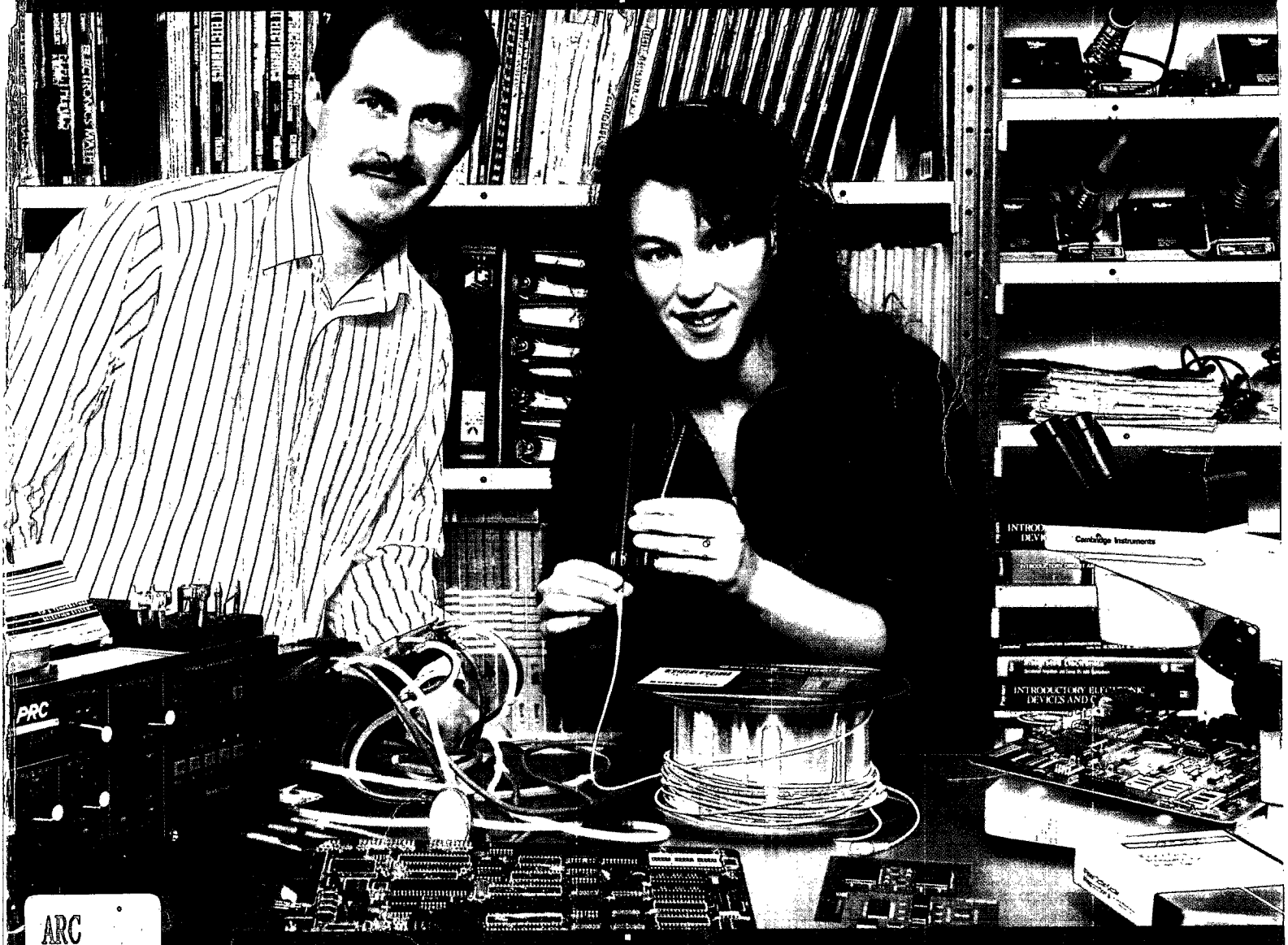
BCIT

FULL-TIME PROGRAMS



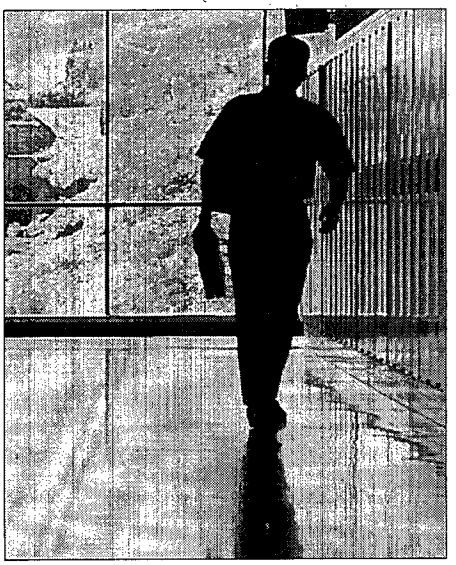
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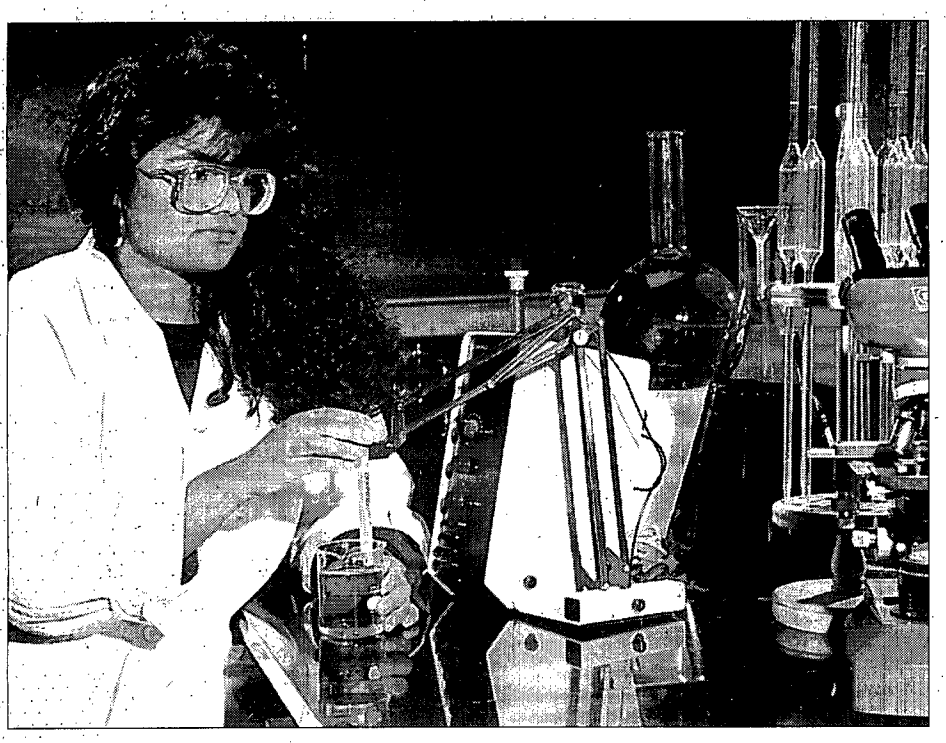
THE BCIT MANDATE

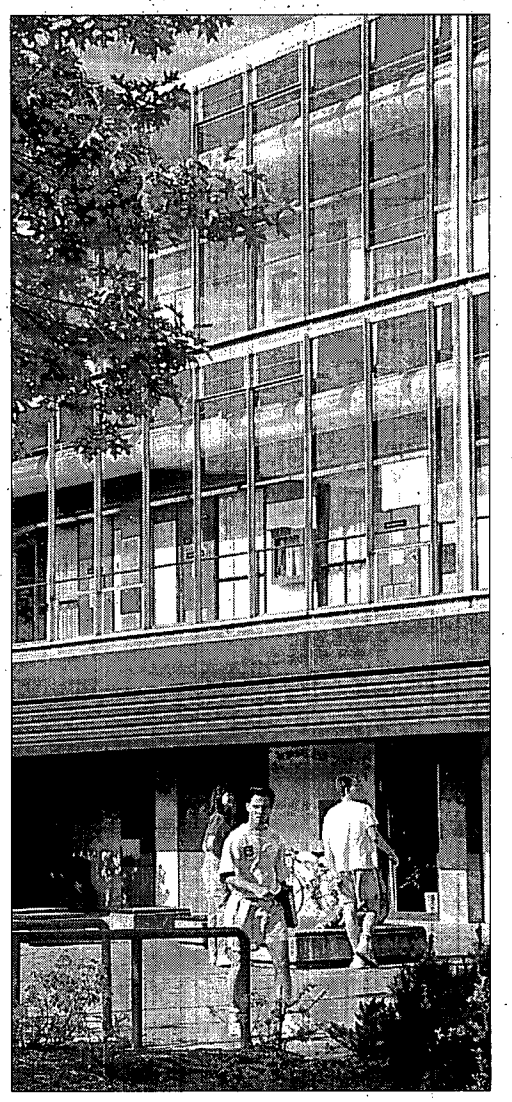
The British Columbia Institute of Technology will be an innovative and flexible advanced technology enterprise which will focus on those initiatives that increase the level of entrepreneurial activity within the province.

1994/95
c. 6

Specifically BCIT will:

- establish expertise in specific technological areas and develop applications for British Columbia business and industry;
- facilitate technology transfer by providing innovation, industrial assistance and contracted applied research; and
- provide a highly trained workforce vital to the establishment and continuance of advanced technology in British Columbia.





◀ *Cover photo: Telecommunications instructor Terry Knudson and Sandra Zustovic use a microscope to test fibre optic connectors.*

LIBRARY
B.C. INSTITUTE OF TECHNOLOGY
3700 WILLINGDON AVE.
BURNABY, B.C.
V5G 3H2



MESSAGE FROM THE PRESIDENT

At BCIT we are proud of our success in preparing first-class graduates for B.C.'s leading industries. The reputation of our job-ready grads is a trademark that prevails whatever program you decide to choose.

At BCIT we focus on quality. In your review of the calendar you will find current programs taught by highly motivated educators who are also up-to-date in their fields. Our successful formula blends a traditional focus on theory with an emphasis on practical career-oriented instruction, to ensure you have the tools to succeed.

Our faculty, support staff and management are committed to ensuring that your education at BCIT is both challenging and rewarding. I wish you every success in the years to come.

John Watson
President

CHANGES TO CURRICULA, REGULATIONS AND SERVICES

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 the programs of study, services or regulations. The Institute reserves the right to cancel any program or service.

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194/ CNC Programmer
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Architectural Design
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198/ Heavy Duty Mechanic
198/ Inboard/Outboard Mechanic
199/ Industrial Maintenance Mechanic
200/ Ironworking
200/ Joinery (Cabinetmaker)
201/ Machinist
201/ Millwright
202/ Motorcycle Mechanic
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GENERAL INFORMATION

CLASS LOCATIONS/OFFICE HOURS

1. **Burnaby, Main Campus (Bby)**
   434-5734
   3700 Willingdon Avenue
   Burnaby, B.C.
   V5G 3H2

Full-time and Part-time courses and programs.
Admission: Full-time programs: ...432-8419
Application Forms/
Program Information:.....434-3304
Registration: Part-time 434-1610
Registration: Fax 430-1331
Student Records:.....432-8498
Refunds:.....432-8212
Payments: 434-8732

Office Hours
Admission/Registration/General Enquiries
July 11/94 to August 13/94:
0830—1630, Monday to Friday
Closed Saturday.

August 15/94 to July 8/95:
0830—1900, Monday to Thursday
0830—1630, Friday
0830—1230, Saturday
Closed on holiday weekends.

2. **Downtown**
   Education Centre (DEC)
   687-4666
   549 Howe Street
   Vancouver, B.C.
   V3C 2C6
   Fax: 687-2488

Office Hours
When school is in session:
0830—1800, Monday to Thursday
0830—1630, Friday
Otherwise
0830—1730, Monday to Thursday.

3. **Kaslo Campus (KAS)**
   439-4100
   2780 East Broadway
   Vancouver, B.C.
   V5M 1Y8
   Fax: 251-2008
   Health part-time classroom courses only.

4. **Sea Island (SEA)**
   278-4831
   Vancouver International Airport
   5301 Airport Road, South
   Richmond, B.C.
   V7B 1B5
   Fax: 278-5363
   Full-time and part-time Aviation courses and programs only.

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
0600-8:00	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	

PERSONAL DATA

It is the student's responsibility to ensure that all personal data on file is accurate. All address changes, name changes, etc., must be reported in writing to Registration at the Burnaby Campus or Downtown Education Centre.

REFUND DEADLINE

It is the student's responsibility to check the refund deadline dates in this calendar. Please see refund section on page 21. This information can also be obtained from Registration or the Cashier, ground floor SW1 Building.

AIDS POLICY

It is the policy of BCIT that there shall be no discrimination against any person at BCIT known or suspected to have AIDS, or to be infected with HIV (AIDS virus). While BCIT's policy does not require mandatory testing for AIDS, it should be recognized that BCIT has no control over the policies of external agencies employing BCIT students and/or graduates.

DISABLED ACCESS

BCIT is committed to providing students with disabilities with equal opportunity to maximize their potential in our educational setting.

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. The Institute is committed to create and maintain an environment that is conducive to learning. In doing so, students are expected to conduct themselves appropriately at all times, respecting other's rights, property, environment, health and safety, and are held responsible for their individual and collective actions.

   An instructor who believes a student's conduct in the classroom is detrimental to the course goals, objectives and learning outcomes, may assign the student a failing grade for the course. For misconduct outside the classroom, the Dean may recommend to the President suspension from further attendance. The President has the final power to suspend or expel a student for disciplinary reasons. A student expelled or suspended for misconduct will not be permitted on Institute grounds or buildings.

2. Honesty is expected and required of all students. This implies fairness, straight forwardness of conduct, academic integrity, adherence to the facts and trustworthiness. Acts of cheating, plagiarism and dishonesty are not tolerated; the degree of punitive action may range from a written warning to expulsion from the Institute. These penalties may also be applied to students who knowingly contribute to the act of dishonesty, cheating and plagiarism.

