record library, computer graphics and word processing.

MKTG 100 Marketing 1 — A comprehensive study of the foundations and principles of marketing for those students pursuing a concentrated marketing based program. Covers basic marketing functions, marketing research, product planning; distribution, sales and promotion activities. Examines marketing in relation to all types of consumer, industrial and service firms.

OPMT 319 Statistics for Broadcasters — Examines the elements of descriptive statistics. These comprise techniques for collecting, summarizing and treating data so as to facilitate its use and comprehension. Graphic presentation is emphasized. Forecasting techniques are discussed, as is the construction of basic index numbers, with emphasis on the Canadian Consumer Price Index and its ramifications. The B.B.M. and Nielsen ratings, opinion polling and station rate cards are also covered in detail.



Financial Management Technology

No enterprise can survive without the means for funding and financial control and in modern business the techniques of financial management — financial planning, budget preparation and financial control — have gained increasing importance as management tools. BCIT students may specialize in accounting or finance.

Job Opportunities

Specialists in accounting commonly enter middle management positions in financial accounting, cost accounting, internal audit and budget preparation.

Graduates in finance are placed in a variety of positions — in banks, trust companies, insurance companies and finance companies, as well as in the finance departments of businesses, industries and government. After gaining appropriate experience, finance specialists may rise to the managerial level and beyond.

The Program

Following a year of general studies in business, students will enter one of two options: Accounting or Finance.

The Accounting Option is concerned with management accounting systems, financial reporting and auditing. The second year courses in this option build upon the accounting, data processing and computer systems fundamentals introduced in the first year with increased concentration on financial and cost accounting.

The Finance Option deals with the intricacies of funding business operations. In addition to a thorough grounding in financial accounting, students in this option make an in-depth study of financial decision making in their second year of the Financial Management program.

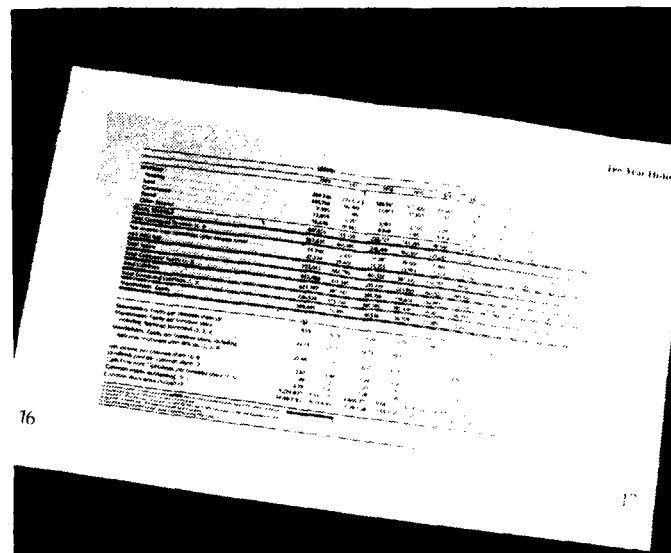
Prerequisites

Algebra 11 and English 12 both with C+ are the course requirements for this program. Applicants must have an inquiring and logical mind, a capacity for hard work, excellent communication skills and the ability to work well with others. Candidates who do not meet this requirement are to include with their application, a letter (with references) outlining their career objectives and reasons for selecting Financial Management to enable the departmental selection committee to consider their application.

Professional Accreditation (See page 257)

The accounting profession, through its professional bodies, recognizes a wide variety of accounting subjects offered in the program. The Canadian Institute of Chartered Accountants, the Canadian Certified General Accountants' Association, the Society of Management Accountants and the Canadian Credit Institute give credit for various subjects.

In addition to the professional bodies, universities will give credit for subjects taken in the program where students wish to continue their training and qualify for a university degree. For example, graduates of the Financial Management Diploma program are eligible to transfer to the Open Learning Institute Bachelor of Arts in Administrative Studies program to continue their studies toward a degree.



Faculty and Staff

G.H. Farrell, Dipl. T., M.B.A., R.I.A., F.S.M.A.C., Department Head
 R.C. Bell, B.A. (Econ.), C.G.A.
 C.M. Briscall, B.Com., M.B.A., R.I.A., F.S.M.A.C., Program Head
 D.K. Chan, B.Comm., M.B.A., C.A.
 A.D. Cobbett, Dipl. T., M.B.A., R.I.A.
 R.A. Cradock, B.Comm., M.B.A., R.I.A., F.S.M.A.C.
 J.R.H. Curtis, B.Com., M.B.A., A.M.B.I.M., Leave of Absence
 R.J. Dolan, B.B.A., M.B.A., Program Head
 J.V. Gibson, R.I.A.
 K.M. Hamm, B.Com., R.I.A., Chief Instructor
 E.M. Iannacone, B.Com., M.B.A., R.I.A., F.S.M.A.C.
 R.W. Jackson, M.C.I.
 J.L. Johnston, Dipl.T., C.G.A.
 H.M.J. Lawson, B.Sc. (Econ.), M.B.A., Leave of Absence
 R.B. McCallum, B.Eng., M.B.A., R.I.A.
 R.G. Murphy, Dipl.T., R.I.A.
 R.C. Nichols, B.Com., R.I.A., Chief Instructor
 J.F. Porteous, R.I.A.
 C. Priester, B.Comm., M.A., F.C.B.A.
 C.J. Trunkfield, B.A., M.B.A., F.C.G.A.
 P.J. Woolley, B.A., M.A., F.C.A.
 H.B. Yackness, B.Com., M.B.A., C.A., Chief Instructor

TECHNOLOGY: Financial Management

		Clrm hrs/wk
Level 1		
ADMN 100	Micro Economics.....	3.0
ADMN 110	Management 1.....	3.0
BCOM 104	Business Communication for Financial Management	3.0
COMP 100	Introduction to Data Processing.....	4.0
FMGT 101	Accounting 1	4.0
MKTG 102	Introduction to Marketing	3.0
OPMT 112	Business Mathematics.....	4.0
Level 2		
ADMN 200	Macro Economics.....	3.0
ADMN 211	Management 2 (Term B).....	3.0
ADMN 222	Organizational Behavior (Term A)	3.0
BCOM 204	Business Communication for Financial Management	3.0
COMP 120	Computers in Business.....	3.0

	Cirm hrs/wk
FMGT 106 Credit and Collections	3.0
FMGT 201 Accounting 2	4.0
FMGT 291 Financial Reports (Term B)	2.0
FMGT 292 Computerized Accounting (Term A)	2.0
OPMT 132 Statistics for Financial Management	4.0

PROGRAM: Accounting

Level 3

ADMN 385 Business Law	4.0
FMGT 301 Cost and Managerial Accounting 1	4.0
FMGT 302 Financial Accounting 1	5.0
FMGT 307 Finance 1	4.0
FMGT 310 Auditing 1	3.0
FMGT 313 Taxation 1	3.0
FMGT 318 Microcomputer Systems	4.0

Level 4

FMGT 401 Cost and Managerial Accounting 2	4.0
FMGT 402 Financial Accounting 2	5.0
FMGT 404 Finance 2	4.0
FMGT 406 Auditing 2	4.0
FMGT 407 Microcomputer Applications	4.0
FMGT 409 Taxation 2	3.0
FMGT 411 Projects in Industry (Term B)	*4.0
FMGT 412 Security Fundamentals (Term A)	*4.0
FMGT 413 Business Strategies (Term B)	*4.0
FMGT 415 Advanced Accounting	*4.0

* Students may be permitted to take FMGT 411 and 412 OR FMGT 412 and 413 OR FMGT 415.

PROGRAM: Finance

Level 3

ADMN 385 Business Law	4.0
FMGT 301 Cost and Managerial Accounting 1	4.0
FMGT 302 Financial Accounting 1	5.0
FMGT 307 Finance 1	4.0
FMGT 308 Security Analysis 1	4.0
FMGT 313 Taxation 1	3.0
FMGT 318 Microcomputer Systems	4.0
FMGT 331 Money and Banking 1	4.0

Level 4

FMGT 401 Cost and Managerial Accounting 2	4.0
FMGT 402 Financial Accounting 2	5.0
FMGT 404 Finance 2	4.0
FMGT 405 Security Analysis 2 (Term A)	4.0
FMGT 407 Microcomputer Applications	4.0
FMGT 409 Taxation 2	3.0
FMGT 411 Projects in Industry (Term A)	*4.0
FMGT 413 Business Strategies (Term A)	*4.0
FMGT 414 Advanced Finance (Term B)	4.0
FMGT 430 Money and Banking	4.0

* Students may be permitted to take FMGT 411 OR FMGT 413.

TECHNOLOGY: Financial Management — January intake

Level 1

ADMN 100 Micro Economics	3.0
ADMN 112 Management 1L	3.0
BCOM 108 Business Communication	3.0
COMP 106 Introduction to Data Processing 1L	4.0
FMGT 106 Credit and Collections	3.0

	Cirm hrs/wk
FMGT 115 Accounting 1L	4.0
MKTG 102 Introduction to Marketing	3.0
OPMT 112 Business Mathematics	4.0

Level 2

ADMN 200 Macro Economics	3.0
ADMN 220 Organizational Behavior	3.0
BCOM 208 Business Communication	3.0
COMP 125 Computers in Business	3.0
FMGT 215 Accounting 2S	4.0
FMGT 291 Financial Reports (half term course)	2.0
FMGT 292 Computerized Accounting (half term course)	2.0
OPMT 112 Business Mathematics	4.0

Course Descriptions

ADMN 100 Micro Economics — The major areas studied are the product and resource market. Students analyze supply and demand, how production costs vary and how prices are determined in various market structures. In addition, resource allocation and economic policy implications are explored.

ADMN 110 Management 1 — An orientation to the nature of business in the private enterprise system, embracing forms of business ownership, production, management principles and techniques, as well as the functions of planning, organizing and staffing. Students are given an opportunity to develop their analytical skills by analysing, deliberating upon and proposing solutions to typical case problems.

ADMN 200 Macro Economics — Develops an understanding of the organization and operation of the Canadian economy in an international setting. The theoretical tools of the economist are used to expand the concepts of national income employment, inflation, money and banking, international trade and growth. An appreciation of the relationship between economic theory and economic policy is provided.

ADMN 211 Management 2 — Follows on from Management 1 to give further insight into the functions and practice of management. Areas covered include the main functions of directing, controlling, and strategic planning, as well as decision making and a brief introduction to industrial relations. The student will be expected to create a business plan as part of this course.

ADMN 222 Organizational Behavior — The study of the main factors that either influence or are influenced by people at work. The course will focus first on micro or individual factors such as values, attitudes, perception and motivation. This is followed by a look at such macro or group factors as leadership, communication, supervision, power, conflict and change.

ADMN 385 Business Law — A one-term, condensed course which acquaints the business student with a basic knowledge of Canadian law including the legal system, contracts, torts, sale of goods and consumer protection, secured transactions and creditors' remedies, employment law and agency, business organizations, negotiable instruments, real estate and administrative law.

BCOM 104 Business Communication for Financial Management — Prepares students to meet the business communication demands of financial management positions. They learn to plan, organize and write effective business letters and memos. They will also prepare and present oral reports.

BCOM 108/208 Business Communication — January Intake for Financial Management — This course covers the topics from BCOM 104/204 but in a different sequence.

BCOM 204 Business Communication for Financial Management — Gives further instruction and practice in the principles taught in BCOM 104. In this term, instruction will concentrate on how to write short and long reports, prepare more complex oral presentations and conduct meetings and interviews. Prerequisite: BCOM 104.