   Definitions

   2.1 ***Cheating***: means to knowingly violate rules designed to ensure academic honesty and includes, but is not limited to:
   (a) the copying or other use by one person of another person's work during an examination, test, or other form of assessment;
   (b) the unauthorized use of materials or information whether physically or electronically stored during an examination, test, or other form of assessment;
   (c) the bringing into an examination, test, or other form of assessment any unauthorized information or materials and having ready access to same.

   2.2 ***Plagiarism***: means the presentation by a student of materials or work prepared by another person or persons, as the student's own work and without reference credits. It includes, but is not limited to:
   (a) literary theft;
   (b) presenting as new and original an idea or product derived from an existing source;
   (c) failing to expressly acknowledge research or preparation conducted in whole or in part in respect of a term paper, project, report, or other form of assessment other than the student claiming authorship to the term paper, project report or other form of assessment.

2.3 Dishonesty: includes, but is not limited to, any unauthorized action or conduct of a student in a clinical, industry or laboratory work situation where the student allows other person(s) to complete his or her tasks and fails to report or explain same to his or her supervisor or instructor.

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, students may be required to wear uniforms or otherwise dress themselves 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.

ATTENDANCE POLICY

Regular attendance in lectures, seminars, labs, clinical and shop periods, is seen as critical to student success, and will be monitored by faculty. Excessive absence may result in failure or immediate withdrawal from the course or program.

Student Responsibility

1. In case of illness or other unavoidable cause of absence, or lateness, students must communicate as soon as possible with their Program Head or Chief Instructor, indicating the reason for absence. Failing to give an unacceptable reason for being absent or late will result in the student having an "unexcused absence" for that day.

2. Prolonged illness of three or more consecutive days must have a doctor's certificate sent to the Program Head or Chief Instructor substantiating the absence. Failure to provide a certificate will result in these absences being unexcused.

The following guidelines give the normal conditions whereby students may be prohibited from completing their program or courses.

Trade Programs

1. Students who fail to report absences of three or more days to departments.

2. Students who are absent for any cause, for more than 10% of the course/program.

3. Students who are late for any cause on an average of more than once per month.

Technology Programs

Students who are absent for any cause, other than substantiated illness, for more than 10% of the time prescribed for the course/program.

Special Regulations

In certain programs/courses, special regulations may apply governing attendance; these will be stated in the course outline.

Appeals

Students may appeal the decision through the normal academic channels. For more details on appeal procedures, please contact the Registrar's Office at 432-8848.

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 password 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 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.

c) 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.

d) 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.

BOARD OF GOVERNORS

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Vice Chair
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Gary Birch, Ph.D., Richmond
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Norman Streat, B.Sc.Eng., Ph.D., Director, Technology Centre
Jacqueline Hurst, B.Sc., M.D., Acting Director, Medical Services
Catherine Daminato, Director of Development

OFFICE OF THE REGISTRAR

The Office of the Registrar is located in building SW1 on the first floor, facing Willingdon Avenue.

Mario Mazziotti, Dipl.T., B.Sc., Registrar
Jeri Fostvelt, Associate Registrar
Michelle Philippe, B.Sc., Dipl. T., Systems Coordinator

Admissions/Registration

432-8419	Full-time Admission/ Status Information
434-3304	Admission Forms and Program/ Course Information
434-1610	Part-time Registration
430-1331	Registration Fax

Admissions/Registration receives and processes all applications for full-time programs and part-time courses. Registration for part-time courses can be made by phone, in person, by FAX or mail. PLEASE NOTE: First time registrants for part-time studies courses cannot register over the phone. Enquiries for program information, application forms and/or publication requests should be directed to Student Services at 434-3304. Enquiries from outside the greater Vancouver area may use the Toll Free Number 1-800-667-0676.

Office hours are:
0830—1900, Monday to Thursday
0830—1630, Friday
0830—1230, Saturday
Closed on holiday weekends

Summer: July 11/94 to August 13/94
0830—1630, Monday to Friday
Closed Saturday
Please see our advertising supplements (flyers) for specific dates.

Lois Nightingale, B. Com., Supervisor
General enquiries: 434-1610
Application and program information requests: 434-3304

Student Records 432-8498

The following services are provided by the Student Records Department:
1. BCIT transcript requests
2. Verification of attendance at BCIT
3. Course credit evaluation
4. Graduation eligibility
5. Certificate/Diploma processing
6. Student information changes (address, name, etc.)
7. Dayschool course-by-course registration. Office hours are 0830—1630, Monday to Friday.

Susan Morphet, B.A., Supervisor
Rosa Kajic, Part-time Studies Marks Assistant: 432-8276
General enquiries: 432-8498

Timetabling

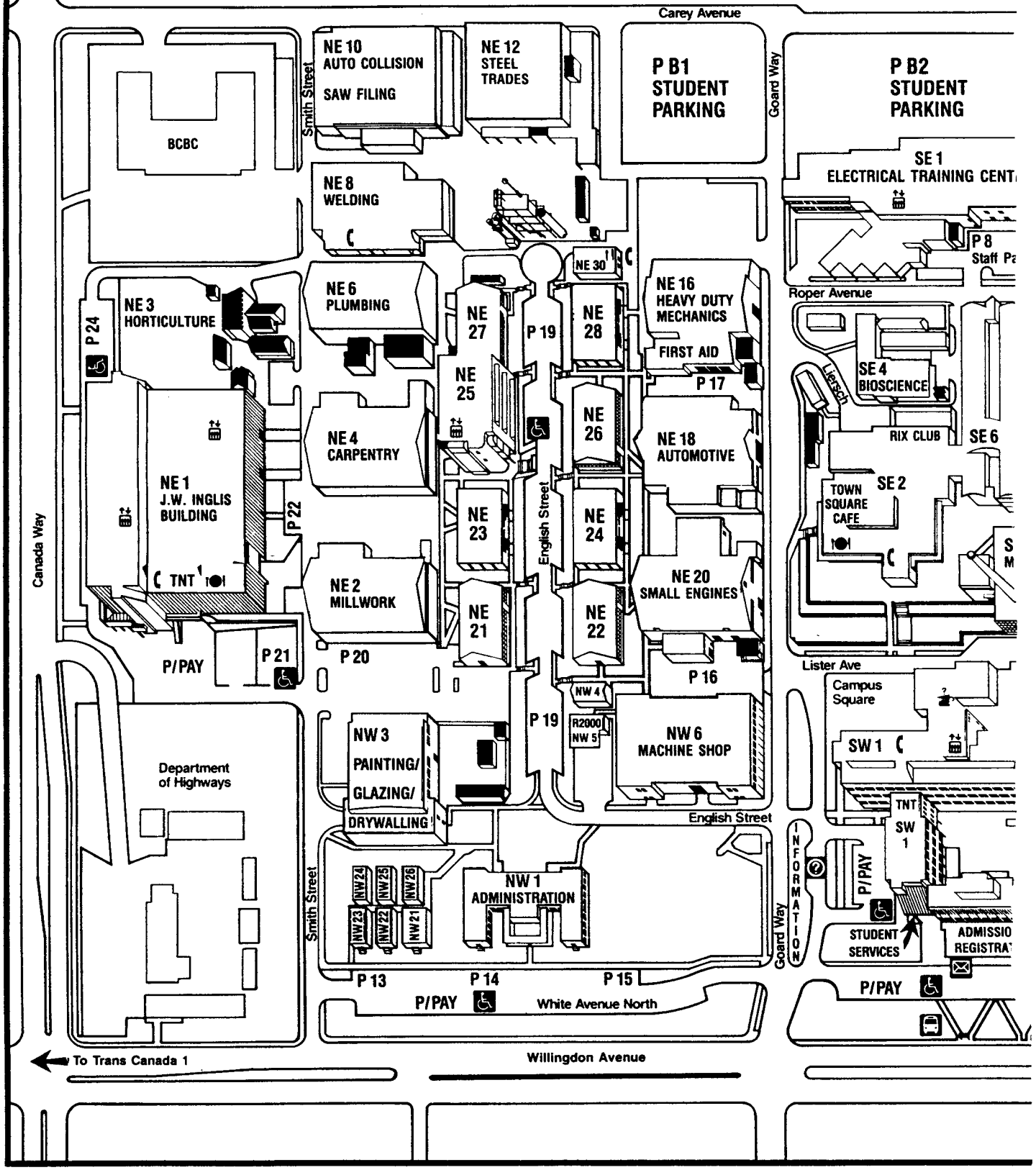
The Timetabling Department produces the Institute's master timetables for all full-time and part-time programs and full-time technology examinations.

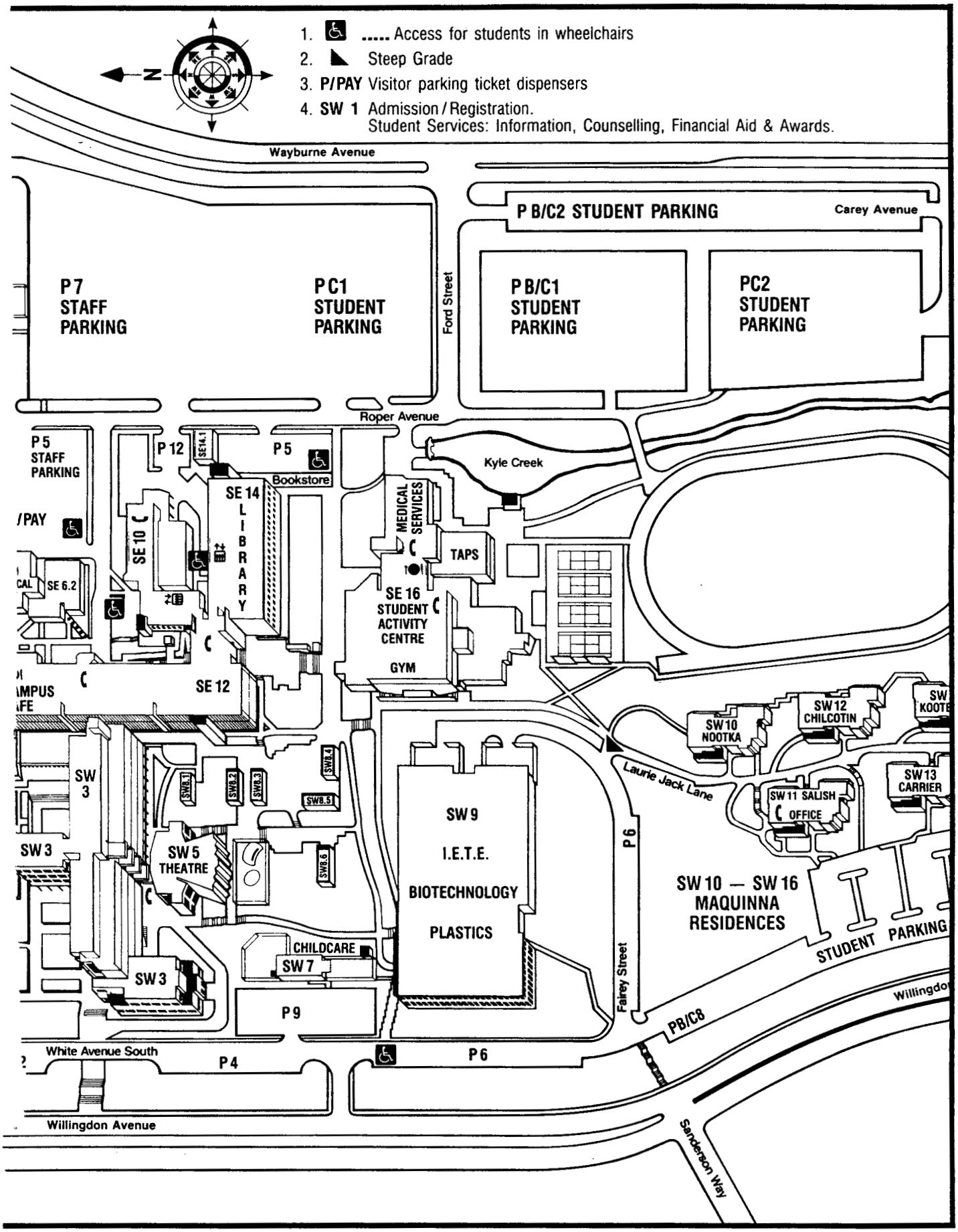
Requests to use campus facilities by external users should be directed here.
George Brown, Supervisor
General enquiries: 432-8451
Fax: 435-0928
Office Hours are 08:30—16:30

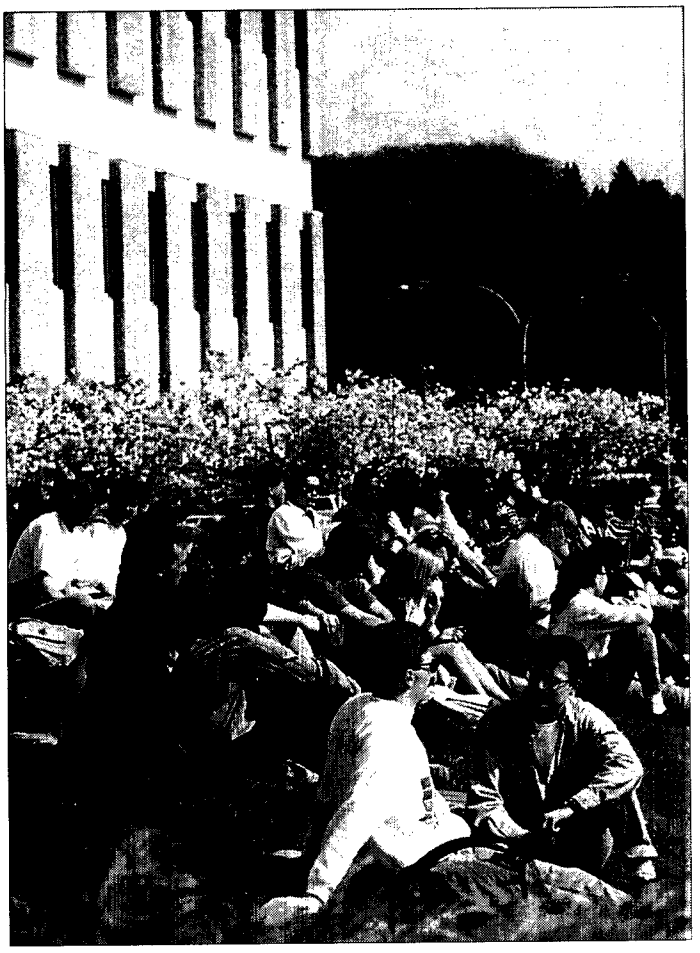
BURNABY CAMPUS

3700 Willingdon Avenue
Burnaby, B.C. Canada
V5G 3H2

Published August 1992




1. ..... Access for students in wheelchairs
2. Steep Grade
3. P/PAY Visitor parking ticket dispensers
4. SW 1 Admission / Registration.
Student Services: Information, Counselling, Financial Aid & Awards.
N
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P B/C2 STUDENT PARKING
Carey Avenue
P7 STAFF PARKING
PC1 STUDENT PARKING
Ford Street
P B/C1 STUDENT PARKING
PC2 STUDENT PARKING
Roper Avenue
P5 STAFF PARKING
P 12
SE14.1
P 5
Bookstore
Kyle Creek
SE 14 LIBRARY
MEDICAL SERVICES
TAPS
SE 10
SE 6.2
SE 16 STUDENT ACTIVITY CENTRE
GYM
SE 12
SW 10 NOOTKA
SW 12 CHILCOTIN
SW 13 CARRIER
Laurie Jack Lane
SW 11 SALISH
OFFICE
SW 3
SW8.1
SW8.2
SW8.3
SW8.4
SW8.5
SW8.6
SW 5 THEATRE
SW 9
I.E.T.E.
BIOTECHNOLOGY
PLASTICS
P6
SW 10 — SW 16 MAQUINNA RESIDENCES
STUDENT PARKING
CHILDCARE
SW 7
SW 3
P9
Fairey Street
PB/C8
White Avenue South
P4
P6
Willingdon Avenue
Sanderson Way








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ADMISSION: FULL-TIME

Burnaby is our main campus and primary location for processing applications and maintaining permanent student records. However, registration is possible at some satellite campus sites including the Downtown Education Centre, 549 Howe Street, Vancouver.

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

Admission Policy

Prompt and equitable attention will be given to all applications. In those programs where the number of applications exceeds available seats, BCIT will select those applicants deemed to have the best opportunity for success. Applicants will be considered for one program at a time.

BCIT's primary purpose is to provide high-quality, post-secondary technological and technical education and training to the residents of British Columbia and Canada. National Diplomas and Certificates are offered in more than 132 full-time programs.

Applicant priority is given first to B.C. residents who are Canadian citizens and landed immigrants and who have lived in B.C. for the immediate 12 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.

All applicants must provide official proof that they meet Institute and Program prerequisites. Applicants lacking specific prerequisite courses or required grades will be referred for upgrading. All application documents must be supplied in the English Language. Translations into English are at the applicant's expense. Application documents will not be returned to applicants and become the property of BCIT. Copies should be retained by the applicant for future use.

Final acceptance or non-acceptance by BCIT is the decision of the Registrar. BCIT reserves the right to accept only those applicants who appear to have the greatest capability to succeed in their chosen programs.

Fraudulent Documents

It is a serious offense to submit fraudulent documents when applying for admission /registration. This includes submission of information constituting misrepresentation. Applicants who submit fraudulent documents will be dealt with severely with the minimum penalty for such conduct being non-enrolment at BCIT for one year and the maximum penalty being an indefinite ban on enrolment.

Academic Requirements for Admission

Guidelines are established for admission to promote student success in programs. Most programs require grade 12 graduation with specific Grade 11 and Grade 12 subjects. Grade 10 is the minimum entrance requirement for some programs, how-ever, employers may require Grade 12 graduation as a condition of employment. BCIT will take appropriate combinations of education and experience into consideration.

Applicants who complete the General Education Development (G.E.D.) or the Basic Training for Skills Development level 4 successfully will be considered to have the equivalent of Grade 12 graduation with English 12 (Pass).

Provincial Adult Basic Education (ABE) Diploma

The Provincial Adult Basic Education (ABE) Diploma is considered to be equivalent to BCIT general prerequisites; that is, graduation from Senior Secondary School. Applicants should check with the Admissions department to ensure courses taken through the ABE program are acceptable for admission to BCIT.

Applicants Currently Attending B.C. High Schools

Many programs require specific grades in the required courses. Confirm the entry requirements for your program and note the following:

1. *Mathematics*

   Where Math 12 is a prerequisite, BCIT WILL NOT accept Survey Math 12.

   Where Math 11 is a prerequisite, BCIT WILL NOT accept Math 11A or Introduction to Math 11 or Trades Math 11.

   Where Math 11A is a prerequisite, BCIT WILL accept Math 11 or Introduction to Math 11, or Trades Math 11.

   Where Grade 10 is a prerequisite, BCIT WILL accept Math 10A or Math 10.

2. *English*

   Academic English 12 is required for all Technology programs. Check program requirements to see if a specific grade is required for entry to your program.

   Where English 12 is a prerequisite, BCIT WILL NOT accept Communications 12 or English 12 (M.E.).

   Where English 11 is a prerequisite, BCIT WILL accept Communications 12 with a "B" or better.

   Grade 12 graduation is a prerequisite to most Trades programs. If no specific reference is made to an English 12 requirement, BCIT will accept Communications 12 or English 12 (M.E.).

   Where Grade 10 graduation is a prerequisite, English 10 is required for entrance.

English Language Proficiency

Since all BCIT students must possess an acceptable level of English language skill, applicants whose first language is not English and who have not graduated from B.C. Senior Secondary School will be required to demonstrate their competence in one of the following ways:

1. By successfully completing the Test of English as a Foreign Language (TOEFL) and Test of Written English (TWE).

   Scores required to satisfy various prerequisites are:

   English 12:

TOEFL 600 +	TWE not required
TOEFL 550-599	TWE 4.5+

   English 11:

TOEFL 500	TWE not required

   To obtain the information bulletin which outlines worldwide test locations and application procedures, write to: Test of English as a Foreign Language, CN 6151, Princeton, New Jersey, U.S.A., 08541-6151; or

2. By successfully completing the Vancouver Community College English Language Assessment Test.

   Scores required to satisfy various prerequisites are:

English 12	:	145 minimum
English 11	:	135
Communications 12	:	135
English 10	:	125 minimum;

   or

3. By successful completion of an approved, equivalent English or Communications course at another institution, with the entry grade required for the program you have applied for. Please contact BCIT Student Services, Tel. 434-3304, to determine the approved equivalents; or

4. By successful completion of a BCIT Communications course.

   Scores required to satisfy various prerequisites are: English 12 with a C+ or better, you must achieve a mark of 75% or better in COMM 0009/0005. English 12 with a C or better, you must achieve a mark of 70% or better in COMM 0009/0005. English 12 with a P or better, you must achieve a mark of 65% or better in COMM 0009/0005. English 11, you must achieve a mark of 50% or better in COMM 0009/0005 or a mark of 75% or better in COMM 0004.

5. Some Trades programs allow applicants to write an Admission Assessment Test (Pretest) to determine their English

language and Math ability and eligibility for entrance. Please note: Not all programs offer this option. Check the program prerequisites section to see if a pre-test is offered; or

6. Individual assessment by the BCIT Communications department. This is only allowed when none of the other options are available to the applicant, on the recommendation of the Admissions department.

Mature Students

An applicant who has not graduated from a Senior Secondary School may be considered for admission as a "Mature Student." Mature students will be considered on the basis of their relevant experience. They must meet the Institute's English language requirements and any prerequisites specified by the Program. Applicants must supply academic documents and/or proof of relevant experience to support their applications. Note: not all programs participate in the selection of students under this category.

Transfer from Regional Colleges

BCIT offers transfer credit towards various programs from recognized regional colleges in B.C.

Direct Entry

Direct entry is the entry of students to any level of a program where advanced standing is given when standard course requirements are recognized as having been completed elsewhere or by other means. Direct entry may apply to any level in the program beyond level one, but could also apply to combinations of courses in multiple levels. Sometimes a student's program of study is customized based on the individual student background. NOTE: Direct Entry students will only be granted up to 50% transfer credit of the total program credit. Applicants who are interested in Direct Entry Admission should apply and submit all relevant documentation to Admissions. For more information call Admissions at 432-8419.

Graduates of Secondary School Career Preparation Programs

BCIT presently has agreements with a number of School Districts throughout the province which give special status to Career Preparation graduates. A limited number of seats are designated for Career Preparation graduates in certain trades programs. These spaces are assigned using a competitive process which is specified in the course descriptions for each participating program. It is important to note that meeting program prerequisites is still required for acceptance even under this special arrangement. For further information see your high school counsellor, Technical Education teacher, or call BCIT Student Services at 434-3304, or 1-800-667-0676 for enquiries from outside the Greater Vancouver area.

Admission: How to Apply

The Application for Admission form and all official supporting documentation should be submitted as early as possible to the Admissions Department, because spaces are limited in most programs. Application forms and information are available from BCIT Student Services, Tel. 434-3304. The application fee of $15 must be paid at the time of application. Applications received without the $15 fee will be held but not processed. Applicants are considered for only one program at a time. Technology applicants may indicate a 1st, 2nd and 3rd choice in order of preference.

Admission: When to Apply

Applications are accepted year round. However, applications that are received prior to the processing dates noted below are held until the date stipulated.

Admission: Technology Programs

Intake Period	Processing Begins
Medical Radiography:	
January 1994	January 1993
Electronics, Nursing:	
January 1994	June 1993
August/September 1994	January 1994
Medical Radiography:	
January 1995	January 1994
Electronics, Nursing:	
January 1995	June 1994

ETE Intake Period	Processing Begins
January 1994	September 1993
May 1994	January 1994
September 1994	May 1994
January 1995	September 1994
May 1995	January 1995

Admission: Trades Programs

Applications for admission to Trades programs are received and processed on an on-going basis.

Admission: Document Requirements

The following official documents MUST accompany the Application for Admission form. Photocopies, unless certified, are not acceptable.

1. Senior secondary school transcript showing courses taken, marks received and successful Secondary School graduation. For Trades Training programs, the transcript must show that the grade level required for entry (eg. Grade 10) has been completed.

   Applicants who are presently attending high school must submit a statement of marks for Grade 11 subjects and first semester Grade 12 subjects from the principal's office and a statement showing courses presently attended.

   All marks must be substantiated by a final, official, secondary school transcript incorporating the school and provincial exam results. The official transcript from your secondary school must be received in a sealed envelope. It must come to BCIT in its original, unopened, sealed state.

2. If applicable, all official post-secondary school transcripts.

3. Applicants who are not Canadian citizens must submit official government documents indicating Landed Immigrant status or Student Authorization designated for BCIT. International applicants must submit original official transcripts. BCIT Admissions understands the nature and importance of the original documents required by international applicants and every effort will be made to ensure that these documents are returned. Where transcripts and other official documentation are not in English, the original documents must be accompanied by English translations and notarized at the applicant's expense.

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

5. Applicants who have been selected for admission must have medical insurance prior to registration. Non-Canadian students must apply in person to BCIT Medical Services for an "Application for Student Medical and Hospital Plan" prior to attending BCIT. Payment for this insurance must be made at this time, by cheque or money order, to the insurance company.

6. Applicants who withdrew voluntarily or were withdrawn from another post-secondary institution may be asked by the program department to provide a written explanation for their withdrawal or for written authorization to request a report from the previous institution. This report may be used to determine acceptance to the BCIT program.

Academic documents are not returned. Applications and documents are not retained

by the Institute for those applicants who are accepted but are unable to enrol or for those who are not accepted. Applicants who wish to be considered for a future start date must reapply and resubmit supporting documents.

How to Make up Course Deficiencies

Preparatory programs are available for those students who lack specific prerequisites or desire refresher courses. For information, contact Student Services at 434-3304 or Academic Studies at 432-8515.

Engineering Technology Entry (ETE) Program

This 15-week program is designed to provide academic upgrading to students wishing to enrol in a BCIT Engineering Technology. The ETE program will provide courses in chemistry, communications, mathematics, physics and introduction to computers, which meet the Engineering Technology prerequisites. Subject to successful completion, students enrolled in the ETE program may be provisionally accepted into an Engineering Technology program. For further information refer to Academic Studies on page – 98

Trades Admission Assessment Test (Pretest)

Many Trades programs allow applicants to challenge admission requirements by completing entrance examination(s). Exams are written every Tuesday and Thursday morning throughout the year, from 9 am to 12 noon, in Room 334 Building NE1 (J.W. Inglis). Applicants are not required to pre-register but must arrive on time as no one is admitted once the exam is in progress. Applicants currently attending High School who live outside the Lower Mainland, may arrange to write the exam at their High School. Tel. 434-5734 local 5279 for more information.

Readmission

Students who interrupt their full-time studies can apply to re-enter their program at a future date. Readmission may depend on the successful implementation of a plan resolving previous academic difficulties, suitability of program selection, seat availability, time elapsed since enrolment, and other admission criteria. Note that when program curriculum changes students will be required to make up course deficiencies if new course material has been introduced. To request readmission to the Institute, an application form must be completed and submitted to Admissions. A detailed statement indicating goals and intent must be included.

Part-time Day Course-by-Course Registration

Students may register in courses offered in full-time programs subject to the approval of the Registrar and Program Head, space being available, with official proof that prerequisites have been met.

A student making application for part-time day classes must obtain the signature of the program head and instructor of each course using the form "Daytime Course-by-Course Registration" available at the Student Records Office. Completed forms must be returned to the Student Records Office; registration will be permitted upon acceptance. Tuition fees are due and payable at time of registration. First-time applicants to part-time day courses must fill out and submit a full-time application form, a $15 application fee and official documentation proving that they meet the Institute's general admission requirements of English 12 and citizenship. Applications must be submitted no later than 10 days into the term otherwise late payment reinstatement charges will apply.

APPLICANT STATUS CATEGORIES

Candidates making application will be informed of their status in writing according to the following guidelines:

Offer of Admission

Applicants who are selected to receive an Offer of Admission will have met the minimum requirements of the Institute and will have been deemed the most suitable candidates for the program. Selected applicants will receive either a **Full Offer** of Admission or a **Provisional Offer** of Admission.