COMP 100 Data Processing — Introduction — Training in basic data processing principles to develop recognition of the application of these principles to industry. The principal functions of data processing are illustrated and practised with an H.P. minicomputer operating interactively. Elementary computer programs are written and tested on the computer. Use of flow-charting and elementary data processing systems design will illustrate the achieving of data processing objectives.

COMP 106 Introduction to Data Processing — This course combines all of the topics included in COMP 100 together with the business systems analysis topics from COMP 120. (The remaining topics from COMP 120 are covered in COMP 125.)

COMP 120 Computers in Business — Designed to give the student an understanding of business computer systems. Topics include computer hardware — types, usage, evaluation; systems development — feasibility studies, analysis, design, implementation; packaged software — use and evaluation. Emphasis will be placed on particular areas of interest to the specific technologies.

COMP 125 Computers in Business — The follow-up course to COMP 106. Topics from COMP 120 which were not covered in COMP 106 will be covered in this course.

FMGT 101 Accounting 1 — Permits persons with little or no accounting background to become familiar with the techniques of working through the full accounting cycle. The course provides theoretical and practical training in basic accounting as preparation for FMGT 201. Topics include an introduction to accounting theory; income measurement; traditional record-keeping procedures; the accounting cycle; special journals; cash; merchandising operations; inventory estimation and costing.

FMGT 106 Credit and Collections — A detailed examination of credit granting, collection techniques and credit philosophy in all levels of business prepares the student to assist the credit manager of a large or small business in any area of the subject. Topics include determining consumer credit risk; credit instruments and collateral security; types of consumer credit and credit cards; sources of consumer credit information; collections; credit department management. Mercantile credit management includes: risk analysis; sources of information; terms of sale and credit limits; collections; management; financial statement analysis; accounting for receivables; credit legislation.

FMGT 115 Accounting 1L — Enables students to start the basic course in accounting in January. It is the equivalent of FMGT 101 and the first six weeks of FMGT 201 for a total of 18 weeks of the 30 week presentation. The balance of the course may be taken in either May or September FMGT 215. For a description of the course content see FMGT 101/201.

FMGT 201 Accounting 2 — The follow-up to FMGT 201, topics include notes and accounts receivable, long-lived assets, liabilities, partnerships and corporations, cash-flow and working capital analysis, manufacturing accounting, management accounting, consolidated statements and analysis of financial statements. Prerequisite: FMGT 101.

FMGT 215 Accounting 2S — Follow-up course to FMGT 115, enabling students to complete the last 12 weeks of the basic accounting course. See FMGT 201 for details. Prerequisite: FMGT 115.

FMGT 291 Financial Reports — The purpose of this course is to provide Financial Management students with skills in formal reporting. They will have the opportunity to analyze an organization first hand, talk to key personnel and investigate that firm's financial and organizational make-up. Operating as part of a small syndicate, students will make a formal oral presentation to a large group in a theatre setting using audio/visual techniques and equipment. Corequisite: FMGT 106.

FMGT 292 Computerized Accounting — Enables the student with an introductory financial accounting background to utilize this knowledge in a computerized setting. Students progress through a microcomputer accounting package that will provide them with the flexibility to adapt to many accounting packages that are currently available in the market place. The emphasis of this course is to upgrade the ability to handle modern accounting software packages on the microcomputer. Prerequisite: FMGT 101 or 115.

FMGT 301 Cost and Managerial Accounting 1 — Emphasizes the role of the management accountant, cost concepts and terminology, cost flows, cost allocation, job and process costing, service departments and joint products. Prerequisite: FMGT 201 or 215.

FMGT 302 Financial Accounting 1 — For students with basic accounting knowledge to broaden their understanding of the accounting process and its underlying theory. This course and FMGT 402 prepare them for career advancement and advanced study in accounting. Topics cover development of financial information for external circulation; the accounting process from a more analytical and judgmental standpoint; the income statement and balance sheet; cost, valuation, presentation and income measurement problems associated with current assets and current liabilities. Prerequisite: FMGT 201 or 215.

FMGT 307 Finance 1 — The two major aims of corporate finance are (1) the efficient allocation of funds within the enterprise and (2) the raising of funds on as favorable terms as possible. This course focuses on the following topics related to these overall aims: corporate organization and taxation, allocation of funds through financial markets, valuation of financial instrument, financial statement analysis and working capital management. Prerequisite: FMGT 201 or 215.

FMGT 308 Security Analysis 1 — This is an introductory level course in investments. The first part examines the impact of economic activity on financial assets and provides a macroeconomic framework for an understanding of the interaction of these markets. The second portion deals with investing in common stock with particular attention paid to their nature, analysis and valuation. Prerequisite: FMGT 201 or 215.

FMGT 310 Auditing 1 — Discusses auditing principles, specific techniques in analytical auditing and some asset classifications. Students study the meaning and purpose of the audit function and are introduced to techniques and procedures. Topics include history, professional ethics, internal control, auditing EDP systems, gathering evidence, audit work papers. Prerequisite: FMGT 201 or 215.

FMGT 313 Taxation 1 — Introduces individuals with little or no income tax knowledge to the basics of Canadian income tax. The course constitutes the first half of taxation with FMGT 409 completing it. Topics include tax information sources, residency, classes of taxpayers, employment income, business income,

investment income, capital cost allowance and capital gain rules. Prerequisite: FMGT 201.

FMGT 318 Microcomputer Systems — Students will receive instruction and practice in the use of commercially available microcomputer software systems and will use these systems to solve business problems. Typical programs will involve word processing, electronic worksheets, data base management and business graphics. Prerequisite: COMP 120 or 125.

FMGT 401 Cost and Managerial Accounting 2 — Emphasizes budgeting and control, standard costs and variances, variable costing, cost estimation cost-volume-profit analysis, differential costs, multiple-product decisions and inventory management. Prerequisite: FMGT 301.

FMGT 402 Financial Accounting 2 — Completes the study of intermediate accounting necessary for employment in more responsible accounting positions. Topics include cost, valuation, presentation, income measurement problems associated with long term assets and liabilities (where appropriate), shareholders' equity accounts, income tax allocation, statement of changes in financial position (cash flow), statements from incomplete data, accounting changes, errors, accounting for leases and price-level changes. Prerequisite: FMGT 302.

FMGT 404 Finance 2 — This course continues where FMGT 307 left off and focuses on: sources of short, medium and long-term financing; capital budgeting techniques (IRR and NPV), determining the cost of capital, financial leverage and capital structure, equity sources of funds, common, preferred, rights, warrants and convertibles, to close with an analysis of mergers and take-overs. Prerequisite: FMGT 307.

FMGT 405 Security Analysis 2 — Techniques and principles of security analysis; valuation of securities; analysis of risks inherent in all types of fixed income investments. Emphasizes the investment setting, the securities market, investment timing and portfolio analysis of both individual and institutional investors. Prerequisite: FMGT 308.

FMGT 406 Auditing 2 — Follow-up to FMGT 310. The student studies general auditing principles and specific audit procedures and learns to critically assess accounting procedures. Topics include auditing assets, liabilities, owner's equity, revenues, cost, expenses, financial statements and audit reports. A short audit case will be undertaken. Prerequisite: FMGT 310.

FMGT 407 Microcomputer Applications — A continuation of FMGT 318 emphasizing the solution of practical problems. It is expected that students will develop a level of familiarity with software programs and applications such that they will use them in their other course areas. Prerequisite: FMGT 318.

FMGT 409 Taxation 2 — Students expand on their study of Canadian income tax begun in FMGT 313 and become aware of the complexities and problem areas involved in tax planning. Topics include tax on individuals (including proprietors and partners), corporations and trusts, corporate surplus distributions, international income, appeal procedures, tax planning and tax avoidance versus tax evasion. Prerequisite: FMGT 313.

FMGT 411 Projects in Industry — To provide experience in the practical application of concepts learned in their program, students work directly on a problem-solving project provided by a company or government agency. Prerequisite: Completion of Term 3.

FMGT 412 Security Fundamentals — An introduction to the fundamentals of investing including market mechanics, the investment setting, technical and fundamental analysis of com-

mon stock, preferred stock and corporate bonds. Prerequisite: FMGT 201 or 215.

FMGT 413 Business Strategies — A business simulation or game which applies the principles and decision-making techniques of the Finance 1 and 2 courses to the operation of a company. Operating within the Canadian tax system and a simulated economic environment, the student will attempt to enhance the value of the firm by means of sound marketing, production, capital budgeting and financing decisions. Prerequisite: FMGT 307; Corequisite: FMGT 404.

FMGT 414 Advanced Finance — Familiarizes the student with the fundamentals of raising funds. Emphasis is placed on various sources of funds with particular focus on the types, their benefits and costs. Topics covered will include bank financing, government funding and venture capital. Prerequisite: FMGT 307.

FMGT 415 Advanced Accounting — The student will review GAAP and objectives of financial reporting as these relate to the main objectives of this course. A closer examination of corporate combinations will be undertaken including consolidations for wholly-owned and non-wholly-owned subsidiaries (both in the year of acquisition and in subsequent years) and pooling of interests. Accounting for foreign currency transactions will also be studied, along with fund accounting and branch operations. Prerequisite: FMGT 302.

FMGT 430 Money and Banking — Examines central banking and monetary control, financial assets and financial markets, objectives and techniques of monetary policy, money and the international economy. Prerequisite: ADMN 100 and 200.

MKTG 102 Introduction to Marketing — Includes a detailed study of the basic marketing functions, marketing research, product planning, selection of trade channels, merchandising, advertising, sales promotion and salesmanship. Marketing of consumer goods as well as industrial goods will also be covered.

OPMT 112 Business Mathematics — Review of basic mathematics applicable to business and industry, consumer and commercial credit. Simple and compound interest, financial instruments and discounting, annuities, mortgages, loans, sinking funds, leases. Depreciation methods, capitalised costs. Cash flow analysis, NPV, IRR. Emphasis is on maximum use of pre-programmed calculator, and practical application from the field of financial management.

OPMT 132 Statistics for Financial Management — Will enable students to acquire skills in summarizing and analyzing data using descriptive and inferential statistical techniques. Topics include graphical presentation of data, measures of location and variation, elementary probability and standard distributions. Elementary sampling theory, estimation and confidence intervals, hypothesis testing, linear regression, correlation, index numbers and time series. Emphasis is on practical applications in the field of Financial Management.

Hospitality and Tourism Administration Technology

Rapid expansion in the hospitality and tourism industry continues, resulting in a high demand for professionally educated staff who are able to plan for future requirements and to adapt to rapidly changing conditions.

Job Opportunities

Hotel, Motel and Food Service graduates are employed in hotels, motels, restaurants, department stores food services, industrial and airline catering firms, and in a wide variety of other organizations involved in food services and housing such as hospitals and universities. Travel and Tourism graduates may find employment in travel agencies, tour agencies, as tour operators, with surface or air transportation companies, or government agencies involved in travel promotion.

The Program

Students enter a common first year heavily oriented to general business management subjects applied, where practical, in a hospitality and tourism industry setting. The balance of the first year program provides introductory courses directly related to the hospitality and tourism field. At the end of first year students will choose to continue in second year in either the Hotel, Motel and Food Service option, or the Travel and Tourism option. However, there may be a limited number of seats in the Travel and Tourism option. Regardless of option selected, each student must complete a 500 hour work practicum in some aspect of the hospitality and tourism industry between date of registration and graduation.