A Full Offer will be granted to selected applicants who completely meet Institute and program admission criteria.

A Provisional Offer will be granted to selected applicants who have demonstrated to a satisfactory degree that criteria are in the process of being fulfilled. A Provisional Offer includes the condition that all outstanding criteria must have been successfully fulfilled **30 days prior to the start of classes**. It is the responsibility of the applicant to ensure that all admission criteria are met as prescribed by this deadline. Applicants maintaining a Provisional Offer of Admission will be excluded from their program classes until official proof that all criteria have been successfully completed is submitted to the Admissions Department.

Applicants must accept their Full or Provisional Offer of Admission by paying a commitment fee to confirm their intention to attend. Failure to accept an Offer of Admission will result in cancellation of the offer. The Institute has the right to cancel an Offer of Admission at any stage if any or all conditions of admission and payment as specified by deadlines are not fulfilled.

Wait List

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 offered the seat. Wait lists are not transferred to subsequent intakes for Technology Programs and some Trade Programs. Applicants to Trades programs are normally wait-listed as of the date their application is complete. If there are more applicants than seats available, programs may have a competitive selection process.

Non-acceptance

The applicant is not selected to receive a Full or Provisional offer of Admission and/or the program is full and closed, (seats and wait list full).

CURRICULUM REVIEW

There are several programs currently undergoing curriculum review. Adjustments may occur to course offerings and/or program delivery within these programs. Please refer to the individual program description sections in the full-time calendar to determine which programs are affected.

PROGRAM PREREQUISITES

School of Business

Administrative Studies Degree Completion Program

BCIT Diploma of Technology in one of: Human Resource Systems, Management Systems, Financial Management, Marketing Management, Operations Management, International Trade, Transportation Logistics, and business experience.

Note: The Bachelor of Administrative Studies degree is offered by the Open Learning Agency in collaboration with BCIT.

Broadcast Communications

High School graduation with English 12 plus short essay (500 words) on career aspirations and reasons for entering Broadcasting. Proof of 25 wpm typing speed.

Business Administration (Post-Diploma)

Diploma of Technology in Health or Engineering; or College/University graduation or equivalent. Previous business experience preferred.

Financial Management

High School graduation with Math 11 and English 12, both with C+. Preference given to applicants with an average better than C+ in Grade 12 courses and to those with at least 2 years full-time working experience.

Human Resource Management (Post-Diploma)

Diploma of Technology, College/University graduation, plus FMGT 1152 (FMGT 109) with 65% or better and proficiency in microcomputer spreadsheet programs.

Human Resource Systems

High School graduation with Math 11 and English 12, both with C+.

International Trade
High School graduation with Math 11 and English 12, both with C+. Basic typing skills recommended.

Management of Advanced Technology (Part-time Studies Only)
BCIT Diploma of Technology in one of: Human Resource Systems, Management Systems, Financial Management, Marketing Management, Operations Management, International Trade, Transportation Logistics, and business experience.

Management Systems
High School graduation with Math 11 and English 12, both with C+.

Marketing Management
High School graduation with Math 11 and English 12, both with C+. Grade 11 and 12 Science courses beneficial. Also a letter of intent (500 words) and a resume are required from all applicants. In addition the Marketing Communications option requires two letters of reference. Note: program option must be stated on application form.

Operations Management
High School graduation with Math 11 and English 12, both with C+. Physics 11 desirable.

Operations Management Certificate for Tradespersons
Journeyed certification. 3-5 years experience in trade. Math 11 and English 12, both with C+, or equivalent.

Transportation Logistics
High School graduation with Math 11 and English 12, both with C+. Basic typing skills recommended.

Note: Please refer to page 9, if you wish to be considered under the Mature Student category.

See program description pages for other program prerequisites.

School of Electrical and Electronic Technology

Automated Business Equipment Technician (Diploma of Trades Training)
Successful completion of Electronics Technician Common Core Program.

Electrical Control Service Technician
Graduation from a provincially approved Electronics Common Core Program.

Electricity and Industrial Electronics
High School Graduation with Math 11 with C or pre-test.

Electronics Technician Common Core
High School Graduation with Math 11 with C or better; Math 12 preferred.

Industrial Instrumentation Service Technician
Graduation from a provincially approved Electronics Common Core program.

Security Alarm Installer
High School Graduation with Math 11 with C (preferred minimum) or pre-test. Security clearance from the office of the B.C. Attorney General.

Telecommunications Technician (Diploma of Trades Training)
Electronics Technician Common Core program or equivalent plus Math 11 with C. Math 12 preferred.

Electronics Engineering Technology
High School graduation with Math 12 and Physics 11, both with C+, and English 12 with C. Preference will be given to applicants with Physics 12, or Engineering Technology Entry Program (6 months).

School of Engineering Technology

Biological Sciences
See Biotechnology and Food Technology.

Biotechnology
High School graduation with English 12, Math 12 and Chemistry 11.

Building
High School graduation with English 12, Math 12 and Physics 11, all with C. Preference will be given to applicants who achieve a B or better in prerequisites. Post-secondary experience; construction industry experience preferred.

CAD/CAM
See Mechanical Technologies.

Chemical Sciences
High School graduation with English 12, Math 12 and Chemistry 11. Physics 11 and Chemistry 12 strongly recommended.

Civil and Structural
High School graduation with English 12, Math 12 and Physics 11. Preference given to applicants who have a "C" or better in prerequisites.

Computer Systems
Applications are invited from interested persons regardless of formal prerequisites. The following prerequisites usually ensure acceptance if space is available. All applicants are required to attend a Computer Systems Information session and then submit a portfolio which includes a resume, a covering letter describing their background and program and career expectations. Proof of completion of English 12, Mathematics 12, and Computer Science 12 all with a C+ or better or equivalent are minimum prerequisites. For Computer Systems Information session dates, contact Student Services at 434-3304.

Engineering Technology Entry Program (ETE)
English 11 and Math 11 or equivalent.

Fish, Wildlife and Recreation
High School graduation with Math 11 with C+, Biology 11, English 12 and one of the following: Science 11 or Science 12 or Math 12. Related work or volunteer experience an asset.

Food Technology
High School graduation with Math 12, English 12 and Chemistry 11.

Forestry
High School graduation with Math 11 with C+ and English 12, plus either two Science 11's, or one Science 12 or Math 12.

Geographical Information Systems (Advanced Diploma)
Diploma of Technology/University/College degree in a related field or approval by the Associate Dean. Good communication skills and fundamental computer literacy and programming skills are important.

Industrial Education Teacher Education
General Program: High School Graduation plus one year University level courses (30 credits). Accelerated Program: Trades or Technology Qualification plus work experience.

Mechanical Technologies: Mechanical Systems, CAD/CAM, Design, Manufacturing
High School graduation with English 12, Math 12 and Physics 11 are prerequisites for first-year entry. A common first year is shared by the following second year specialties: CAD/CAM, Mechanical Design, Mechanical Manufacturing, Mechanical Systems. On successful completion of the first year, students select their appropriate specialty to complete the diploma requirements.

Mining
High School graduation with English 12, Math 12 and either Physics 11 or Chemistry 11.

Nondestructive Testing (Certificate)
High School graduation with Math 11 and English 12 plus trades training or experience. Suitable trades include Welding, Pipefitting, Ironworking, Boilermaking, Aeronautical Trades, Millwright, Machinist, previous NDT.

Petroleum and Natural Gas
High School graduation with English 12, Math 12 and either Chemistry 11 or Physics 11.

Plastics
High School graduation with English 12, Math 12 and either Chemistry 11 or Physics 11.

Renewable Resources
See Fish, Wildlife and Recreation and Forestry.

Robotics and Automation
High School graduation with Math 12 and Physics 11, both with C+, and English 12. All prerequisites must have been completed within the last three years.

Surveying and Mapping
High School graduation with English 12, Math 12 and Physics 11. Preference will be given to applicants with a "C" or better in prerequisites.

Surveying Technician (One Year Certificate)
High School graduation with English 12, Math 12 and Physics 11.

Wood Products Manufacturing
High School graduation with English 12, Math 12 and one Science 11: Physics (preferred) or Chemistry or Biology.

Note: Please refer to page 9 if you wish to be considered under the Mature Student category.
See program description pages for other program prerequisites.

School of Health Sciences

Bachelor of Health Science
a) Diploma in Nursing or a Health Technology; and
b) BCIT Advanced Diploma; and
c) 30 credits from the Open University.
Note: The Bachelor of Health Science is offered by the Open Learning Agency in collaboration with BCIT.

Biomedical Engineering
High School graduation with Math 12, Physics 11, Chemistry 11, all with C+, and English 12 (Math, Physics, Chemistry and English must have been completed within the last 5 years). Interview.

Cardiology (One Year Certificate)
High School graduation with Math 12, Physics 11, Chemistry 11, Biology 12, English 12, all with C+. Interview. Prerequisites should have been completed within the last 5 years. If more than 5 years have elapsed, applicants will be assessed individually. CPR "C" certification is required. Work-related or volunteer hospital experience highly recommended.

Cardiovascular Technology (Second Year Diploma)
Academic and clinical performance in the Cardiology program.

Cytogenetics Laboratory Technology (Post-Diploma)
B.Sc. in Cell Biology with emphasis on genetics and medical/molecular genetics, or current CSLT certification (R.T) in Medical Laboratory Technology with academic prerequisites for 4th year university courses in genetics and medical/molecular genetics.

Diagnostic Medical Sonography (Post-Diploma)
Diploma of Technology in Radiography, Nuclear Medicine or Registered Nursing, or B. Sc. in appropriate health related field. Interview.

Electroneurophysiology
High School graduation with Math 12, Physics 11, Chemistry 11, all with C+ and English 12. Interview.

Environmental Health
High School graduation with English 12, Math 12, Physics 11, Biology 11, Chemistry 12. Preference given to applicants who have completed prerequisites within last 5 years and have achieved a "C+" standing. Preference may be given to applicants with Biology 12.

Medical Laboratory Technology
a. For the present 2-year program
1st year University courses or Community College equivalents:

Biology	UBC 101 or 102
Chemistry	UBC 110 or 120
Physics	UBC 110 or 120
English	UBC 100 (6 credits)
Mathematics	UBC 100 (6 credits)

All completed within the last 5 years. Interview.

b. For the proposed 3-year program
High School graduation with English 12, Biology 12, Chemistry 12, Math 12, Physics 11, all with C+ minimum and completed within the last 5 years. Interview.

Medical Radiography
High School graduation with Math 12, English 12, Physics 11 and 12, Biology 11 and 12, all with C+, and completed within the last 5 years. Basic Life Support (Level C). Basic typing skills. Basic computer course. Volunteer work minimum 40 hours (candy striping, etc.). Interview.

Nuclear Medicine
High School graduation with English 12, Math 12, Chemistry 12, Physics 11 all with C+ minimum. Biology 11 is strongly recommended. These prerequisite courses should have been completed within last 5 years. Interview.

Nursing
a. High School Graduates
Chemistry 11, Biology 12 (preferred) or Chemistry 12, English 12, all with C+; Math 11 with C; valid standard first aid certificate; minimum 30 hour patient contact; hospital experience preferred. Interview.

b. G.E.D. or B.T.S.D. Level 4 Graduates
Chemistry 11, Biology 12 (preferred) or Chemistry 12, English 12, all with C+, Math 11 with C. 30 hours patient contact in a medical facility. References. Interview.

Occupational Health and Safety
High School graduation with English 12, Math 12, Chemistry 11, Physics 11. Interview. Prerequisite completion within last 5 years preferred.

Prosthetics and Orthotics
High School graduation with English 12, Math 12, Physics 11. Woodworking /Mechanical courses in metalwork and woodwork recommended.

Note: Program intake is every other year. The next intake will be September 1994.

Please refer to page 9 if you wish to be considered under the Mature Student category.
See program description pages for other program prerequisites.

School of Trades Training

Aircraft Maintenance Engineer: Category M
High School graduation with Math 11 and Physics 11. Good color vision essential. Mechanical background recommended.

Aircraft Structures
High School graduation with Math 11A or Aviation Trade Math 11 or pre-test. Good color vision essential. Drafting recommended.

Auto Collision Repair/Refinishing
High School graduation or pre-test in Math and Reading skills. Valid B.C. Driver's Licence. Good physical condition. Not allergic to paints, thinners, etc. Free from respiratory problems.

Automotive Electronics Technician
Journeyed or T.Q. status (must provide licence number); or apprentice with minimum 2 years in trade; or successful completion of Automotive Mechanic; or Mechanical Assessment test and pre-test.

Automotive Mechanic
High School graduation with C or better in English 12 and Math 11 or pre-test. A valid driver's license that is acceptable for use in B.C. is required.

Automotive Service Technician
High School graduation with English 12 with C and Math 11 with C+ or pre-test. Interview granted after academic requirements have been met.

Avionics: Category E
Electronics Technician Core Program or equivalent, plus High School graduation with Math 11 with C or better, Math 12 preferred. Good color vision essential.

Boilermaking
Grade 10 or pre-test. Interview.

Carpentry
Grade 10 or pre-test.

Commercial Transport Mechanic (Bus and Truck)
High School graduation or pre-test.

Computer Numerical Control (CNC) Machinist: Basic
Machinist entry level trades training, trade certificate or journeyed status.

CNC Programmer
CNC Machinist certificate or journeyed status or CNC experience or interview.

CNC Programmer: Advanced
CNC Programmer graduates or interview.

Diesel Engine Mechanic
High School graduation or pre-test.

Drafting: Civil and Municipal
High School graduation with Math 11A or pre-test. Good hand/eye coordination. Technical aptitude.

Drafting: Mechanical
As above.

Drafting: Structural
As above.

Drafting: Architectural Design—Technical and Graphical Communication
High School graduation with Math 11. Preference will be given to those who have C+ in Math 12 and English 12. Applicants will attend a personal interview where they must submit the following:

1. A portfolio demonstrating their creativity in the manipulation of 3-dimensional form;
2. A short essay (500 words) detailing their reasons for choosing this program;
3. An aptitude test.

Gas Turbine Technician
High School graduation with Math 11. Physics 11 recommended. Communications 12 accepted in place of English 12. Interview may be required.

Heavy Duty Mechanic
High School graduation or pre-test.

Inboard/Outboard Mechanic
High School graduation or pre-test.

Industrial Maintenance Mechanic
High School graduation with mechanical electives or pre-test or assessment by department.

Ironworking
Grade 10 or pre-test.

Joinery
Grade 10 or pre-test.

Machinist
High School graduation or pre-test.

Millwright
High School graduation or pre-test.

Motorcycle Mechanic
High School graduation or pre-test.

Painting and Decorating
Grade 10 or pre-test.

Plumbing
Grade 10 or pre-test.

Power Engineering: General Program
High School graduation or pre-test.

Power Engineering: Technical Program
High School graduation with Math 12 and Physics 11 or pre-test.

Power and Process Engineering (Diploma of Trades Training)
Valid 4th Class Power Engineering Certificate and one of the following: successful completion of the Power Engineering Technical program OR successful completion of the first year engineering-related, university or technical institute program OR individual assessment by the department (for applicants who do not possess the above requirements).

Sheet Metal Working
Grade 10 or pre-test.

Steamfitting
Grade 10 or pre-test.

Steel Fabricating
Grade 10 or pre-test.

Tool and Die Technician
High School graduation with mechanical electives and a successful interview by the department OR pass an entrance test measuring math and reading skills and a successful interview by the department.

Welding: Level C
Grade 10 recommended but an appropriate combination of work experience and education will be considered.

Welding: Level B
Registered "C" welder status. Completion of Level B modules plus appropriate work experience will qualify you to become a registered B welder in British Columbia.

Welding: Level A
Registered "B" welder status.

See program description pages for other prerequisites.

APPRENTICESHIP TRAINING

"Apprenticeship is a time-proven method of developing a skilled workforce and is seen by many as vital to maintaining and improving Canada's economic position by increasing the productivity, competitiveness and mobility of the workforce.

Graduates from apprenticeship programs in British Columbia have an unrivalled reputation in Canada and North America, which is a credit to the organized and professionally administered process we call the Apprenticeship System."

Provincial Apprenticeship Board

Apprenticeship is a combination of on-the-job and technical training that leads to certification as a qualified journeyperson. The apprenticeship program is administered by the Job Training Division of the Ministry of Advanced Education and Job Training.

Apprenticeship is recognized, not only as a premier training model that provides quality of training, but also for its on-going responsiveness to the training needs of industry. Employers and employees gain two benefits from apprenticeship training:

1. They become part of a training system designed to meet industry's present and future needs and insuring, to the best possible extent, against future uncertainties in the supply of skilled trades persons.

2. Apprenticeship is earning while you learn and many of our existing businesses in multitudes of operations are managed by former apprentices.

Earning While Learning

Apprenticeship involves learning a trade through observation, practice, study and attending short technical courses at a college or technical institute. As an apprentice you work under the supervision of a qualified tradesperson to become familiar with the principles, skills, tools and materials of the trade.

Depending upon the trade, the term of apprenticeship varies in length from 2 to 5 periods (approximately 2 to 5 years). During this time you are indentured (bound by contract) to an employer who has agreed to provide the opportunity for you to work and gain experience in the trade. Your obligation

as an apprentice is to perform the job to the best of your ability. For most trades, you must supply your own tools.

As an apprentice you are an employee. You are usually paid an hourly wage, which increases according to your experience in the trade and the current journeyed rate of pay. Depending upon the trade and the period of apprenticeship, wages range from 50% to 90% of current journeyed wages.

Apprenticeship At BCIT

BCIT, with input from industry, has developed training at all levels to meet industry's present and future demands.

Pre-employment Training

Pre-employment training is available in over 20 apprenticeable occupations; graduates have a high placement in industry. The training of between 20—40 weeks is designed to accomplish two things:

1. provide basic skills and fundamental theory to selected students

2. provide employers with young people who have demonstrated their ability to become successful apprentices, who are capable of becoming proficient in their chosen occupation, who can meet the challenges of future technological changes.

Regular Apprenticeship

The Province of British Columbia contracts between 50%—60% of all regular apprenticeship technical training to BCIT. Regular classes are scheduled in over 30 apprenticeable occupations with annual training periods of between 4 and 10 weeks in length.

Technical Training

Apprentices are required to attend technical training courses of 4 to 10 weeks in length in each period of apprenticeship. No tuition fees are charged for these courses but you must purchase course supplies and pay Student Activity Fees. Income support for apprentices attending technical training courses is provided by the Canada Employment and Immigration Commission.

The Red Seal Program

In certain trades it is possible for graduate apprentices to qualify for the Interprovincial Red Seal which means their trade qualifications are recognized throughout Canada. The Interprovincial Red Seal is awarded when a person has successfully completed apprenticeship and has obtained a passing mark of 70% on an approved interprovincial examination.

Apprenticeship Programs

Apprentice training is provided by BCIT for students who are employed as apprentices. For information on sponsorship in Apprenticeship training, contact the Ministry of Advanced Education and Job Training at 4946 Canada Way, Burnaby, B.C. V5G 4J6. Tel. (604) 660-7100.

BCIT offers Apprenticeship training in the following programs:

Automotive Mechanic
Boilermaking
Carpentry
Commercial Transport Mechanic
Drywall-Wall and Ceiling Installer
Drywall-Finisher
Electrical Motor Winder
Electrical Work
Electronics
Gas Fitter
Glazier
Heavy Duty Mechanic
Inboard/Outboard Mechanic
Industrial Instrumentation
Insulation (Heat and Frost)
Ironworking
Joinery (Cabinetmaker)
L.M.I. Benchman
L.M.I. Circular Saw Filer
L.M.I. Saw Fitter
Machinist
Millwright
Motorcycle Repair
Plumbing
Sheet Metal
Steamfitting and Pipe fitting
Steel Fabrication
Welding

COOPERATIVE EDUCATION (COOP)

Cooperative education formally integrates a student's academic studies with work experience provided by cooperating employer organizations.

Coop programs allow students to explore a career in a structured and purposeful manner, to test their skills, to adjust to the working environment, to acquire relevant work experience as well as first-class training and, in addition, Coop work terms help students to finance their education.

Placement Responsibility

It is the goal of the BCIT Cooperative Education Program to make the work placement period as structured, relevant, safe and meaningful as possible. To this end, BCIT employs full-time Coop coordinators to find meaningful work experience, monitor the student's progress and check health and safety on the job, etc. However, these considerations are not absolute, and the Coop student must take some responsibility for these factors. While Coop coordinators find the majority of job placements for students, it must be recognized that during certain periods of the business cycle, job placements may be hard to find. It is then the responsibility of the student to work with the coordinator (and indeed on his/her own) to find meaningful work experience.

School of Electrical and Electronic Technology and School of Engineering Technology

Some technology programs offer Cooperative Education opportunities. Students wanting to participate in the Coop program must meet separate requirements in addition to the technology program entrance requirements. Each program has its own Coop Education Admission requirements, which are available from the Engineering Technology Coop Office at 432–8753.

School of Trades Training

Cooperative Education is not an option but an integral part of some trades programs, subject to the successful performance criteria of the program itself. Acceptance into the trades program includes entrance into the Coop program, where the Coop program is offered. Successful completion of the minimum Coop placement hours is required for graduation. More information may be obtained from the Trades Training Co-op office at 432–8634.

Cooperative Programs

Trades Training

- Automotive Collision Repair/Refinishing
- Automotive Service Technician
- Industrial Maintenance Mechanic
- Tool and Die Technician

Engineering Technologies

- Electronics Engineering Technology
- Robotics and Automation
- Renewable Resources

Cooperative Coordinators

Trades Training Programs

Gino Simeoni	432-8291
General Enquiries	432-8634

Technology Programs

Electronics Engineering Technology
Robotics and Automation

Ted Upward	432-8499
General Enquiries	432-8753

Renewable Resources

Ernst Wilmink	432-8458
General Enquiries	432-8458

Cooperative Education Policy

The complete Cooperative Education Policy including student, Institute and employer responsibilities is available through the Cooperative Education Office and the Registrar's Office. For more information on Cooperative Education programs please contact 432-8634 for Trades Training or 432-8753 for Engineering Technology programs.

COURSE IDENTIFICATION

Effective January 1994 BCIT will convert from a 3 digit to a 4 digit course number. The course identifier is a unique classification given to all BCIT courses. The course identifier will consist of a subject code, number and title.

a) Subject Code

A1. Is a four-character alphabetic mnemonic code.

A2. Represents the teaching department responsible for course content.

A3. The subject code is an easily recognizable code describing the main focus of the course.

b) Course Number

The course identifier will consist of a 4-digit number, with the first digit used to indicate the level of difficulty. The next three digits will be assigned sequentially, ranging from 100 to 999.

Level of Difficulty (rigor) is defined as:

1. a course that has prerequisite course(s). For example, Accounting 1 is required before you can take Accounting 2. Therefore the Course IDs may be FMGT 1120 and FMGT 2120 respectively.
   or
2. foundation work is required to take a particular course. That is to say, you need to complete a group of courses prior. For example, in order to take a particular course in Level 3, the student may be required to complete Level 1 and 2 courses. Therefore the course ID will have a 3XXX series designation.

Non-credit	Entry Level Certificate/ Diploma	Advanced Studies Advanced Diploma/Degree
0XXX	1XXX	5XXX
	2XXX	6XXX
	3XXX	7XXX
	4XXX	8XXX

c) Titles

C1. The course title is a concise description of the material covered.

C2. Courses that are a series will show the series number in the title.

COURSE CREDIT

A credit is defined as approximately one classroom hour per week over a 15-week term. Therefore, a course taught for 3 hours per week for 15 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).

Transfer from Full-time Studies to Part-time Studies

A student transferring to part-time from a full-time diploma program may be granted credit exemption for courses completed successfully. A student who discontinues in the full-time program is encouraged to consider part-time studies programs. Contact Student Services, Program Advising to arrange an appointment with an advisor for part-time studies.

Advanced Placement Categories

A maximum of 50% of the total credits in a program can be transferred into any one program.

1. **Course Exemption (EC)**
   Where the individual course completed at BCIT is equivalent in course content and assessment to the same or another BCIT course that is required within the program from which certification is sought.

2. **Course Credit (C)**
   Where the individual course(s) and/or experience is equivalent in content and assessment to a BCIT course that is required within the program from which certification is sought, for:

   a. course(s) completed at another recognized post-secondary institution;

   b. approved course(s) that have been completed within or sponsored by a company, government body, or organization;

   c. documented experiential learning validating mastery in a course based on approved academic evaluation criteria.

3. **Unassigned Credit**
   Where a course-to-course equivalency cannot be established, but the subject matter is credit-worthy toward the program for which certification is sought. This credit may be used as an elective credit (where applicable). Unassigned credit may be either in a subject area, eg. Economics—3 credits, or in a program area, eg. Civil & Structural—3 credits. Unassigned credit totals may not exceed the elective totals in a program of studies.

4. **Challenge Credit**
   Where approval has been granted to challenge a course by the Associate Dean, a formal evaluation procedure takes place. Students' abilities will be assessed through written and/or oral examination, research paper, or other means. As recommended by the Technology, Challenge Credit will only be recorded after the student has completed a specified number of BCIT credits; only a specified number of Challenge Credits will be allowed for each program. The challenge privilege is not extended to all courses and is disallowed for previously failed courses.

   Challenge Credit is not considered as work completed at BCIT, but when a course is successfully challenged the number of credits required to complete a program is reduced.

5. **Block Credit**
   Consideration for granting block credit is determined by individual programs. However, block credit is generally limited to first-year equivalency in an approved 2-year Diploma program or 50% towards any program. Block credit is not transferable from program to program. Block credit is only recorded after the student has enrolled in the program in which block credit is recognized.

   Block credit may be granted for:

   a. Diploma of Technology graduates from a recognized post-secondary institution who are pursuing a second diploma in an approved program;

   b. Baccalaureate graduates from a recognized post-secondary institution who are pursuing their first diploma in an approved program;

   c. Students from a recognized post-secondary institution who are transferring to BCIT to complete an approved program.

Guidelines

Applications for credit may be made for each term or for each academic year. Applications for the next term will be processed approximately halfway through the current term. Student course credit application forms can be obtained from Student Records.

a. Two-year diploma and one-year diploma students may apply for credit only after they have been fully accepted and have paid their commitment/term fees;

b. Students transferring into second year at BCIT may apply for credit upon receiving full acceptance; second-year courses must be applied for individually;

c. Students who are presently enrolled at BCIT may apply for credit at any time within the academic year.

Credit is granted or denied by the Registrar upon recommendation of the Program Associate Dean.

Specified Course Load Requirements

Students with credit(s) who need to enroll in substitute courses in order to meet load requirements for the following purposes, must have their substitute course(s) approved by the Associate Dean prior to the term start date.

1. B.C. & Canada Student Loans: 60% each term.

2. Graduating Awards: 100 % in each of the last two academic terms in the program.

3. Scholarships: 100% in each of the two academic terms being considered in the program.

4. Honors Standing: 75% of the total courses (in part-time or full-time) taken from an approved second-year program of studies.

Applications for credit must be submitted to the Office of the Registrar no later than 14 calendar days after the commencement of classes for each level. Late applications will only be accepted if prior written authorization has been received by the Registrar from the Program Associate Dean.

Change of Program

After the commencement of classes, a request for program transfer requires the completion of a Program Change form by the student. Forms are available in Student Records. It is the responsibility of the student to obtain approval and signatures from the appropriate Associate Dean, Dean and Registrar. Permission must be granted by the Registrar before a change in program can be effected. Program change is subject to space availability and prerequisites being met. Wait-listed applicants are given priority placement before students who request to transfer once enrolled.

EXAMINATIONS, GRADING AND MARKS

Formal examinations are written at the end of each term or at the conclusion of a course. 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 will not be returned.

Grading for Trades programs will depend on the method of training, learning outcomes and, in some cases, standards established jointly with industry and Apprenticeship training.