Prerequisites

English 12 and Algebra 11 both with C+ are course requirements for this program. High School graduates who have successfully completed the Career Preparation Program (C.P.P.) in Hospitality and Tourism should so indicate on their BCIT application for possible special consideration.

Applicants should be reasonably familiar with the components and careers available in the hospitality and tourism industry. Preference will be given to applicants with a minimum of 6 months (1,000 hours) of industry-related practical work experience.

Applicants should be good communicators and people-oriented, with a willingness to relate harmoniously and effectively with the public and fellow workers. Upon entering the industry, they should be prepared to work irregular hours.

Informational meetings about the program and career opportunities in the hospitality and tourism fields, may be offered from February through May. Applicants may also be invited to an interview with a faculty member, and may be required to write a short essay outlining their reasons for applying to the Hospitality and Tourism Technology.

Faculty and Staff

J. Bateman, Director	B. Ellsworth
R. Agon, Program Head	B.J. Fernandes
S. Ayinde	L. Lous
R.A. Brett	C. Morelli
E.J. Cooke	R. Oliver



TECHNOLOGY: Hospitality and Tourism

		Clim hrs/wk
Level 1		
ADMN 100	Micro Economics	3.0
ADMN 103	Management 1	3.0
BCOM 105	Business Communication	3.0
COMP 100	Data Processing — Introduction	4.0
FMGT 101	Accounting	4.0
FMGT 106	Credit and Collections	4.0
HOSP 100	Lounge and Food Service Operations	4.0
HOSP 111	Hospitality Industry Documentation and Communication	3.0
OPMT 111	Business Mathematics	4.0
Level 2		
ADMN 200	Macro Economics	3.0
BCOM 205	Business Communication	3.0
COMP 120	Computers in Business	3.0
FMGT 201	Accounting	4.0
HOSP 200	Food Preparation	4.0
HOSP 206	Rooms Management	3.0
HOSP 209	Front Office Accounting	2.0
HOSP 218	Housekeeping	3.0
HOSP 225	Introduction to Marketing	3.0
TOUR 231	Introduction to Tourism	3.0

PROGRAM: Hotel, Motel and Food Service

Level 3		
HOSP 302	Food and Beverage Management	2.0
HOSP 305	Food Production and Service	6.0
HOSP 313	Food, Beverage and Labor Cost Control...	4.0
HOSP 316	Human Relations, Supervisory Development	2.0
HOSP 325	Marketing and Sales Promotion	5.0
HOSP 375	Practicum in Industry	-
OPMT 131	Business Statistics	4.0
OPMT 165	Basic Management Engineering	3.0

	Clim hrs/wk
Level 4	
ADMN 385 Business Law	3.0
HOSP 402 Food and Beverage Management	2.0
HOSP 405 Food Production and Service	6.0
HOSP 413 Hospitality/Tourism Industry Accounting ...	4.0
HOSP 416 Hospitality Personnel Administration.....	2.0
HOSP 425 Marketing and Sales Promotion.....	4.0
HOSP 430 Facilities Planning and Design	4.0
HOSP 450 Directed Studies.....	4.0

PROGRAM: Travel and Tourism

Level 3	
MKTG 310 Transportation Economics and Regulations.....	3.0
OPMT 131 Business Statistics.....	4.0
TOUR 320 Organizational Behavior.....	3.0
TOUR 326 Travel Marketing, Sales and Promotion	4.0
TOUR 341 Recreational and Resource Development .	3.0
TOUR 342 Travel Transportation Systems.....	3.0
TOUR 343 Tourism Destinations.....	3.0
TOUR 375 Practicum in Industry	-

Level 4	
ADMN 385 Business Law	3.0
HOSP 413 Hospitality/Tourism Industry Accounting ...	4.0
HOSP 430 Facilities Planning and Design	4.0
MKTG 410 Transportation Economics and Regulations.....	3.0
TOUR 420 Organizational Behavior.....	3.0
TOUR 426 Travel Marketing, Sales and Promotion	4.0
TOUR 442 Travel Transportation Systems.....	3.0
TOUR 443 Tourism Destinations.....	3.0
TOUR 450 Directed Study.....	4.0

Course Descriptions

ADMN 100 Micro Economics — The major areas studied are the product and resource market. Students analyze supply and demand, how production costs vary and how prices are determined in various market structures. In addition, resource allocation and economic policy implications are explored.

ADMN 103 Management 1 — An orientation to the nature of business in the private enterprise system embracing forms of business ownership, organization, leadership, management techniques and business elements of production. Typical cases taken from industry are studied to encourage students to think and decide for themselves.

ADMN 200 Macro Economics — Develops an understanding of the organization and operation of the Canadian Economy in an international setting. The theoretical tools of the economist are used to expand the concepts of national income, employment, inflation, money and banking, international trade and growth. An appreciation of the relationship between economic theory and economic policy is provided.

ADMN 385 Business Law — A one-term condensed course to acquaint the business student with a basic knowledge of Canadian law including the legal system, contracts, torts, sale of goods and consumer protection, secured transactions and creditors' remedies, employment law and agency, business organizations, negotiable instruments, real estate and administrative law.

BCOM 105 Business Communication — An applied writing course concentrating on effective letters and memos. Topics and case assignments are selected to develop the skills necessary for successful management communication in the hospitality

and tourism industries.

BCOM 205 Business Communication — Adds report design techniques to the skills learned in BCOM 105. Students write several types of informational, periodic and analytical reports designed to meet specific management needs. Prerequisite: BCOM 105.

COMP 100 Data Processing — Introduction — Offers training in basic data processing principles to develop recognition of the application of these principles to industry. The major functions of data processing will be illustrated and practised with a mini-computer operating interactively. Elementary programs will be written and tested on the computer. Use of flow-charting and elementary data processing systems design will illustrate the achievement of data processing objectives.

COMP 120 Computers in Business — Designed to give the student an understanding of business computer systems. Topics include computer hardware — types, usage, evaluation; systems development — feasibility studies, analysis, design, implementation; packaged software — use and evaluation. Emphasis will be placed on areas of particular interest to Hospitality and Tourism Industries.

FMGT 101 Accounting — Permits persons with little or no accounting background to become familiar with the techniques of working through the full accounting cycle. It provides theoretical and practical training in basic accounting as preparation for FMGT 201. Topics include accounting as an information system; introduction to accounting theory; income measurement; traditional record-keeping procedures; the accounting cycle; special journals; cash; investments and receivables.

FMGT 106 Credit and Collections — A detailed examination of credit granting, collection techniques and credit philosophy in all levels of business prepares the student to assist the credit manager of a large or small business in any area of the subject. Topics include determining credit risk; credit instruments and collateral security; types of consumer credit and credit cards; sources of consumer credit information; collections; credit department management.

FMGT 201 Accounting — The follow-up to FMGT 101, topics include inventory, long-lived assets, liabilities, forms of business organizations, cash-flow and working capital analysis, manufacturing accounting, management accounting, consolidated statements, analysis of financial statements and price level changes. Prerequisite: FMGT 101.

HOSP 100 Lounge and Food Service Operations — Covers the basic requirements needed to operate a bar or lounge. Subject areas include bar layout and design, B.C. Liquor Act, liquor classification and manufacture of spirits, wine and beer. Practical mixology in preparation of cocktails, pouring techniques, garnishes, mixes and setting up the bar. Basic food and lounge service techniques are also covered.

HOSP 111 Hospitality Industry Documentation and Communication — An introduction to the principles of effective public speaking. The course allows students to develop confidence and to practice various types of public speaking: narrative, descriptive, persuasive, demonstrative, meeting and debate. The course also explores industry communication including resume development, letters of transmittal, practice with interview techniques and preparation of an interview.

HOSP 200 Food Preparation — Covers the basic skills required in preparing food, and lays the groundwork for more advanced skills in the 2nd year. Enables participants to operate kitchen equipment safely, apply sanitation procedures, read, follow and

prepare recipes, classify and prepare soups, stocks, sauces, fish and shellfish, meat, poultry, vegetable and egg dishes.

HOSP 206 Rooms Management — An introduction to the terminology and fundamental procedures used in hotel front office operations. The course explores front desk design and location, check-in/check-out procedures, reservation systems, guest services, cash and credit, psychology in dealing with guests, fellow employees and management; guest history systems, form designs and how they are used, equipment and materials, rooms salesmanship and handling complaints.

HOSP 209 Front Office Accounting — Takes the student through hotel front office accounting from the initial setting up of guest accounts-posting procedures and corrections to settling accounts and night audit procedures. The student will first be instructed in the manual system followed by demonstrations on mechanical and electronic systems. Finally, students will examine computer applications.

HOSP 218 Housekeeping — Explores the other major part of rooms management housekeeping. The course introduces the terminology, job descriptions, policies and procedures, equipment and materials found in this large department of a hotel. Budgeting and staff scheduling are also included. Subject areas include basic interior design, basic cleaning techniques, critical path for hotel openings, personnel requirements and overall inter-relationships with other hotel departments.

HOSP 225 Introduction to Marketing — Includes a detailed study of basic marketing functions, marketing research, product planning, selection of trade channels, merchandising, advertising, sales promotion and salesmanship. Marketing of consumer goods as well as industrial goods will be covered.

HOSP 302/402 Food and Beverage Management — Covers the theoretical application of food service management through lectures, assignments and seminars. Topics include the elements of management, training, and personnel management, menu making, purchasing requirements for food service systems; various types of restaurants (specialty, fast food, dining rooms, etc.) payroll systems, catering establishments, merchandising and promotional techniques, and a wine seminar.

HOSP 305/405 Food Production and Service — Applies theory from the lectures to practical laboratory sessions in a public dining room setting and in the cafeteria's main kitchen. Areas covered include serving, cashiering, hosting, bartending and managing food preparation techniques. Includes rotation of various stations in a kitchen: short order, meats, fish, shellfish, vegetables, salads, soups, stocks and sauces.

HOSP 313 Food, Beverage and Labor Cost Control — Fundamentals of internal controls and information systems for food and beverage operations. The course covers techniques of effective purchasing, receiving and production; sales controls; food and beverage cost calculations; the sales mix and its effect on costing. Course emphasis is on interpretation of data for effective and profitable decision-making. Labor cost controls methods are explained and discussed.

HOSP 316 Human Relations, Supervisory Development — Develops an understanding of the managerial skills and qualities needed in the hospitality industry; at the same time, the course focuses on developing the important "hospitality attitude". Leadership, motivation, stress, change and labor relations are all addressed. The management of people in the people business calls for clear and positive communication and this is a theme throughout the course.

HOSP 325 Marketing and Sales Promotion — Develops students' ability to apply the fundamentals of marketing to the

hospitality, tourism and food service industry. Market segmentation, analysis and trend projection, market research, product strategy, real estate, leases, franchise agreements are all addressed. The course builds an understanding of all of the forces that impact the marketing mix and leads to the development of the market plan.

HOSP 375 Practicum in Industry — During the first month of Term 1, Year 1, each student will receive a "Career Passport of Hospitality and Tourism Experience" in which practical work experience will be recorded. The objective of the practicum is to provide each student with a minimum of 500 hours of proven work experience in the industry prior to graduation. Some credit may be given for work experience prior to registering at BCIT. No grade is assigned to this practicum.

HOSP 413 Hospitality/Tourism Industry Accounting — Preparation, interpretation and analysis of balance sheets and profit and loss statements; ratio analysis, budgeting and forecasting; feasibility studies; financing and cash flow; cost-volume-profit analysis; investment decision-making as applied to the Hospitality/Tourism Industry.

HOSP 416 Hospitality Personnel Administration — Addresses the staffing process within the hospitality field. The development of job descriptions, performance standards, recruitment, selection systems, training methods and employee assessment techniques are examined. The course is specific in its approach to the labor relations field. It addresses the collective agreements that apply to the hospitality and tourism sectors and develops the understanding to enable the student to administer creatively within contracts. The Labour Code and Employment Standards Act are covered with specific attention to the scheduling and management of tipped and non-tipped employees.

HOSP 425 Marketing and Sales Promotion — Continues with the application and implementation of the marketing plan: product repositioning, setting up the sales office, development of sales tools and brochures, advertising, promotions, public relations, in house sales, external sales, salesplanning, media planning and budgeting. These topics are addressed in detail and, through practicum and case study, are applied directly to the hospitality, tourism and food service product. The inter-relationships of tourism industry components: carrier, wholesaler, agent, ground and transfer packages are addressed as they apply to the hospitality sector.

HOSP 430 Facilities Planning and Design — A study of the building and construction trades as they relate to the needs of the hospitality, tourism and food services industry. The ability to read and interpret blue prints, building codes, renovation cost estimates, zoning and city bylaws are studied. The fundamentals of building, sound maintenance practices, room design, functional planning, space requirements are all addressed as are the esthetics of light, sound, themes and atmospheres.

HOSP 450 Directed Studies — One day a week will be set aside for an independent study project. It is expected that some instructor or coordinator input will be generated for up to three hours per week during the term, to set direction and tone for projects.

MKTG 310/410 Transportation Economics and Regulations — Deals with transport costing, economic regulation and other types of regulation. The modes involved will include air, highway, rail and water. The course will emphasize the economics, liabilities and regulations of passenger travel and passenger possessions (baggage). An overview of cargo, including dangerous commodities, will also be given. Topics include cartels and conferences, governmental cooperation, United Nations Committees concerning travel and aspects of immigration and customs.

OPMT 111 Business Mathematics — Provides a review of basic mathematics applicable to business and industry and enables the student to acquire skills involving practical financial and mathematical problems encountered in business. Topics in the area of Mathematics of Finance will emphasize retail operations, discounts, simple and compound interest and annuities.

OPMT 131 Business Statistics — Major emphasis on descriptive statistics, including survey planning, questionnaires design, numerical and graphical presentation of data. Measures of central tendency and dispersion. Introduction to statistical inference through sampling, confidence intervals, hypothesis testing, linear regression. Emphasizes managerial applications in industry.

OPMT 165 Management Engineering — Management Engineering is concerned with achieving business goals through the most effective use of resources by objective decision-making. It is a general management course designed to supplement the specialized management courses given in the Hospitality Program. The course covers the decision-making process in four areas of application; time management, productivity improvement, project management and facility planning.

TOUR 231 Introduction to Tourism — An introduction to the Travel and Tourism industry including why tourism is growing in domestic and international markets; functions and inter-relationships of the various industry sectors; major organizations and associations and their influence on tourism; exploration of career opportunities in all facets of tourism; economic import of tourism and government initiatives in encouraging growth; current trends in travel; social and environmental impacts of tourism.

TOUR 320/420 Organizational Behavior — Examines personnel problems regarding people at work in all kinds of organizations. Includes human resource recruitment and selection, training and development, career planning, employee motivation, health and safety, discipline, stress, collective agreements, personnel audit. Includes industry participation.

TOUR 326 Travel Marketing, Sales and Promotion — Emphasis is on applying general marketing concepts and techniques to the travel industry including government marketing agencies, air and surface carriers, tour operators and travel agencies; how and where they inter-relate, consumer demand and competition to serve; product definition and product packaging; consumer awareness of travel; marketing use of audiovisual aids, are some of the topic areas that will be studied.

TOUR 341 Recreational and Resort Development — Explores the need and the resources necessary for establishing a strong regional attraction for the recreational, sport and vacation traveller. Topics include development of resort locations; fishing, hunting and sport resorts; ski and water resorts; seasonal developments; promotion of tourist regions depending on recreational travel. While the emphasis may be strongly B.C., in-bound popular resort areas including Hawaii, Florida, Mexico and Nevada will also be discussed.

TOUR 342/442 Travel Transportation Systems — Covers transportation systems such as ferries, cruise ships, bus, rail, rental cars and taxis. Major emphasis in this course is on air travel and the ability to quote both normal and special fares and produce schedules and tickets for airline customers. The course will also teach the use of ticketing terminology and passenger rules and regulations.

TOUR 343/443 Tourism Destinations — Provides a survey of the major tourism destinations frequented by the travelling public. These destinations include North and South America, Europe, the South Pacific and Pacific Rim. Subject areas include historical and geographical knowledge of the areas as well as

culture, dress and language; social traditions; economic conditions and currency; foods; industry and educational standards; tourist attractions.

TOUR 375 Practicum in Industry -- See HOSP 375.

TOUR 426 Travel Marketing, Sales and Promotion — This course is an extension of Travel Marketing with greater emphasis on promotion, personal selling techniques and salesmanship. Topics will include making personal client presentations, services and itinerary planning, dealing with media and advertising agencies, developing advertising pieces of creative promotion, communication of the printed word and pictures; understanding client behavior, implications of budget on the selling function.

TOUR 450 Directed Studies — See HOSP 450.

Marketing Management Technology

Marketing is the task of making available the service a firm or organization can offer to satisfy the needs of its customers or patrons. This means that people with marketing skills are needed in a wide range of organizations to perform many different functions. Manufacturers, professional services and non-profit institutions depend on marketing to sustain a viable, efficient operation.

Marketing managers concentrate on product development, market research, sales and promotion or they may find their jobs require the broad skills of all these areas.

The Marketing Technology is designed to equip the graduate with a solid generalist background, *plus* allowing the student to concentrate on the unique skills associated with specific sectors of our economy. These include the technical consumer or industrial product/service sector; the Real Estate industry; the international trading sector and the business communications industry.

Job Opportunities

The **Advanced Technology Marketing** program leads to career positions in manufacturing, wholesale and retailing firms, with emphasis on firms and industries that are exploiting new or rapidly changing technologies.

The **Professional Sales** program prepares individuals for positions in distribution companies that sell their products and services to commercial buyers and purchasing agents.

The **Real Estate Studies** program prepares the graduate for sales, agent, mortgage brokerage, appraisal, property management, investment analyst positions. Graduates may choose to pursue either licenced or non-licenced positions within the Real Estate industry.

Advertising and Sales Promotion graduates are employed in advertising agencies, broadcasting companies, publishing firms and in-house promotion operations.

The **Small Business Development** program is ideally suited to individuals planning to start their own businesses or becoming general managers in an established small firm.

The Program

In the first year, all Marketing Technology students complete the same course of studies covering general business and economic principles. The second year offers specialization. **Technical Sales and Marketing** emphasizes sales skills, new product development and entrepreneurship. **Real Estate Studies** addresses residential and commercial property sales and investment analysis skills. **Advertising and Sales Promotion** courses develop creative communication skills and campaign planning.



Prerequisites

Algebra 11 and English 12 both with C+ are course requirements for this program. Completion of grade 11 and 12 science courses enhance chances for success in the program.

Candidates **must** state program preference when applying for admission to the first year of the Marketing Technology. Business experience and/or other successful post-secondary education is an asset. Admission may be granted to mature students provided they have completed high school at least 2 years prior to date of entry, are willing to complete pre-entry preparatory programs, and have acquired prerequisite work experience. Upon completion of the first year, candidates will be screened for appropriate second year option placement.

Faculty and Staff

R.W. Vandermark, B.A., Department Head
 G.H. Abbott, B.Comm., M.B.A.
 P. Cherry, B.Comm.
 D.K.N. Chowdhury, B.Sc., M.B.A., Ph.D.
 J.O. Hicks, R.I. (B.C.), F.R.I., Program Head, Real Estate Studies
 G.T. Jacobs, B.A. (Hist. & Econ.), B.A., (Bus. Admin.), M.B.A.
 C.G. Nelson, B.A.
 N. Osborne, M.B.A., P.Eng., R.I.(B.C.)
 L. Rapchuk, B.Comm.
 G.S. Rees, M.B.A.
 M.I. Shacker, B.A., B.B.A., Program Head, Technical Sales and Marketing
 R.A. Venne, B.Comm., (Hons. Econ.), M.B.A.
 W.A.E. Walley, B.A.
 T. Winder, B.A., M.B.A., Program Head, Advertising and Sales Promotion.

TECHNOLOGY: Marketing

	Cirm hrs/wk
Level 1	
ADMN 100 Micro Economics	3.0
ADMN 110 Fundamentals of Management	3.0
BCOM 106 Business Communication for Marketing ...	3.0
COMP 100 Data Processing Introduction	4.0
FMGT 101 Accounting 1	4.0
MKTG 100 Marketing 1	3.0
OPMT 110 Business Mathematics	4.0
Level 2	
ADMN 200 Macro Economics	3.0
BCOM 206 Business Communication for Marketing ...	3.0
COMP 120 Computers in Business	3.0
FMGT 201 Accounting 2	4.0
MKTG 103 Sales Skills	4.0
MKTG 200 Marketing 2	3.0
OPMT 130 Business Statistics	4.0

PROGRAM: Professional Sales

Level 3	
FMGT 403 Marketing Management Accounting	4.0
MKTG 203 Sales Management	4.0
MKTG 301 Quantitative Methods/Computer Applications in Marketing	4.0
MKTG 302 Industrial Marketing	4.0
MKTG 308 Advertising and Sales Promotion	4.0
MKTG 309 Marketing Research 1	4.0
Level 4	
ADMN 385 Business Law	3.0
MKTG 305 International Marketing	4.0
MKTG 401 Marketing Planning	4.0
MKTG 402A Advanced Sales Techniques	2.0
MKTG 403B Industrial Sales Practicum	2.0
MKTG 409 Marketing Research 2	3.0
MKTG 418 Directed Studies	3.0
MKTG 430 Distributive Systems	3.0

PROGRAM: Advanced Technology Marketing

Level 3	
FMGT 403 Marketing Management Accounting	4.0
MKTG 203 Sales Management	4.0
MKTG 301 Quantitative Methods/Computer Applications in Marketing	4.0
MKTG 304 Market Strategies	4.0
MKTG 308 Advertising and Sales Promotion	4.0
MKTG 309 Marketing Research 1	4.0
Level 4	
ADMN 385 Business Law	3.0
MKTG 305 International Marketing	4.0
MKTG 401 Marketing Planning	4.0
MKTG 404B Information Systems Practicum	2.0
MKTG 406A Product Development	2.0
MKTG 409 Marketing Research 2	3.0
MKTG 418 Directed Studies	3.0
MKTG 430 Distributive Systems	3.0

PROGRAM: Small Business Development

Level 3		Cirm hrs/wk
FMGT 403 Marketing Management Accounting		4.0
MKTG 203 Sales Management		4.0
MKTG 301 Quantitative Methods/Computer Applications in Marketing		4.0
MKTG 306 Principles of Small Business Management		4.0
MKTG 308 Advertising and Sales Promotion		4.0
MKTG 309 Marketing Research 1		4.0
Level 4		
ADMN 385 Business Law		3.0
MKTG 305 International Marketing		4.0
MKTG 401 Marketing Planning		4.0
MKTG 407A Case Studies/Entrepreneurship		2.0
MKTG 408B Business Planning Practicum		2.0
MKTG 409 Marketing Research 2		3.0
MKTG 418 Directed Studies		3.0
MKTG 430 Distributive Systems		3.0

PROGRAM: Real Estate Studies

Level 3		
FMGT 403 Marketing Management Accounting		4.0
MKTG 308 Advertising and Sales Promotion		4.0
MKTG 309 Marketing Research 1		4.0
MKTG 311 Real Estate Management 1		4.0
MKTG 312 Economics of Real Estate Markets		4.0
MKTG 313 Introduction to Real Estate Analysis		4.0
Level 4		
ADMN 385/486 Business Law/Property Law		4.0
MKTG 330 Real Estate Practice		2.0
MKTG 409 Marketing Research 2		3.0
MKTG 411 Real Estate Management 2		4.0
MKTG 412 Intro to Real Estate Appraisal and Investment Analysis		4.0
MKTG 413 Mortgage Finance		3.0
MKTG 418 Directed Studies		4.0

PROGRAM: Advertising and Sales Promotion

Level 3		
FMGT 403 Marketing Management Accounting		4.0
MKTG 203 Sales Management		4.0
MKTG 301 Quantitative Methods/Computer Applications in Marketing		4.0
MKTG 309 Marketing Research 1		4.0
MKTG 316 Principles of Advertising		4.0
MKTG 318 Media Planning		4.0
Level 4		
ADMN 385 Business Law		3.0
MKTG 317 Promotional Marketing		4.0
MKTG 401 Marketing Planning		4.0
MKTG 409 Marketing Research 2		3.0
MKTG 416 Advertising Internship		6.0
MKTG 417 Design Production		4.0

Course Descriptions

ADMN 100 Micro Economics — The major areas studied are the product and resource market. Students analyze supply and demand, how production costs vary and how prices are determined in various market structures. In addition, resource allocation and economic policy implications are explored.