Determination of Standing

Final standing is determined based on term progress and examination results.

80—100%	First Class Standing
65—79%	Second Class Standing
50—64%	Pass Standing
0 —49%	Failure

Failure: %

%F less than 50% except some course(s)/ program(s) may have a fail grade greater than 50% as outlined in course descriptions.

F formal withdrawal after official term deadline. Grade not calculated in weighted or cumulative term averages.

OF unofficial/unapproved withdrawal, (course abandonment).

Withdrawal:

W approved official withdrawal from a course/program within withdrawal deadline. Grade not calculated in weighted or cumulative term averages.

Satisfactory:

S course requirements fulfilled, no % mark assigned. Grade not calculated in weighted or cumulative term averages.

Unsatisfactory:

U course requirements not fulfilled, no % mark assigned. Grade not calculated in weighted or cumulative term averages.

Course Credit:

C recognition of approved equivalent studies outside BCIT. Grade not calculated in weighted or cumulative term averages.

successful Challenge Exam.

Course Exemption:

EC recognition of previous course exemption completion at BCIT (used only when course numbers differ and/or program goal changes). Grade not calculated in weighted or cumulative term averages.

Aegrotat:

%A pass standing granted to a student who has a good term record but has an incomplete evaluation due to illness or other extenuating circumstances.

Adjudicated Pass:

AP course standing raised to pass level based upon overall performance, permitting the student to continue in the program or to graduate.

Provisional Pass:

%PPstanding granted on the basis that the student will reach a pass standing in a continuing relevant subject area; will be changed to (P)ass or (%F)ail depending on success in the relevant continuing subject area.

Provisional Pass Fulfilled:

P provisional pass conditions achieved.

Not complete:

N course requirements not complete.

Audit:

AU attended course, no credit given. Student is not formally evaluated and does not write examinations.

Attended Non-examined Course:

X no examination or grade given. Grade not calculated in weighted or cumulative term averages.

Outside Source Grade:

R refer to outside source for student achievement, eg: Apprenticeship Board—apprenticeship programs. Grade not calculated in weighted or cumulative term averages as not being taken as part of a full-time program.

Students should note that all course attempts remain permanently on a student's record.

Withdrawal from Program/ Courses

1. Students wishing to withdraw from one or more courses must arrange to do so through their Program Head or Associate Dean who will inform the Registrar's Office. Students wishing to effect a full program withdrawal must complete a withdrawal form available at Student Services.

2. Students withdrawing officially 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. It is the student's responsibility to check withdrawal deadlines. Appeals to the Registrar will be adjudicated by the Registrar and the Dean.

Distribution of Marks

The Statement of Marks will be distributed to students at the end of each term by the Registrar's Office. In addition, graduating students will receive one free official transcript indicating certification granted. Students who fail the term and are not permitted to continue in the program will be advised immediately of their situation. A letter indicating student status and Statement of Marks will follow. **Marks will not be released over the telephone.**

Transcripts

A fee of $5 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. All requests must be submitted in writing to Student Records.

Withholding Statement of Marks

No Statement of Marks, transcript, diploma or certificate will be issued until the student has resolved 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

The following policy is under review and is subject to change. Contact the Registrar's Office for further information.

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 awarded is cautioned that the grade has been reviewed carefully and, aside from clerical error, reassessment seldom results in a higher mark.

Students wishing reassessment of their academic standing must first discuss the matter with the instructor responsible for the initial assessment and, if dissatisfied with the result of the discussion, with their Program Head and Associate Dean.

Failing a resolution at that level, students may 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.

A fee of $25 is required for each subject reassessed. If the mark or standing is favourably adjusted, the fee will be refunded.

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

A formal request for reassessment will not be accepted for term projects, essays, lab work, quizzes or mid-term exams. It is the student's responsibility to discuss any dispute about individual course work with the instructor immediately upon receiving the assigned grade.

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 $50 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 Educational 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 2.

Course Failure and Program Continuation

Students must achieve a pass standing in all courses in each term to successfully complete the term. Students who fail or withdraw from one or more courses in a term may be prohibited from continuing in the program, and may be required to apply for readmission (see Readmission procedure). When students are permitted to continue with their program, it is their responsibility to present evidence of successful completion of the failed course(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. Marks Review Guidelines apply within each School.

Course Substitution

Where special circumstances exist which prevent a student from completing a required course, notice recommending substitution must be given in writing to the Registrar's Office by the Program Head. Approval must be obtained from the Registrar's Office prior to course start date. Verbal agreements for course substitution cannot be honoured.

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.

CREDENTIALS

Credentials are awarded to graduates of the British Columbia Institute of Technology. The various levels of certification are described in the diagram shown below and include a wide range of programs offered within each category.

Most programs prescribe a balance of applied theory and skills necessary for employment in technical, technological or

LEVELS OF CERTIFICATION	BUSINESS TECHNOLOGIES	ENGINEERING TECHNOLOGIES	HEALTH SCIENCES TECHNOLOGIES	TRADES PROGRAMS
Advanced Diploma	Advanced Diploma in Business	Advanced Diploma in Engineering Technology	Advanced Diploma in Health Science	
Advanced Certification	Advanced Certificate		Advanced Specialty Certificate	
Diploma	Diploma of Technology	Industrial Education Dip. Diploma of Technology	Diploma of Technology	Diploma of Trades Training (min. 1900 hrs)
Certification Level 3	Senior Management Certificate	Industrial Education Cert. Certificate of Technology	Certificate of Technology	Advanced Certificate of Trades Training (min. 400 hrs)
Certification Level 2	Management Certificate	Intermediate Certificate of Technology	Certificate & Health Care Mgmt Level 2	Certificate of Trades Training (min. 600 hrs.)
Certification Level 1	Associate Certificate	Associate Certificate	Health Care Mgmt Certification Level 1 & Associate Certificate	
Statement of Completion & Attendance				

para-professional occupations including some curriculum which draws from advanced professional courses.

Advanced credentials are designed to provide practising technicians or technologists with advanced knowledge, skills and attitudes necessary for professional competence, advanced technical, technological, clinical or management roles, or for individual growth.

In some program areas, Advanced Diplomas provide a direct path for degree completion at other post-secondary institutions. BCIT and the Open Learning Agency through its Open University have entered into collaborative degree arrangements in Business, Health Sciences and Engineering Technology.

Students may seek approval to use previously gained credit(s) toward a new program of study. However approval for credit can only be granted for up to 50% of the new program. Students wishing to seek approval to apply more than 50% of previously gained credit toward their new program, must present their request to the Associate Dean of their new program and to the Registrar.

Convocation exercises are held twice each year in January and June. Technology and some Trades Program graduates will have their credentials conferred at the ceremonies. Graduates unable to attend the convocation exercises will receive their credentials by registered mail.

Honors Diploma/ Advanced 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. This criterion also applies to one-year Diploma and Advanced Diploma programs.

Students who receive credit/exemption in one or more course(s) must register in acceptable substitute course(s) in order to maintain a 75% course load within the program term structure. Courses for this purpose must be pre-approved in advance of term start by the Associate Dean.

Issuing of Advanced Diplomas, Diplomas and Certificates

Upon successful completion of the requirements for certification, a graduating student must apply to the Registrar to be granted an Advanced Diploma, Diploma or Certificate of Technology. Trades Training graduates do not have to apply for certification. The Registrar is responsible for ensuring that all requirements for the program have been fulfilled before issuing such documents.

All credentials, with the exception of Statements, shall be signed by the Registrar, the Dean of the School and the President and shall be imprinted with the seal of the Institute.

Only one certification document will be issued to each graduate. Replacements for lost diplomas may be issued, at cost, at the discretion of the Registrar.

Application for Certification and Graduation

Students must apply to receive their Advanced Diploma, Diploma or Certificate of Technology by completing the Application to Graduate form available in Student Records, SW1, 1585. This applies to all students who are currently enrolled in their final course(s). Applications MUST BE received by Student Records by the 10th week of the final term or course(s), e.g.: Application for the June Graduation must be made not later than March which is 10 weeks into the final term. For further information, please contact the Graduation Eligibility Officer in Student Records at 432-8733.

FEES AND EXPENSES: FULL-TIME TECHNOLOGY PROGRAMS

Tuition Fee Policy for Academic Year 1994/95 (subject to change)

Tuition fees are reviewed annually and have been established by the Board of Governors of BCIT and approved by the Ministry of Education for the academic year 1993/94 and are subject to change each academic year.

1. A non-refundable commitment fee of $75 is due upon the applicant's offer of admission into first level, including one-year, post-diploma programs. This fee is applied towards the tuition fee and is not transferable to part-time courses, or acceptance into another Term.

2. An accepted applicant whose commitment fee has not been paid immediately upon acceptance or provisional acceptance, will forfeit the seat which has been reserved.

3. An accepted or provisionally accepted applicant is required to pay the remainder of first-level and fifth-level fees 60 days before classes commence. (See Calendar of Events on Page 22.)

4. An applicant accepted or provisionally accepted after the specific deadline dates outlined in the Calendar of Events is required to pay full tuition fees upon acceptance or provisional acceptance.

5. One-year post-diploma program students pay according to two-level programs.

6. Students who have not paid their fees by the specified deadline dates outlined in the Calendar of Events will be levied a $50 late fee. This fee increases to $150 after 30 calendar days (following and including the first day of classes). Students will be subject to withdrawal for non-payment of fees and their registration cancelled until full payment has been received by the Institute.

7. Course-by-Course day school fees are assessed at $71 per credit to maximum tuition fee of $937 per level.

Payments can be made by Cash, Visa or Mastercard. Cheques or Money Orders should be made payable to the British Columbia Institute of Technology. Please ensure that your correct Social Insurance Number is included with your payment.

Note: There is a $15 charge levied for returned cheques.

Annual Fees

Tuition fees and all related policies are under review for the 1994/95 year by the BCIT Board of Governors and may be subject to change. Current 1993/94 fees are as follows:

	1st Year	2nd & 3rd Year (each)
General Tuition	$1874.00	$1891.00
*Student Activity Fee:		
Sept—Dec/93	50.00	50.00
Jan—May/94	50.15	50.15
Total:	**1974.15**	**1991.15**

First-year Students—
Subject to change for 1994/95

All first-year students must pay their fees according to the deadline dates specified in the Calendar of Events. See page 22.

First Level	
General tuition (includes $75 non-refundable commitment fee)	$ 937.00
*Student Activity Fee:	50.00
Total:	**987.00**
Second Level	
General tuition	$937.00
*Student Activity Fee:	50.00
Total:	**987.00**

Second and Third Year Students—
Subject to change for 1994/95

All second and third-year students must pay their fees according to the deadline dates specified in the Calendar of Events. See page 22.

Third Level	
General tuition	$ 937.00
*Student Activity Fee:	50.00
Total:	**987.00**
Fourth Level	
General tuition	$ 954.00
*Student Activity Fee:	50.00
Total:	**1004.00**

***Note:** Effective January 1994 student activity fee will increase by $0.15

School of Business
All students must pay according to the fee schedule previously stated for the Technology Programs. Specific dates are outlined in the Calendar of Events page 22.

School of Engineering Technology
School of Electrical and Electronic Technology: Electronics Engineering Technology only. All students must pay according to the fee schedule previously stated for the Technology Programs. Specific dates are outlined in the Calendar of Events page 23.

Co-op Fees—Electronics & Robotics **only.** (Per Level)

Note: Coop Program specific dates are outlined in the Calendar of Events. See page 23.

General tuition	$ 469.00
*Student activity fee	25.00
Total:	**494.00**

School of Health Sciences
All students must pay according to the fee schedule previously stated for the Technology Programs. Specific dates are outlined in the Calendar of Events. See page 22.

Nursing only (Fourth and Fifth Terms)
Fourth Level

General tuition (includes $75 non-refundable commitment fee)	$ 937.00
*Student activity fee:	50.00
Total:	**987.00**

One-Year Post-Diploma Programs
Fifth Level—due 60 days prior to the commencement of classes:

General tuition (includes $75 non-refundable commitment fee)	$937.00
*Student activity fee:	50.00
Total:	**987.00**

Sixth Level—due by the end of the first week of classes:

General tuition	$954.00
*Student Activity Fee:	50.00
Total:	**1004.00**

***Note**: Effective January 1994 student activity fee will increase by $0.15.

Course-by-Course Day School Registrants
All part-time day students are required to pay full tuition fees at the time of registration and approval of their courses. Course-by-course fees are assessed at $71 per credit to a tuition maximum of $937 per level. These fees are subject to change for 1994/95. An additional $50 late fee will be assessed if fees are not paid by the due date. Students will be subject to withdrawal for non-payment of fees. This fee increases to $150 after 30 calendar days from the commencement of classes.

Advanced Studies in Business Registrants
All students must pay according to the specified dates outlined in the Calendar of Events. Course-by-course fees are assessed at $92 per credit to a tuition fee maximum of $937 per term/level. These fees are subject to change for 1994/95. Students will be subject to withdrawal for non-payment of fees. Late fee policies also apply to this program.

Provisionally Accepted Applicants
All provisionally accepted applicants whose commitment fee has not been paid immediately will forfeit the seat which has been reserved. Students accepted after the specific deadline dates outlined in the Calendar of Events are required to pay full tuition fees upon provisional acceptance.

International Students
Tuition fees for International Students will be based on a cost recovery formula taking into account the direct and indirect costs of instruction. Except where reciprocal agreements or contracts exist, individual international students enrolled in standard programs will pay according to the current International Student Fee Structure.

FEES AND EXPENSES: FULL-TIME TRADES PROGRAMS

Tuition Fee Policy for Academic Year 1994/95 (subject to change)

Tuition fees are reviewed annually and have been established by the Board of Governors of BCIT and approved by the Ministry of Education for the academic year 1993/94 and are subject to change each academic year.

1. A non-refundable commitment fee of $75 is due upon the applicant's acceptance into first level of the program.

2. An accepted applicant whose commitment fee has not been paid immediately upon acceptance or provisional acceptance, will forfeit the seat which has been reserved.

3. An accepted applicant or provisionally accepted applicant is required to pay the remainder of the fees 30 days prior to the intake start date.