ADMN 110 Fundamentals of Management — An orientation to the nature of business in the private enterprise system embracing forms of business ownership, organization, leadership, management techniques and business elements of production. Typical cases taken from industry are studied to encourage students to think and decide for themselves.

ADMN 200 Macro Economics — Develops understanding of the organization and operation of the Canadian Economy in an International setting. The theoretical tools of the economist are used to expand the concepts of national income employment, inflation, money and banking international trade, and growth. An appreciation of the relationship between economic theory and economic policy is provided.

ADMN 385/485 Business Law/Property Law — A one-term course. ADMN 385 acquaints the business student with a basic knowledge of Canadian law including the legal system, contracts, torts, sale of goods and consumer protection, secured transactions and creditors' remedies, employment law and agency, business organizations, negotiable instruments, real estate and administrative law. ADMN 485 covers legislation and local instruments used in real property transactions.

BCOM 106 Business Communication for Marketing — Introduces students to the fundamentals of business writing. Students study various marketing communications, including letters, memos, questionnaires and news releases.

BCOM 206 Business Communication for Marketing — Extends the material covered in BCOM 106 and deals with both written and oral presentations. Short and long reports, job application packages, research techniques and graphic techniques are covered. Emphasis is on practical aspects of professional marketing communication. Prerequisite: BCOM 106.

COMP 100 Data Processing — Introduction — Offers training in basic data processing principles to develop recognition of the application of these principles to industry. The principal functions of data processing are illustrated and practised with an H.P. minicomputer operating interactively. Elementary computer programs are written and tested on the computer. Use of flow-charting and elementary data processing systems design will illustrate the achieving of data processing objectives.

COMP 120 Computers in Business — Designed to give the student an understanding of business computer systems. Topics include computer hardware — types, usage, evaluation; systems development — feasibility studies, analysis, design, implementation; packaged software — use and evaluation. Emphasis will be placed on particular areas of interest to the specific technologies. Prerequisite: Comp 100.

FMGT 101 Accounting 1 — Permits persons with little or no accounting background to become familiar with the techniques of working through the full accounting cycle. It provides theoretical and practical training in basic accounting as preparation for FMGT 201. Topics include accounting as an information system; introduction to accounting theory; income measurement; traditional record-keeping procedures; the accounting cycle; special journals; cash; investments and receivables.

FMGT 201 Accounting 2 — The follow-up to FMGT 101, topics include inventory, long-lived assets, liabilities, forms of business organizations, cash-flow and working capital analysis, manufacturing accounting, management accounting, consolidated statements, analysis of financial statements and price level changes. Prerequisite: FMGT 101.

FMGT 403 Marketing Management Accounting — Emphasis is upon profit planning, pricing strategies and control in the marketing environment. Also studied are cost-accounting control concepts and applications, inventory management techniques, cash and capital planning techniques and revenue reporting systems. The course ends with a study of the implications for managerial decision-making of accounting reporting methods and policy. Prerequisite: FMGT 201, ADMN 110, MKTG 200, OPMT 110, OPMT 130.

MKTG 100 Marketing 1 — A comprehensive study of the foundations and principles of marketing intended for those students pursuing a concentrated marketing based program. Covers basic marketing functions, marketing research, product planning, distribution activities, sales and promotion activities. Examines marketing in relation to all types of consumer, industrial and service firms.

MKTG 103 Sales Skills — Introduction to professional selling. Emphasizes practical problems of locating and qualifying prospects, use of depth approach and improving sales preparation and organization. Some examination also given to improving interpersonal communications in non-selling situations.

MKTG 200 Marketing 2 — a continuation of MKTG 100. Prerequisite: MKTG 100.

MKTG 203 Sales Management — General principles of sales management. Emphasis is given to the human resource, with stress placed on selection, assimilation, training and supervision. Examination of sales research, planning, organization and analysis is made. Computer applications in sales management are also covered. Prerequisite: ADMN 100, ADMN 110, ADMN 200, BCOM 207, COMP 120, FMGT 201, MKGT 103, MKGT 200.

MKTG 301 Quantitative Methods/Computer Applications in Marketing — An examination of decision support systems now available utilizing mathematical modelling methods, data bank access, and computer based information. Prerequisite: ADMN 100, ADMN 110, OPMT 110, ADMN 200, BCOM 207, COMP 120, FMGT 201, MKTG 200, OPMT 130.

MKTG 302 Industrial Marketing — An examination of the complex purchase process faced by companies selling to industry, government and institutions. Alternative distribution and pricing strategies are considered. Emphasis is on understanding the growing British Columbia industrial base. Prerequisite: ADMN 100, ADMN 200, BCOM 207, MKTG 200.

MKTG 304 Market Strategies — The development of strategies suited to high technology products and services to achieve productivity improvement. Prerequisite: ADMN 100, ADMN 200, BCOM 207, MKTG 200.

MKTG 305 International Marketing — An examination of import/export procedures, particularly in relation to sophisticated technology products and services. Trading patterns and forecasts are thoroughly covered. Prerequisite: ADMN 100, ADMN 200, BCOM 207, MKTG 200.

MKTG 306 Principles of Small Business Management — Examination of the planning stages involved in starting a new business including market, financial and legal feasibility require-

ments. Prerequisite: ADMN 100, ADMN 110, ADMN 200, BCOM 207, FMGT 201, MKTG 200.

MKTG 308 Advertising and Sales Promotion — Covers fundamentals of mass communications, media characteristics, message design and campaign planning. Prerequisite: BCOM 207, MKTG 200.

MKTG 309 Marketing Research 1 — Examines the basic approaches to marketing research. It discusses the techniques and tools of this research and relates these tools to the decision-making process. Emphasis is placed on the use of marketing research in the total marketing decision concept. Special applications of marketing research to simulated real-life situations are examined. Prerequisite: ADMN 100, ADMN 200, BCOM 207, COMP 120, MKTG 200, OPMT 110, OPMT 130.

MKTG 311 Real Estate Management 1 — The real estate function includes law, estates and interests in land, and the personal and business management decision process. The economic characteristics of urban real estate and the market, city growth and development, locational factors in influencing the determination of land use and ownership, institutional lenders, the mortgage market and the functions of the real estate agency, salesman and appraiser are covered. This is a credit course recognized by the Real Estate Council of British Columbia and the Department of Real Estate Studies at UBC. It exempts the student entering the real estate brokerage business from the salesman's pre-licensing course. Prerequisite: ADMN 100, ADMN 200, BCOM 207, COMP 120, MKTG 200, OPMT 130.

MKTG 312 Economics of Real Estate Markets — Lays the foundation for a sound education in property management. The course thoroughly familiarizes the student with the basic theories and techniques of managing real estate investment. On completion of the course, the student will have an insight into the long-range welfare of the investment property and be familiar with the day-to-day skills necessary to manage residential and commercial properties. Students obtain credit for this course toward the designation of Certified Property/Manager with the Institute of Real Estate Management. Prerequisite: ADMN 100, ADMN 200, BCOM 207, COMP 120, MKTG 200, OPMT 110, OPMT 130.

MKTG 313 Introduction to Real Estate Analysis — Presents the tools and techniques for analysis that assist decision making in specific real estate problems including investment (purchase or sale), financing, development or redevelopment, leasing, income and property taxation and property management. In each of these areas, the use of mathematics of finance is central to analysis of the situation, the analysis of alternative courses of action and the comparison of costs/benefits, both today and in the future. Prerequisite: ADMN 100, ADMN 200, BCOM 207, COMP 120, MKTG 200, OPMT 110, OPMT 130.

MKTG 316 Principles of Advertising — Examines the evolution and function of advertising and sales promotion within the contexts of society and the business system. The topic is surveyed rigorously, with consideration being given to its application in the fields of retailing, wholesaling, manufacturing, professional and industrial activities. Prerequisite: ADMN 100, ADMN 200, BCOM 207, MKTG 200, OPMT 110, OPMT 130.

MKTG 317 Promotional Marketing — A study of all promotional support activities such as trade shows, publicity, special events, direct response marketing and promotional specialties. Emphasis is on when and how to use them. Prerequisite: ADMN 100, ADMN 200, BCOM 207, MKTG 200, MKTG 316, MKTG 318.

MKTG 318 Media Planning — Emphasis is placed on development and execution of the media plan. Close contact is main-

tained by students with agency media buyers and other industry factors to ensure a practical direction to the course. Quantitative media planning techniques are evaluated in light of most recent computer applications. The main objective of this course is to provide marketable skills in media planning and buying to qualify students for career entry consideration in advertising agencies. Prerequisite: BCOM 207, COMP 120, MKTG 200, OPMT 110, OPMT 130.

MKTG 330 Real Estate Practice — Designed to apply the principles learned in real estate management on a practical basis. Students will learn to complete contracts required in real estate transactions; the forms of legal documentation concerning interests in land; land registration procedures; and how to search a title of real property at a land title office. Prerequisite: ADMN 100, ADMN 200, BCOM 207, MKTG 311, MKTG 200, OPMT 110, OPMT 130.

MKTG 401 Marketing Planning — Examines how to develop a formal marketing plan including situation analysis, market and competitive conditions research, objective setting and action scheduling using computer based management systems. Prerequisite: ADMN 100, ADMN 200, BCOM 207, COMP 120, FMGT 201, MKTG 103, MKTG 200, MKTG 301, MKTG 309, OPMT 110, OPMT 130.

MKTG 402A Advanced Sales Techniques — Professional selling skills utilizing buyer behavior, product knowledge, time management and sales call planning tools. Prerequisite: MKTG 103, MKTG 200, MKTG 203, MKTG 302, MKTG 308.

MKTG 403B Industrial Sales Practicum — Field work experience with the sales force of a sponsoring firm. Full evaluation of on-the-job performance is included. Prerequisite: MKTG 103, MKTG 203, MKTG 402.

MKTG 404B Information Systems Practicum — Examines the hardware/software systems, data sources, and resources available to marketers of high-tech products in gathering and dispensing needed information. Prerequisite: MKTG 301, MKTG 304, MKTG 309, MKTG 406.

MKTG 406A Product Development — A study of effective processes for generating product ideas, design planning, performance evaluation and market testing. Commercialization of highly innovative products is emphasized. Prerequisite: MKTG 301, MKTG 304, MKTG 309.

MKTG 407A Case Studies/Entrepreneurship — An analysis of both successful and unsuccessful ventures to reveal the role of the entrepreneur. Prerequisite: MKTG 306.

MKTG 408B Business Planning Practicum — Involves the student in the detailed preparation of a business prospectus. The student is required to demonstrate the legal markets and financial feasibility of a selected new venture. Prerequisite: MKTG 306, MKTG 407.

MKTG 409 Marketing Research 2 — Examines the basic approaches to marketing research. The course discusses the techniques and tools of this research and relates these tools to the decision-making process. Emphasis is placed on the use of marketing research in the total marketing decision concept. Special applications of marketing research to simulated real-life situations are examined. Prerequisite: MKTG 309.

MKTG 411 Real Estate Management 2 — see MKTG 311. Prerequisite: MKTG 311.

MKTG 412 Introduction to Real Estate Appraisal and Investment Analysis — Designed for use by appraisers, real estate

brokers, lenders, builders and assessors. On completion of the course the student will have learned how to apply appraisal principles and techniques to actual residential appraisal problems. To become a professional appraiser, the student completing this course must add meaningful practical appraisal experience and further advanced training. The material covered will include such topics as principles of real estate, elements of urban land economics, nature and principles of real estate value, appraising as applied economics analysis, etc. For students seeking credit in recognized programs of professional appraising societies. Prerequisite: MKTG 311, MKTG 312, MKTG 313.

MKTG 413 Mortgage Finance — Will enable students to demonstrate a knowledge of the macro-economic aspects of Canada's mortgage market; structure and analyse both residential and commercial mortgage loan applications and be familiar with loan management; analyse preferred refinancing vehicles from the perspectives of borrower and lender; be familiar with loan management; analyse preferred refinancing vehicles from the perspectives of borrower and lender; be familiar with contemporary repayment arrangements, development financing, participation loans, leasehold financing and appraisal for mortgage lending. Prerequisite: MKTG 311, MKTG 312, MKTG 313.

MKTG 416 Advertising Internship — An assigned work experience position with a lower mainland advertising, promotion, broadcasting, print or graphic services operation. On-the-job performance is fully evaluated. Prerequisite: MKTG 316, MKTG 317, MKTG 318, MKTG 417.

MKTG 417 Design Production — Creative advertising starts with a powerful idea built upon a sound business strategy. The execution of the strategy can polish effective advertising into brilliance. This is a practical "how-to" course that starts with business direction and finishes with actual print and broadcast advertising. It examines computer graphics, laser separations as well as basic art design techniques. Of interest to those in advertising positions, media sales and graphic/printing sales as well as those with a general interest in the area. Prerequisite: MKTG 316.

MKTG 418 Directed Studies — One day a week of the student's timetable is allocated to carry out a major project. The project will be in a marketing area of the student's choice, carried out under the guidance of assigned faculty members. Prerequisite: ADMN 100, ADMN 200, BCOM 207, COMP 120, FMGT 201, MKTG 103, MKTG 200, MKTG 203, MKTG 309, OPMT 110, OPMT 130.

MKTG 430 Distributive Systems — A study of the channels and supporting infrastructure necessary to move products from manufacturer to consumer, including coverage of new technology applications to retailing and merchandising systems. Prerequisite: ADMN 100, ADMN 200, BCOM 207, COMP 120, FMGT 210, MKTG 103, MKTG 200, MKTG 203, OPMT 110, OPMT 130.

OPMT 110 Business Mathematics — Review of basic mathematics applicable to business and industry. Mathematics of finance including retail operations, simple and compound interest, discounts, annuities, financial papers and depreciation methods. Emphasis is on practical applications to business administration.

OPMT 130 Business Statistics — Major emphasis is on descriptive statistics, including numerical and graphical presentation of data, measures of central tendency and dispersion, elementary probability, index numbers and time series. Introduction to inferential statistics through selected topics such as sampling, confidence limits of the mean, hypotheses testing and simple linear regression.

Operations Management Technology

The department offers **two diploma programs**: Operations Management and Transportation Distribution Management which has an International Trade option in its 4th level. Note: **Potential students should scrutinize these two programs carefully to ascertain which field of studies they wish to pursue.**

Operations Management Program

We offer our students a stimulating, practical 2-year program which combines engineering and business. Our graduates possess the sought after skills that help industry become more productive.

During your time with us, you will be taking courses in industrial engineering, human dynamics, materials management and computer systems. This program stresses productivity improvement so that, upon graduation, you will be prepared to solve business problems and become a valued member of the management team.

Operations Management program graduates are excellent candidates to pursue professional membership in:

- The Institute of Industrial Engineers,
- The American Production and Inventory Control Society,
- International Material Management Society,
- Data Processing Management Association,
- Project Management Institute

Job Opportunities

Graduates have found career opportunities in a variety of industries including manufacturing, service, distribution and government.

Operations Management program graduates may work in a variety of dynamic, highly paid management careers such as: production scheduler, inventory manager, industrial engineer, systems analyst, production supervisor, data processing manager, management engineer, programmer analyst, inventory planner, quality control inspector, buyer, materials manager, purchaser, work study analyst, project planner, warehouse supervisor, terminal manager

Students applying for admission to Operations Management program should ask themselves the following questions:

- Do I want to be a manager?
- Do I enjoy a challenge?
- Do I like working with people?
- Do I want to work with computers?
- Do I welcome the opportunity to improve performance by changing present systems?
- Do I want to develop systematic problem-solving ability?

If the answer is yes — then apply to the Operations Management Technology program of your choice and start charting your future.



Prerequisites

Algebra 11 with a C+ (Physics II is desirable for Operations Management program). This requirement may be waived for mature students on approval by the Department Head. If your mathematical skills are in doubt, it is recommended that you take Preparatory Business Math OPMT 099. It is also recommended that potential students acquire basic typing skills due to the extensive use of computer input terminals in the program.

Faculty and Staff

B.R.M. Morrow, B.Comm., Department Head
C. Chan, M.B.A.
B. Curtis, M.B.A.
S.E. Dudra, B.Comm., M.B.A., C.P.I.M.
F.L. Gruen, B.Mgt.Eng., M.A.Sc.
P.R. Harrison, M.B.A., P.Eng., M.I. Mech.E
K.C. Hartley, B.A.Sc., P.Eng., C.P.I.M.
A.S. Lee, B.Eng., P.Eng., M.Ed.
J.E. Lloyd, M.Ed., P.Eng., Chief Instructor
P. McSorley
D.W. Malcolm, B.Sc., A.Sc.T.T.
D.J. Mallory, B.A.Sc., M.A., Ph.D.
J.A.I. Millette, B.A., M.Ed.
G.W. Murray, Dipl.T., Program Head
H.T. Pevecz, Dipl.T., B.Econ., Program Head
J. Ribic, B.I.E.
G. Sagar, B.A.Sc., M.B.A.
W.J. Sheriff, B.A., B.Sc., Chief Instructor
L.A. Smith, Dipl.T., C.A.M.
C.V. Spong, Dipl.T.
J. Young, B.Sc., M.B.A., P.Eng.

TECHNOLOGY: Operations Management

		Clim hrs/wk
Level 1		
BCOM 107	Business Communication.....	3.0
CHSC 122	Engineering Concepts.....	3.0
COMP 100	Data Processing — Introduction.....	4.0
FGMT 102	Introduction to Financial Accounting.....	3.0
MECH 102	Drafting.....	2.0
OPMT 100	Applied Mathematics 1.....	5.0
OPMT 140	Introduction to Operations Management...	3.0
OPMT 150	Introduction to Microcomputers.....	2.0
OPMT 160	Method Study 1.....	3.0
PHYS 117	Basic Science for Operations Management.....	3.0
Level 2		
ADMN 200	Macro Economics.....	3.0
ADMN 221	Organizational Behavior Fundamentals....	2.0
BCOM 207	Business Communication for Operations Management.....	3.0
FMGT 202	Introduction to Managerial Accounting.....	3.0
MECH 207	Engineering Concepts.....	3.0
OPMT 120	Applied Mathematics 2.....	4.0
OPMT 240	Industrial Engineering.....	4.0
OPMT 251	Systems Analysis and Design.....	3.0
OPMT 250	Computer Programming — Applied BASIC.....	3.0
PHYS 217	Basic Science for Operations Management.....	3.0
Level 3		
ADMN 100	Micro Economics.....	3.0
ADMN 343	Personnel Fundamentals.....	2.0
FMGT 306	Cost Accounting-Operations Management	3.0
OPMT 244	Performance Measurement.....	4.0
OPMT 300	Quantitative Methods 1.....	5.0
OPMT 340	Applied Industrial Engineering 1.....	5.0
OPMT 348	Production and Inventory Management 1..	5.0
OPMT 351	Microcomputer Data Base Processing.....	3.0
Level 4		
		4A 4B
ADMN 330	Industrial Relations.....	0.0 4.0
OPMT 156	Supervision.....	2.0 2.0
OPMT 157	Marketing Research.....	2.0 2.0
OPMT 245	Quality Assurance (Manufacturing).....	2.0 0.0
OPMT 400	Quantitative Methods 2.....	7.0 3.0
OPMT 440	Applied Industrial Engineering 2..	9.0 0.0
OPMT 448	Production and Inventory Management 2.....	5.0 2.0
OPMT 449	Industrial Engineering Concepts..	0.0 17.0
OPMT 450	Computers and Information Processing 2.....	3.0 0.0

TRANSPORTATION/DISTRIBUTION PROGRAM

In today's changing world, managers must be flexible and well equipped with the skills necessary to appreciate and understand rapidly developing technologies.

The Transportation and Distribution Program emphasizes systematic analysis for cost reduction and control within an organization while increasing customer service and strengthening market position through a more effective distribution system.

Transportation and Distribution students study both the "buying" (distribution and management) of a service for the movement of

goods and people, and the "selling" or supplying of transportation facilities for the movement of goods — within Canada, or to and from Canada.

Job Opportunities

Transportation and Distribution graduates become involved with the buying and selling of transportation services and can choose from a variety of dynamic, highly paid management careers in marine shipping, airlines, railroads, trading, customs broking, freight forwarding, poolcar operating, manufacturing, etc.

INTERNATIONAL TRADE OPTION

To complement Canada's export drive, this option was created to supply industry with the skilled personnel needed to perform technical tasks to research new markets, their regulations and restrictions, and to negotiate improved rates for cost-effective transportation, tariff classification, documentation, banking, collections, etc.

Students of the International Trade option are trained in foreign market research to develop and sustain demand for Canadian products abroad. Studies in Geography of Trading, International Economics, Purchasing and International Law and Finance enable graduates to adapt to rapidly changing conditions in foreign exchange, non-tariff barriers, the use of Free Trade zones, etc. Extensive training in logistics, transportation economics and regulation/deregulation allows graduates to deal effectively with problems arising from alternative routing, freight consolidation and intermodalism.

Job Opportunities

International Trade graduates can immediately contribute to the profitability of the employer while learning about the commodity involved.