4. Students who have not paid their fees by the end of the first week of classes will be levied a $50 late fee. This fee increases to $150 after 30 calendar days. Students will be subject to withdrawal for non-payment of fees and their registration cancelled until full payment has been received by the Institute.

Annual Fees
(subject to change for 1994/95)
Tuition fees and all related policies are under review for the 1994/95 year by the BCIT Board of Governors and may be subject to change. Tuition fees for fixed-duration training vary according to the length of the program. The 1993/94 tuition fee rate is $27.00 per week or $108.00 per month for most programs.

The Student Activity fee for fixed-duration training programs varies according to the length of the program. The 1993/94 Student Activity Fee rate is $2.00 per week or $8.00 per month. Students are required to pay the Student Activity Fee at the time of registration—including all Apprenticeship students. Effective January, 1994 this fee increases to $2.15 per week or $8.60 per month.

International Students
Tuition fees for International Students will be based on a cost recovery formula taking into account the direct and indirect costs of instruction. Except where reciprocal agreements or contracts exist, individual international students enrolled in standard programs will pay according to the current International Student Fee Structure.

TRADES TUITION FEE SCHEDULE—1994/95 Academic Year *(Subject to change)*

PROGRAM NAME	TUITION FEE	STUDENT*** ACTIVITY FEE	LEARNING MATERIALS	TOTAL FEE
Sea Island Campus				
The following programs are assessed per term:				
Aircraft Maintenance	937.00	30.00		967.00
Avionics	937.00	30.00		967.00
Aircraft Structures	469.00	30.00		499.00
Gas Turbine Technician	567.00	42.00		609.00
Sea Island Program Extensions: (1993/94)Tuition—$66.00 per week				
SA Fees—$ 2.00 per week				
Aircraft Structures Extensions: (1993/94) Tuition—$33.00 per week				
SA Fees—$ 2.00 per week				
Burnaby Campus				
The following programs are assessed by program duration:				
Automated Business Equipment	1080.00	80.00		1160.00
Auto Collision Term 1	533.00	39.00		572.00
Auto Collision Term 2	533.00	39.00		572.00
Auto Collision Term 3	776.00	57.00		833.00
Auto Electronic Tech	459.00	34.00		493.00
Auto Service Tech Term 1	533.00	39.00		572.00
Auto Service Tech Term 2	533.00	39.00		572.00
Auto Service Tech Term 3	533.00	39.00		572.00
Auto Service Tech Term 4	351.00	26.00		377.00
Auto Mechanic	921.00	66.00	150.00	1137.00
Boilermaker	651.00	46.00	150.00	847.00
Carpentry	786.00	56.00	150.00	992.00
Commercial Transport Mech	786.00	60.00	150.00	1050.00
CNC Machinist	378.00	28.00		406.00
CNC Programmer	216.00	16.00		232.00
CNC Programmer—Advanced	216.00	16.00		232.00
Diesel Engine Mechanic	1164.00	84.00	150.00	1398.00
Drafting				
Architectural Design	1080.00	80.00		1160.00
Civil Drafting	1080.00	80.00		1160.00
Mechanical Drafting	1080.00	80.00		1160.00
Structural Drafting	1080.00	80.00		1160.00
Electricity & Industrial Electronics	1110.00	80.00	150.00	1398.00
Electronics Technician (Core) Full-time Day	810.00	60.00	75.00	945.00
Electronics Technician (Core) Part-time Evening (Per Year)	516.00	30.00	40.00	586.00
Heavy Duty Mechanic	840.00	60.00	150.00	1050.00
Inboard/Outboard Mechanic	1002.00	72.00	150.00	1224.00
Indus Maint Mechanic Term 1	656.00	48.00		704.00
Indus Maint Mechanic Term 2	656.00	48.00		704.00
Indus Maint Mechanic Term 3	432.00	32.00		464.00
Ironworking	651.00	46.00	150.00	847.00
Joinery	786.00	56.00	150.00	992.00
Machinist	948.00	68.00	150.00	1166.00
Millwright	1083.00	78.00	150.00	1311.00
Motorcycle Mechanic	948.00	68.00	150.00	1166.00
Painting & Decorating	540.00	40.00		580.00
Plumbing	840.00	60.00	150.00	1050.00
Power Eng. (Gen & Tech)	1080.00	80.00		1160.00
Power Engineering (Power * Process)	1080.00	80.00		1160.00
Security Alarm Installer	540.00	40.00		580.00
Sheet Metal	570.00	40.00	150.00	760.00
Steamfitting	840.00	60.00	150.00	1050.00
Steel Fabrication	651.00	46.00	150.00	847.00
Telecommunication Technician	1080.00	80.00		1160.00
Tool and Die Tech				
Term 1	820.00	60.00		880.00
Term 2	820.00	60.00		880.00
Term 3	540.00	40.00		580.00
Welding Level "B"	432.00	32.00		464.00
Welding Level "C":	810.00	60.00		870.00
Part Programs	varies	varies	varies	varies
Part Program—Welding	varies	varies	varies	varies

* Part Programs—Students are defined as students who are not registered for an entire program and are assessed as stated below:

Initial Registration: $108 per month (4 weeks) and $8 per month S.A. Fee = $116/month (4 weeks)

Jan/94 $108 per month (4 weeks) and $8.60 per month S.A Fee = $116.60/month (4 weeks)

PROGRAM EXTENSIONS	TUITION FEE	SA FEE 1993	TOTAL FEE '93	SA FEE JAN/94	TOTAL JAN/94
1 week	27.00	2.00	29.00	2.15	29.15
2 weeks	54.00	4.00	58.00	4.30	58.30
3 weeks	81.00	6.00	87.00	6.45	87.45
4 weeks	108.00	8.00	116.00	8.60	116.60

***Electrical Core Program: Effective January, 1993, students will be assessed an additional $75 Lab fee.
***Student Activity Fees: Effective January, 1994, the Student Activity Fee will increase to $2.15 per week or $8.60 per month.

Miscellaneous Fees

(fees are subject to change without notice)

Application Fee	$15	
Challenge Exam Fee	Cost of Course	
Duplicate ID Card	$10	
Duplicate Tax Receipt-T2202A	$10	
Duplicate Welding Log Books	$10	
Late Fee	$50	after 1st week of classes
" "	$150	after 30 calendar days
Materials Fee Assessed to Electronic Core Program only:	$75	effective Sept/93
increases to:	$100	effective Sept/9
NSF Cheques	$15	
*Parking:Technology Students	$44	Sept—Dec
" " "	$ 55	January—May
*Parking: Trades Students	$11	monthly
" " "	$4	weekly
*Other Student Parking Rates	$ 3	daily
" " " "	$6	per month
" " " "	$ 5	motorcycle
Reassessment of Marks	$ 25	per course
Appeal of Reassessment	$50	per course
Replacement Diploma/Certificate	$50	
Trades ELTT Programs	$150	Learning Materials
Transcript of Marks	$5	for first copy and
" " "	$1	for each additional copy

* all taxes included

WITHDRAWAL AND REFUND PROCEDURES *(Subject to change for 1994/95)*

How to Withdraw

Students (excluding Apprentices) who wish to withdraw officially from their full program must begin the process by first reporting to Student Services.

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

Refund Policy: Full-Time Technology Students

Refund 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

Refund of fees for students who withdraw after 14 days from commencement of classes:

General Tuition: No refund
Student Activity: Appropriate Student

Activity Fee refunds will be issued by the Institute up to the designated "last day to withdraw to receive a refund."

Refund Policy: Full-Time Trades Students

Students registered in Trade programs of up to and including 20 weeks duration have 14 calendar days after the start of class to withdraw to receive a full refund less $75.

Students registered in Trade programs of 21 weeks or more in duration have 28 calendar days after the start of class to withdraw to receive a full refund less $75.

No refunds are given after these dates. This also applies to students who are involuntarily withdrawn by the department due to poor performance or conduct. After these dates, any request for Student Activity Fee refund must be submitted in writing to the BCIT Student Association Office and the BCIT Library card must be turned in. Withdrawal verification will be made by the BCIT Student Association before processing the refund request.

In all cases, the $75 commitment fee is non-refundable.

TUITION/T2202A TAX RECEIPTS

An official income tax receipt will be mailed by Financial Services on or before February 28. To allow for normal mail delivery, students should wait until March 15 before contacting Financial Services if their tuition fee tax receipt has not been received. A charge of $10 will be levied for a duplicate receipt.

Note: To ensure that your receipts are mailed to the correct address, students should notify the Student Records Office immediately if there has been a change of address. The receipts are mailed to the "mailing address" and not to the "permanent address."

FINANCIAL OBLIGATION TO THE INSTITUTE

No statement of marks, transcript, diploma or certificate will be issued until the student has cleared up all financial obligations to the Institute, such as tuition fees, Library fines, rent and NSF cheques.

CANCELLATIONS

The Institute will make every effort to offer all programs 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.

Calendar of Events—1994/95

*BCIT **is not** open on statutory holidays.*

Note: The following dates apply to all full-time technology programs, however, exceptions to certain programs are identified on subsequent pages. See subsequent pages for Electronics Technology, Cytogenetics Laboratory Technology, Diagnostic Medical Sonography, Medical Laboratory Technology, Medical Radiography, Nursing.

Due to unforeseeable future events, some dates may require adjustment. The Calendar of Events is correct at the time of going to press.

The following dates apply to the majority of full-time technology programs, (including Engineering Technology Entry Program), and intake dates for the majority of Trades Programs beginning in September and January.

1994

TBA	**Spring 1994**	OPEN HOUSE
Wed	**Jun 22**	GRADUATING AWARDS CEREMONIES
Thr-Fri	**Jun 23-24**	SPRING CONVOCATION
Fri	**Jul 1**	CANADA DAY- BCIT CLOSED.
Fri	**Jul 8**	Level 1: Fee deadline for September 6 term start.
Mon	**Aug 1**	B.C. DAY—BCIT CLOSED.
Mon	**Sep 5**	LABOUR DAY—BCIT CLOSED.
Tue	**Sep 6**	Levels 1, 3 & 5: Registration for Technology Programs
Wed	**Sep 7**	Classes begin for Trades and Technology Programs.
Fri	**Sep 9**	Level 3: Fee deadline for September 6 term start.
Tue	**Sep 20**	Last day to withdraw to receive a full refund (less $75).
Tue	**Sep 20**	Last day to apply for course credit/ exemption and to apply to audit same course(s).
Wed	**Sep 21**	SHINERAMA
Mon	**Oct 10**	THANKSGIVING—BCIT CLOSED.
Wed	**Oct 26**	SCHOLARSHIPS & AWARDS CEREMONIES
Fri	**Nov 4**	Level 1: Fee deadline for programs registering January 3/95.
Fri	**Nov 11**	REMEMBRANCE DAY—BCIT CLOSED.
Mon	**Nov 14**	Last day to withdraw in order to receive "W" on transcript for full term courses beginning September 6 (2/3rds through course).
Mon-Fri	**Dec 12-16**	Examinations (most technologies).
Mon	**Dec 19**	Start of Christmas break for technology students.
Fri	**Dec 23**	IN LIEU OF CHRISTMAS EVE—BCIT CLOSED.
Sat	**Dec 24**	CHRISTMAS EVE—BCIT CLOSED.
Sun	**Dec 25**	CHRISTMAS DAY—BCIT CLOSED.
Mon	**Dec 26**	BOXING DAY—BCIT CLOSED.
Tue	**Dec 27**	IN LIEU OF CHRISTMAS DAY—BCIT CLOSED.
Fri	**Dec 30**	IN LIEU OF NEW YEAR'S EVE—BCIT CLOSED.
Sat	**Dec 31**	NEW YEAR'S EVE—BCIT CLOSED.

1995

Sun	**Jan 1**	NEW YEAR'S DAY—BCIT CLOSED.
Mon	**Jan 2**	IN LIEU OF NEW YEAR'S DAY—BCIT CLOSED.
Tue	**Jan 3**	Fall term 1994 marks distribution for Technology Programs.
Tue	**Jan 3**	Trades classes begin.
Wed	**Jan 4**	Technology classes begin.
Fri	**Jan 6**	Fee deadline for January 3 term start.
Mon	**Jan 16**	Last day to withdraw to receive full refund (less $75).
Mon	**Jan 16**	Last day to apply for course credit/ exemption and to apply to audit same course(s).
Fri	**Jan 27**	WINTER CONVOCATION
Thr	**Feb 16**	Last day to withdraw from term A (1/2 term) and receive a "W" on transcript (2/3rds through 1/2 term course(s).
Mon-Fri	**Mar 13-17**	SPRING BREAK (except Electronics Technology and Robotics).
Mon	**Mar 20**	Last day to withdraw from ETE course(s) (Jan 3 start) in order to receive a "W" on transcript (2/3rds through program).
Fri	**Apr 7**	Last day to withdraw to receive "W" on transcript, for full term courses (2/3rds through course)
Fri	**Apr 14**	GOOD FRIDAY—BCIT CLOSED.

Mon	**Apr 17**	EASTER MONDAY—BCIT CLOSED.
Fri	**Apr 21**	End date for ETE Program (Jan 3 start).
Wed	**Apr 26**	Last day to withdraw from term B (1/2 term) and receive a "W" on transcript (2/3rds through 1/2 term course(s).
Mon	**May 1**	Start date ETE
Mon	**May 22**	VICTORIA DAY HOLIDAY—BCIT CLOSED.
Tue-Fri	**May 23-26**	All Levels: Examinations.
Wed	**Jun 21**	GRADUATING AWARDS CEREMONIES
Thr-Fri	**Jun 22-23**	SPRING CONVOCATION
Sat	**Jul 1**	CANADA DAY
Mon	**Jul 3**	IN LIEU CANADA DAY—BCIT CLOSED.
Mon	**Jul 10**	Last day to withdraw from ETE (May 1 start) in order to receive a "W" on transcript (2/3rds through program).
Fri	**Aug 11**	End date for ETE program (May 1 start).