Because of the versatility of this technical training, graduates are suited to a variety of positions with trading houses, exporting manufacturers, importers, customs brokers, foreign freight forwarders, etc., leading to highly paid management careers.

Prerequisites

Algebra 11 with a C+. This requirement may be waived for mature students on approval by the Department Head. If your mathematical skills are in doubt, it is recommended that you take Preparatory Business Math OPMT 099. It is also recommended that potential students acquire basic typing skills due to the extensive use of computer input terminals in the program.

PROGRAM: Transportation/Distribution and International Trade Option

		Clim hrs/wk
Level 1		
ADMN 100	Micro Economics.....	3.0
ADMN 385	Business Law	3.0
BCOM 107	Business Communication for Operations Management	3.0
COMP 100	Data Processing — Introduction	4.0
FGMT 102	Introduction to Financial Accounting.....	3.0
MKTG 102	Introduction to Marketing	3.0
OPMT 101	Business Mathematics.....	5.0
OPMT 150	Introduction to Microcomputers	2.0
TDMT 101	Geography of Trading 1	3.0

		Clim hrs/wk	
Level 2		2A	2B
ADMN 200	Macro Economics	3.0	3.0
BCOM 207	Business Communication for Operations Management	3.0	3.0
FMGT 202	Introduction to Financial Accounting	3.0	3.0
MKTG 103	Sales Skills	3.0	3.0
OPMT 121	Business Statistics	4.0	4.0
OPMT 241	Systems Analysis and Design	3.0	3.0
OPMT 250	Computer Programming Applied BASIC	3.0	3.0
TDMT 100	Transportation Methods	4.0	0.0
TDMT 201	Geography of Trading 2	0.0	4.0
TDMT 204	Integrated Purchasing	3.0	3.0

PROGRAM: Transportation/Distribution

Level 3			
ADMN 382	International Law	3.0	
OPMT 143	Management Engineering	4.0	
OPMT 301	Quantitative Methods/Computer Applications	3.0	
OPMT 350	Computers and Information Processing 1 .	3.0	
TDMT 202	Transportation Regulations	4.0	
TDMT 203	Transportation Economics	4.0	
TDMT 305	International Trade	4.0	
TDMT 306	Transportation Marketing	3.0	
TDMT 309	Marine Shipping and Insurance	3.0	
Level 4		4A	4B
ADMN 331	Industrial Relations	4.0	0.0
ADMN 340	Personnel Administration	2.0	0.0
FMGT 442	Domestic and International Corporate Finance	3.0	3.0
OPTM 156	Supervision	0.0	4.0
OPMT 401	Quantitative Methods/Computer Applications 2	2.0	0.0
OPMT 445	Quality Assurance (Services)	2.0	0.0
TDMT 307	Traffic Management	4.0	0.0
TDMT 308	Transportation Management	4.0	0.0
TDMT 409	Exporting and Importing	2.0	2.0
TDMT 410	Logistics	4.0	4.0
TDMT 411	Industry Project	0.0	15.0
TDMT 414	Manufacturing Methods	0.0	2.0
TDMT 420	Customer Analysis	3.0	0.0

PROGRAM: International Trade Option

Level 3			
ADMN 382	International Law	3.0	
MKTG 309	Marketing Research 1	4.0	
OPMT 350	Computers and Information Processing 1 .	3.0	
OPMT 401	Quantitative Methods/Computer Applications 2	3.0	
TDMT 202	Transportation Regulations	4.0	
TDMT 203	Transportation Economics	4.0	
TDMT 305	International Trade	4.0	
TDMT 306	Transportation Marketing	3.0	
TDMT 309	Marine Shipping and Insurance	3.0	
Level 4		4A	4B
ADMN 340	Personnel Administration	2.0	0.0
ADMN 331	Industrial Relations	4.0	0.0
FMGT 442	Domestic and International Corporate Finance	3.0	3.0
MKTG 401	Marketing Planning	4.0	4.0
MKTG 409	Marketing Research 2	3.0	3.0

		Clim hrs/wk	
		2A	2B
OPMT 156	Supervision	2.0	2.0
OPMT 446	Quality Assurance (International)	2.0	0.0
TDMT 307	Traffic Management	4.0	0.0
TDMT 409	Exporting/Importing	2.0	2.0
TDMT 410	Logistics	4.0	4.0
TDMT 411	Industry Project	0.0	12.0

Course Descriptions

ADMN 100 Micro Economics — The major areas studied are the product and resource markets. Students analyze supply and demand, how production costs vary and how prices are determined in various market structures. In addition, resource allocation and economic policy implications are explored.

ADMN 200 Macro Economics — Develops understanding of the organization and operation of the Canadian Economy in an international setting. The theoretical tools of the economist are used to expand the concepts of national income employment, inflation, money and banking international trade, and growth. An appreciation of the relationship between economic theory and economic policy is provided.

ADMN 221 Organizational Behavior Fundamentals — Studies human behavior and attitudes in an organizational setting; the organization's effect on the person's perceptions, feelings and actions; and the person's effect on the organization, particularly how behavior affects the achievement of the organization's purposes. Concepts of leadership, communications, power, authority, change and conflict will be examined.

ADMN 330 Industrial Relations — A detailed analysis of selected labor/management problem areas with emphasis on the solution of practical problems in industrial relations.

ADMN 331 Industrial Relations — An introductory analysis of the fundamental issues and facts of labor-management relations. Special emphasis is given to collective agreement content and interpretation, bargaining and basic labor economics.

ADMN 340 Personnel Administration — An introduction to the fundamentals of personnel management, including organization of the personnel function, salary administration, fringe benefits, training, management development and performance appraisal, constructive discipline, grievances and morale.

ADMN 343 Personnel Fundamentals — An introduction to the fundamentals of personnel management, including human resource planning; recruiting and selection techniques; job analysis, descriptions and evaluation; compensation administration; performance appraisal systems; training; employee safety and health. Includes a review of current employment legislation.

ADMN 382 International Law — This course will examine conflicts of law, international sale of goods contracts, international arbitration, etc. Provides the student with an overview of central legal issues which arise from conducting business across national boundaries.

ADMN 385 Business Law — A one-term, condensed course which acquaints the business student with basic knowledge of Canadian law including the legal system, contracts, torts, sale of goods and consumer protection, secured transactions and creditors' remedies, employment law and agency, business organizations, negotiable instruments, real estate and administrative law.

BCOM 107 Business Communication for Operations Management — An applied communication course for Operations Management students. It covers the basic writing and oral communication skills necessary in business and industry. Students learn how to write effective letters and memos and how to prepare and make oral presentations. The course also includes a unit on using word processors.

BCOM 207 Business Communication for Operations Management — Gives further instruction and practice in the skills learned in BCOM 107. In this term, the focus is on job application, functional reports, telephone techniques and meetings. Prerequisite: BCOM 107.

CHSC 122 Engineering Concepts — Examines comparative properties of all classes of engineering materials including metals, alloys, polymers, concrete wood and ceramics. Common causes of failure in service including fatigue, weathering, embrittlement and corrosion.

COMP 100 Data Processing — Introduction — Training in basic data processing principles to develop recognition of the application of these principles to industry. The principal functions of data processing are illustrated and practised with an H.P. minicomputer operating interactively. Elementary computer programs are written and tested on the computer. Use of flow-charting and elementary data processing systems design will illustrate the achievement of data processing objectives.

FMGT 102 Introduction to Financial Accounting — Includes a survey of the accounting process and a review of basic accounting theory. Preparation and analysis of financial statements and the reporting of financial information to outsiders is covered in depth. Also covered is accounting for assets, liabilities and owner's equity.

FMGT 202 Introduction to Financial Accounting — Covers the preparation and utilization of financial information for internal management purposes. Volume-profit analysis, capital budgeting, depreciation, return on investment, budgeting systems, common dollar accounting and funds flow analysis will also be considered. Prerequisite: FMGT 201.

FMGT 306 Cost Accounting — Operations Management — Concentrates specifically on cost accounting for operations management. Topics will include basic cost concepts, systems of cost accumulation, accounting for manufacturing overhead, standard cost systems and the analysis of cost variances. Variable costing is also dealt with. Prerequisite: FMGT 201 or 215.

FMGT 442 Domestic and International Corporate Finance — Familiarizes students with the role finance plays in business and industry. Students will obtain a basic understanding of the interrelationships of finance with the other functional aspects of business. Teaches students common decision-making tools in finance to enable them to react intelligently under varying conditions within a business environment of ever-increasing complexity. Special emphasis will be given to the services provided by financial institutions to firms that take part in international trade.

MECH 102 Drafting — Introduces students to engineering drawings as a method of communication. Students will learn how to read various types of blueprints and how to communicate using drawings. Emphasis is on visualization, dimensioning and free-hand sketching.

MECH 207 Engineering Concepts — Through lectures and laboratory investigations, the course covers the basics of many manufacturing processes such as welding, brazing, soldering;

metal removal on lathes, milling and grinding machines; computer numerical controlled machine tools.

MKTG 102 Introduction to Marketing — Includes a detailed study of the basic marketing functions, marketing research, product planning, selection of trade channels, merchandising, advertising, sales promotion and salesmanship. Marketing of consumer goods as well as industrial goods will also be covered.

MKTG 103 Sales Skills — Introduction to professional selling. Emphasizes practical problems of locating and qualifying prospects, use of depth approach and improving sales preparation and organization. Examines improving interpersonal communications in non-selling situations.

MKTG 301 Quantitative Methods/Computer Applications in Marketing — An examination of decision support systems now available utilizing mathematical modelling methods, data bank access, and computer based information. Prerequisite: MKTG 101, 201.

MKTG 309 Marketing Research 1 — Examines the basic approaches to marketing research. It discusses the techniques and tools of this research and relates these tools to the decision-making process. Emphasis is placed on the use of marketing research in the total marketing decision concept. Special applications of marketing research to simulated real-life situations are examined. Prerequisite: MKTG 101, 201.

MKTG 401 Marketing Planning — Examines how to develop a formal marketing plan including situation analysis, market and competitive conditions research, objective setting and action scheduling using computer based management systems. Prerequisite: MKTG 100, 200.

MKTG 409 Marketing Research 2 — see MKTG 309. Prerequisite: MKTG 309.

OPMT 100 Applied Mathematics 1 — Covers basic mathematics applied to industry and commerce. Topics include basic algebra, trigonometry, break-even analysis, simple and compound interest, annuities and methods of evaluating alternatives in industrial investments.

OPMT 101 Business Mathematics — Covers the basic mathematics applied to industry and commerce. Topics include basic algebra, break-even analysis, simple and compound interest, annuities, and methods of evaluating investments in business.

OPMT 120 Applied Mathematics 2 — Covers fundamental statistics used in business and industry. Topics include descriptive statistics, probability theory and major distributions, sampling, confidence intervals, tests of hypotheses, applications to quality control, correlation and linear regression.

OPMT 121 Business Statistics — Covers fundamental statistics used in business and industry. Topics include descriptive statistics, probability theory and major distributions, sampling, estimation, tests of hypotheses, correlation and linear regression.

OPMT 140 Introduction to Operations Management — Provides an introduction to the role of business in the British Columbia economy. It considers the management of business and emphasises the types of careers available to Operations Management graduates in B.C. business.

OPMT 143 Management Engineering — A basic productivity engineering course for transportation and distribution students. Course covers the basic industrial engineering approach to productivity improvement including work measurement and facility layout. Examples and projects are oriented to the TND side of the economy.

OPMT 150 Microcomputer Applications — An introduction to the role of personal computers in business. Emphasis is on learning to use a standard integrated software product for word processing, financial modelling (spreadsheet), and file management (data base).

OPMT 156 Supervision — Introduces the student to some of the skills required to survive the initial period of promotion to a first line supervisory position. Topics include role of the supervisor, functions of management, authority relationships, design and implementation of "on the job training" programs, how to lead, delegate, discipline and evaluate, as well as dealing with day to day operations including grievances.

OPMT 157 Marketing Research — Designed to give the student a basic appreciation of marketing functions and the role of market research in an organization.

OPMT 160 Method Study 1 — This introductory course in industrial engineering presents a six step systematic approach to methods improvement. The student will learn specific industrial engineering techniques.

OPMT 240 Industrial Engineering — Builds on OPMT 160 to provide the student with a comprehensive knowledge of industrial engineering techniques to solve problems in an industrial setting. Topics include applied method study, feasibility studies, systematic layout planning and computerized layout planning.

OPMT 241 Systems Analysis and Design — In business, systems analysis and design refers to the process of examining a business situation with the intent of improving it through better procedures and methods. The course includes: problem definition, the project proposal, procedure analysis, forms and reports analysis, interviewing, system design, procedure and writing implementation planning.

OPMT 244 Performance Measurement — Designed to provide the student with an appreciation of work measurement in an industrial setting. Topics include performance rating, time study and predetermined motion time systems such as M.T.M. 2, M.O.S.T. and computerized M.O.S.T.

OPMT 245 Quality Assurance (Manufacturing) — Modern concepts of quality management for the manufacturing industries. Topics include inspection, quality control and quality assurance; organization; quality system functions and documentation requirements; technical, economic and legal aspects of quality assurance management; supplier quality assurance; product reliability; Canadian national standards for quality programs.

OPMT 250 Computer Programming — Applied BASIC — This second level course involves the use of advanced BASIC to solve problems which are related to the Operations Management field. Topics include arithmetical operations, input/output, branching, looping, arrays, random numbers, sorting, strings, subroutines, functions, and files.

OPMT 251 Systems Analysis and Design — In business, systems analysis and design refers to the process of examining a business situation with the intent of improving it through better procedures and methods. The course includes: the system cycle, fact finding, documentation of systems, feasibility studies, forms and report analysis, procedure writing, computer input/output, auxiliary storage devices and file and data base development.

OPMT 300 Quantitative Methods 1 — Applications of mathematical and computer modelling to decision-making in business and industry. Topics include model building, break-even analysis, decision theory, decision support systems, linear program-

ming, queuing theory, simulation models, demand analysis and computer applications (main-frame, mini and micro).

OPMT 301 Quantitative Methods/Computer Applications — Following basic training in mathematics of finance and statistics, students are introduced to the solution of more complex business problems by mathematical processes. Forecasting methods are examined with computerized analysis of data. Some aspects of management science that are particularly useful in the transportation business are examined manually and through the computer. These include linear programming, the transportation model, simulation, and waiting line analysis. The major emphasis is in interpretation of results and preparation of management oriented reports.

OPMT 340 Applied Industrial Engineering 1 — Enables the student to understand the role of manufacturing automation in the productivity improvement process including CAD/CAM and robots. The concepts of flexible manufacturing systems, group technology and computer integrated manufacturing are explored.

OPMT 348 Production and Inventory Management 1 — The emphasis of this course and the continuing course (OPMT 448) is on practical material which can be used with little modification in production or operating environments. The course presents much of the material contained in two of the five exams leading to the professional certification of CPIM (Certificate in Production and Inventory Management). The two exams are Inventory Management and Master Planning. Project planning and scheduling is also covered.

OPMT 350 Computers and Information Processing — Continuation of OPMT 241. The first half of the course covers the process of building a data base application with a commercial data base manager called R-base 5000. The material focuses on the EXPRESS module of the R-base packages which enables quick development of data base applications. The second half of the course features a major case study that requires students to analyze and design a computer based information system for a small business.

OPMT 351 Microcomputer Data Base Processing — Continuation of OPMT 251. This course covers the process of building data bases and data base applications with a commercial data base manager called R-base 5000. Much of the course is generic in nature and many of the techniques, functions and procedures are applicable to other relational data base software packages for microcomputers.

OPMT 400 Quantitative Methods 2 — see OPMT 300. Prerequisite: OPMT 300.

OPMT 401 Quantitative Methods/Computer Applications 2 — A continuation of OPMT 301 with discussions on inventory control methods and network techniques.

OPMT 440 Applied Industrial Engineering 2 — This course is divided into four separate study areas.

1. Presentation to the board: Specific oral presentation design and delivery. This course is intended as practice for fourth term projects.
2. Introduction to industrial health and safety: Introduction to safety and accident prevention, accident report writing, safety in the workplace.
3. Introduction to materials handling: Basic uses and applications of conveyors, trucks and cranes.

4. Mini projects: In preparation for fourth term projects, students are required to negotiate a management level project of their own choosing within BCIT. Students are required to develop working terms of reference with BCIT staff and faculty and complete the project consistent with the terms of reference.

OPMT 445 Quality Assurance (Services) — Quality Assurance related to transportation and distribution services. Topics include: QA fundamentals for service industries; quality control planning for operating equipment and goods in transit; measurement of service quality; QA support for procurement and the evaluation of suppliers; quality management programs and their effect on business performance and trading opportunities.

OPMT 446 Quality Assurance (International) — The impact of quality assurance on business activity in the international market. Topics include: QA fundamentals; North American, European and Japanese standards for quality programs; international product certification; national-level planning for quality control in Pacific Rim countries; ISO standards for quality management systems and their effect on international procurement, cooperation and competition.

OPMT 448 Production and Inventory Management 2 — A continuation of OPMT 348. This course presents much of the material contained in the three exams — material requirements planning, capacity requirements planning and production activity control which lead to the professional designation CPIM (Certificate in Production and Inventory Management).

OPMT 449 Industrial Engineering Concepts — The operations management technology of BCIT requires that each of its second year students successfully conduct and complete a problem solving study in an organization external to BCIT. Students must select and define, in conjunction with staff advisors and management contacts, a management problem to be solved. Within the bounds of management/student drafted and agreed to terms of reference, students must demonstrate their ability to apply learned skills to successfully conclude a practical problem-solving laboratory. At the end of the study period, students are required to supply management and BCIT staff with a formal technical report containing firm recommendations and an oral presentation to management and staff outlining the study finding and recommendations.

OPMT 450 Computer and Information Processing 2 — Continuance of OPMT 351. This course features a major case study that requires students to analyze and design a computer based information system for a small business. It has been designed to supplement and integrate educational material covered in five prerequisite courses (Introduction to Data Processing, Introduction to Microcomputers, Applied BASIC, Systems Analysis and Microcomputer Data Base Processing). Topics include: auxiliary storage devices, hardware and software selection, operating systems, the request for proposal process, and selection of software package.

PHYS 117 Basic Science for Operations Management — A survey course which covers topics of physics as they relate to the operations management technology. A brief chemistry component facilitates the study of handling and storage of hazardous materials. Emphasis is on how the basic laws of physical science affect and limit activities in the technology.

PHYS 217 Basic Science for Operations Management — see PHYS 117.

TDMT 100 Transportation Methods — Introduces students to the various ways of moving commodities, including air, highway, pipeline, rail and water carriers. Economic costs of operation and selection of equipment are also covered.

TDMT 101 Geography of Trading 1 — Transportation is the basis of all economic systems including agricultural production, industrial location, settlement patterns, marketing systems and consumer shopping. This course studies in detail the role of transportation, major trading routes and ports and other factors in the development of resources for the world and Canada. Emphasis is placed on Canada as a major resource producer, particularly in the emerging Pacific Rim.

TDMT 201 Geography of Trading 2 — Designed to give students a basic understanding of world resource industries — agriculture, raw materials, energy sources as well as the flow of commodities, trade routes, trading patterns and the degree of inter-dependence among the nations. As well, the course will cover the characteristic of each mode of transport on the six continents. Prerequisite to International Trading Strategies.

TDMT 202 Transportation Regulations — Familiarizes the student with transportation regulations at federal, provincial, and regional levels. The Acts governing intra and inter-provincial transportation, and regulation of common, contract and private carriers, including their rights and responsibilities, and the deregulated U.S. transportation industry.

TDMT 203 Transportation Economics — Covers a variety of transportation services and their cost factors including carrying capacity, load factors, fuel cost, etc., concluding with profit oriented rate making. Costing methods relating to various modes of transportation are discussed considering distance, flow of goods and backhaul.

TDMT 204 Integrated Purchasing — Acquaints the student with purchasing principles and methods using computerized techniques. Methods of buying transportation services are covered. Emphasis is on computer assisted analysis of PARETO's law including vendor evaluation and contracting methods for A, B, C items categories. Course also includes advanced application of the EOQ formulae taking turnover into consideration on three levels; vendor-firm-customer, geographic-freight-consolidation, and cost-saving-results. Elements of material management, customer services, performance standards, computerized measures emphasize goods-in-transit manipulation to avoid stockouts. The basic components of cost trade-offs through special quantitative case studies are also covered.

TDMT 305 International Trade — To develop an understanding of international logistics, this course deals with the economic and trading characteristics of nations as they relate to the Canadian economy. An overview of comparative advantage and disadvantage introduces the student to the protectionism and intricacies of international trading. INCO terms and pricing, floating and pegged exchange rates will be discussed together with the movement of international inventories. The course also covers information on counter trade. Prerequisite to Import/Export. Prerequisite: TDMT 201.

TDMT 306 Transportation Marketing — The student learns to relate the services of a transportation company to client requirements. The increasing impact of intermodalism is examined while the student develops the ability to analyse the competitive position of his carrier (employer), to assure effective participation in the market.

TDMT 307 Traffic Management — Acquaints the student with the broad responsibilities of a traffic manager in an industry requiring transportation services. Includes negotiating with common carriers, criteria for carrier selection, rate negotiations, routing, consolidation, documentation, handling claims, tracing, expediting and carrier performance analysis for future carrier selection.

TDMT 308 Transportation Management — The operation departments of a transportation company are described in detail. Freight tariffs as applicable to commodity, special and ancillary services, routing, misrouting, claim prevention, and the organization and control of the company are examined.

TMDT 309 Marine Shipping and Insurance — This course is designed to familiarize the student with the basics of the principles and problems of ships, navigation and cargo, trends in shipping, containerization/unitization and the port as a sea transport interface. Marine Insurance will deal with the types of policies, the fundamentals of coverage, the analysis of the policy and claim handling.

TDMT 409 Exporting/Importing — Practical application of previously learned theories acquaints students with the terminology and interpretation of the Customs Act, customs tariff, excise tax, and Antidumping Act. Gives the student thorough understanding of fair market value, dumping, countervailing duty, the GATT, tariffs and the increasing use of non-tariff barriers including present new devices. Documentation for importing and exporting, entries, drawbacks, refunds, appeals and classification is covered.

TDMT 410 Logistics — An overview of the total distribution concept. Adding to previously learned information the course examines distribution facility location analysis, information systems, control systems and distribution economics and profitability. With heavy emphasis on customer services and profitability, the course prepares the student to conduct a transportation audit, customer service audit and a complete distribution audit.

TMDT 411 Industry Project — The course is an opportunity to apply the knowledge from the program to a specific industry project at the client's place of business.

TDMT 414 Manufacturing Methods — A study of the processes involved in the making of consumables. Physical, chemical and electrical principles are reviewed with special emphasis on the handling, care and disposal of hazardous products.

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