ELECTRONICS ENGINEERING TECHNOLOGY

1994

Fri	**Jul 1**	CANADA DAY—BCIT CLOSED.
Fri	**Jul 8**	Level 1: Fee deadline for September 6 term start.
Fri	**Jul 29**	Application deadline for students on modified program.
Mon	**Aug 1**	B.C. DAY—BCIT CLOSED.
Wed/Th	**Aug 31/Sept. 1**	Timetabling for students on modified programs.
Fri	**Sep 2**	In-person registration for students on modified programs.
Mon	**Sep 5**	LABOUR DAY—BCIT CLOSED.
Tue	**Sep 6**	All Levels: Registration; Coop 1 and 2 begin.
Wed	**Sep 7**	Electronics Technology classes begin.
Fri	**Sep 9**	Level 3, 4 and Coop 1 & 2: Fees due.
Fri	**Sep 9**	Last day to change sections for students on modified programs.
Tue	**Sep 20**	Last day to withdraw to receive full refund (less $75).
Tue	**Sep 20**	Last day to apply for course credit/exemption and to apply to audit same courses.
Wed	**Sep 21**	SHINERAMA
Mon	**Oct 10**	THANKSGIVING—BCIT CLOSED
Wed	**Oct 12**	Last day to withdraw to receive "W" from Term "A" Courses (2/3rds through).
Wed	**Oct 26**	SCHOLARSHIPS & AWARDS CEREMONIES
Fri	**Oct 28**	Term "A" courses end.
Mon	**Oct 31**	Start of Term "B" courses.
Fri	**Nov 11**	REMEMBRANCE DAY—BCIT CLOSED.
Fri	**Nov 30**	Last day to withdraw in order to receive "W" on transcript for full term courses beginning September 6 term start (2/3rds through course).
Thr	**Dec 1**	Level 1: Fee deadline for January 30, 1995 term start.
Fri	**Dec 2**	Term B: Last date to withdraw to receive "W" on transcript (courses 2/3rds through).
Fri	**Dec 16**	Last day of classes before Christmas break.
Fri	**Dec 23**	IN LIEU OF CHRISTMAS EVE—BCIT CLOSED.
Sat	**Dec 24**	CHRISTMAS EVE—BCIT CLOSED.
Sun	**Dec 25**	CHRISTMAS DAY—BCIT CLOSED.
Mon	**Dec 26**	BOXING DAY—BCIT CLOSED.
Tue	**Dec 27**	IN LIEU OF CHRISTMAS DAY—BCIT CLOSED.
Fri	**Dec 30**	IN LIEU OF NEW YEAR'S EVE—BCIT CLOSED.
Sat	**Dec 31**	NEW YEAR'S EVE—BCIT CLOSED.

1995

Sun	**Jan 1**	NEW YEAR'S DAY—BCIT CLOSED.
Mon	**Jan 2**	IN LIEU OF NEW YEAR'S DAY—BCIT CLOSED.
Tue	**Jan 3**	Fall term 1994 marks distribution for Technology Programs.
Wed	**Jan 4**	Classes resume for Electronics Technology classes that began September '94.
Mon-Fri	**Jan 9-13**	All Levels: Exams.
Wed/Th	**Jan 25/26**	Timetabling for students on modified program.
Fri	**Jan 27**	In-person registration.
Fri	**Jan 27**	WINTER CONVOCATION

Mon	**Jan 30**	Level 1: Registration. Classes begin.
Fri	**Feb 03**	Last day to change sections.
Fri	**Feb 03**	All Levels: Fee deadline.
Mon	**Feb 13**	Last day to withdraw to receive full refund (less $75).
Mon	**Feb 13**	Last day to apply for course credit/ exemption and to apply to audit same course(s).
Fri	**Mar 03**	Term A: Last day to withdraw to receive "W" on transcript (courses 2/3rds through).
Wed	**Mar 22**	Term A: Ends.
Thur	**Mar 23**	Term B: Start.
Wed	**Apr 12**	Last day to withdraw to receive "W" on transcript for full term courses (2/3rds through).
Fri	**Apr 14**	GOOD FRIDAY—BCIT CLOSED.
Mon	**Apr 17**	EASTER MONDAY—BCIT CLOSED.
Fri	**Apr 28**	Term B: Last day to withdraw to receive "W" on transcript (courses 2/3rds through).
Mon	**May 22**	VICTORIA DAY HOLIDAY— BCIT CLOSED.
Tue-Fri	**May 23-26**	All Levels: Examinations.
Wed	**Jun 21**	GRADUATING AWARDS CEREMONIES
Thr-Fri	**Jun 22-23**	SPRING CONVOCATION

CYTOGENETICS LAB TECHNOLOGY

1994

Follows regular calendar

Fri	**Jul 1**	CANADA DAY—BCIT CLOSED.
Fri	**Jul 8**	Level 5: Fee deadline for term starting Sep 6, 1993.
Mon	**Aug 1**	B.C. DAY—BCIT CLOSED.
Mon	**Sep 5**	LABOUR DAY—BCIT CLOSED.
Tue	**Sep 6**	Level 5: Registration. Classes begin.
Tue	**Sep 20**	Last day to apply for course credit/exemption.
Tue	**Sep 20**	Last day to withdraw to receive full refund (less $75).
Wed	**Sep 21**	SHINERAMA
Mon	**Oct 10**	THANKSGIVING DAY—BCIT CLOSED.
Wed	**Oct 26**	SCHOLARSHIPS & AWARDS CEREMONIES
Fri	**Nov 11**	REMEMBRANCE DAY—BCIT CLOSED.
Mon	**Nov 14**	Last day to withdraw to receive "W" on transcript.
Mon-Fri	**Dec 12-16**	Examinations.
Mon	**Dec 19**	Start of Christmas Break.
Fri	**Dec 23**	IN LIEU OF CHRISTMAS EVE— BCIT CLOSED.
Sat	**Dec 24**	CHRISTMAS DAY—BCIT CLOSED.
Sun	**Dec 25**	BOXING DAY—BCIT CLOSED.
Mon	**Dec 26**	IN LIEU OF CHRISTMAS DAY—BCIT CLOSED.
Tue	**Dec 27**	IN LIEU OF BOXING DAY—BCIT CLOSED.
Fri	**Dec 30**	IN LIEU OF NEW YEAR'S EVE— BCIT CLOSED.
Sat	**Dec 31**	NEW YEAR'S EVE—BCIT CLOSED.

1995

Sun	**Jan 1**	NEW YEAR'S DAY—BCIT CLOSED.
Mon	**Jan 2**	IN LIEU OF NEW YEAR'S DAY— BCIT CLOSED.
Tue	**Jan 3**	Fall term 1994 marks distribution.
Wed	**Jan 4**	Level 6: Classes begin.
Fri	**Jan 6**	Level 6: Term fee deadline.
Mon	**Jan 16**	Last day to apply for course credit/ exemption and to apply to audit same course(s).
Mon	**Jan 16**	Last day to withdraw to receive full refund (less $75).
Fri	**Jan 27**	WINTER CONVOCATION
Mon-Fri	**Mar 6-10**	Term A, Level 6: Exams.
Mon-Fri	**Mar 13-17**	SPRING BREAK
Mon	**Mar 20**	Clinical orientation phase begins.
Fri	**Apr 7**	Last day to withdraw to receive "W" on transcript.
Fri	**Apr 14**	GOOD FRIDAY—BCIT CLOSED.
Mon	**Apr 17**	EASTER MONDAY—BCIT CLOSED.
Mon	**May 1**	Clinical phase begins.

Mon	**May 22**	VICTORIA DAY HOLIDAY—BCIT CLOSED.
Wed	**Jun 21**	GRADUATING AWARDS CEREMONIES
Thr-Fri	**Jun 22-23**	SPRING CONVOCATION
Sat	**Jul 1**	CANADA DAY—BCIT CLOSED.
Mon	**Jul 3**	IN LIEU OF CANADA DAY—BCIT CLOSED.
Mon	**Aug 7**	B.C. DAY—BCIT CLOSED.
Fri	**Oct 6**	Last clinical day.

Note: There is no summer break for this program.

DIAGNOSTIC MEDICAL SONOGRAPHY

1994

Fri	**Jul 1**	CANADA DAY—BCIT CLOSED.
Fri	**Jul 8**	Level 5: Fee deadline for term starting September 6, 1993.
Mon	**Aug 1**	B.C. DAY—BCIT CLOSED.
Mon	**Sep 5**	LABOUR DAY—BCIT CLOSED.
Tue	**Sep 6**	Level 5: Registration.
Wed	**Sep 7**	Level 5: Classes begin.
Tue	**Sep 20**	Last day to apply for course credit exemption and to apply to audit same course(s).
Tue	**Sep 20**	Last day to withdraw to receive full refund (less $75).
Wed	**Sep 21**	SHINERAMA
Mon	**Oct 10**	THANKSGIVING—BCIT CLOSED.
Wed	**Oct 26**	SCHOLARSHIPS & AWARDS CEREMONIES
Mon	**Nov 14**	Last day to withdraw to receive "W" on transcript.
Fri	**Nov 11**	REMEMBRANCE DAY—BCIT CLOSED.
Mon-Fri	**Dec 12-16**	Examinations.
Mon	**Dec 19**	Start of Christmas Break.
Fri	**Dec 23**	IN LIEU OF CHRISTMAS EVE—BCIT CLOSED.
Sat	**Dec 24**	CHRISTMAS EVE—BCIT CLOSED.
Sun	**Dec 25**	CHRISTMAS DAY—BCIT CLOSED.
Mon	**Dec 26**	BOXING DAY—BCIT CLOSED.
Tue	**Dec 27**	IN LIEU OF CHRISTMAS DAY—BCIT CLOSED.
Fri	**Dec 30**	IN LIEU OF NEW YEAR'S EVE—BCIT CLOSED.
Sat	**Dec 31**	NEW YEAR'S EVE—BCIT CLOSED.

1995

Sun	**Jan 1**	NEW YEAR'S DAY—BCIT CLOSED.
Mon	**Jan 2**	IN LIEU OF NEW YEAR'S DAY—BCIT CLOSED.
Tue	**Jan 3**	Fall term 1994 marks distribution.
Wed	**Jan 4**	Term A, Level 6: Clinical begins.
Fri	**Jan 6**	Level 6: Term fee deadline.
Mon	**Jan 16**	Last day to apply for course credit/exemption and to apply to audit same course(s).
Mon	**Jan 16**	Last day to withdraw to receive full refund (less $75).
Fri	**Jan 27**	WINTER CONVOCATION
Mon-Fri	**Mar 13-17**	SPRING BREAK
Fri	**Apr 14**	GOOD FRIDAY—BCIT CLOSED.
Mon	**Apr 17**	EASTER MONDAY —BCIT CLOSED.
Mon	**Apr 24**	Term A, Level 6: Exams.
Mon-Fri	**May 1-5**	SPRING BREAK
Mon	**May 8**	Term B, Level 6: Start.
Mon	**May 22**	VICTORIA DAY HOLIDAY—BCIT CLOSED.
Wed	**Jun 21**	GRADUATING AWARDS CEREMONIES
Thr-Fri	**Jun 22-23**	SPRING CONVOCATION
Sat	**Jul 1**	CANADA DAY—BCIT CLOSED.
Mon	**Jul 3**	IN LIEU OF CANADA DAY—BCIT CLOSED
Mon	**Aug 7**	B.C. DAY—BCIT CLOSED.
Mon	**Aug 25**	Term B, Level 6: Exams.

MEDICAL LABORATORY TECHNOLOGY

1994

Fri	**Jul 1**	CANADA DAY—BCIT CLOSED.
Fri	**Jul 8**	Level 1: Fee deadline for September 6 start.
Mon	**Aug 1**	B.C. DAY—BCIT CLOSED.
Mon	**Sep 5**	LABOUR DAY—BCIT CLOSED.
Tue	**Sep 6**	Level 1: Registration.
Wed	**Sep 7**	Classes begin.
Tue	**Sep 20**	Last day to withdraw to receive a full refund (less $75).
Tue	**Sep 20**	Last day to apply for course credit/exemption and to apply to audit same course(s).
Wed	**Sep 21**	SHINERAMA
Mon	**Oct 10**	THANKSGIVING—BCIT CLOSED.
Wed	**Oct 26**	SCHOLARSHIPS & AWARDS CEREMONIES
Mon	**Nov 14**	Last day to withdraw to receive "W" on transcript.
Fri	**Nov 11**	REMEMBRANCE DAY—BCIT CLOSED.
Mon-Fri	**Dec 12-16**	EXAMINATIONS
Mon	**Dec 19**	Start of Christmas Break.
Fri	**Dec 23**	IN LIEU OF CHRISTMAS EVE—BCIT CLOSED.
Sat	**Dec 24**	CHRISTMAS EVE—BCIT CLOSED.
Sun	**Dec 25**	CHRISTMAS DAY—BCIT CLOSED.
Mon	**Dec 26**	BOXING DAY—BCIT CLOSED.
Tue	**Dec 27**	IN LIEU OF CHRISTMAS DAY—BCIT CLOSED.
Fri	**Dec 30**	IN LIEU OF NEW YEAR'S EVE—BCIT CLOSED.
Sat	**Dec 31**	NEW YEAR'S EVE—BCIT CLOSED.

1995

Sun	**Jan 1**	NEW YEAR'S DAY—BCIT CLOSED.
Mon	**Jan 2**	IN LIEU OF NEW YEAR'S DAY—BCIT CLOSED.
Tue	**Jan 3**	Fall term 1994 marks distribution.
Wed	**Jan 4**	Level 2: Classes begin.
Fri	**Jan 6**	Level 2: Fee deadline.
Mon	**Jan 16**	Last day to withdraw to receive a full refund (less $75).
Mon	**Jan 16**	Last day to apply for course credit/exemption and to apply to audit same course(s).
Fri	**Jan 27**	WINTER CONVOCATION
Mon-Fri	**Mar 13-17**	SPRING BREAK
Fri	**Apr 7**	Last day to withdraw to receive "W" on transcript.
Fri	**Apr 14**	GOOD FRIDAY—BCIT CLOSED.
Mon	**Apr 17**	EASTER MONDAY—BCIT CLOSED.
Mon	**May 22**	VICTORIA DAY HOLIDAY—BCIT CLOSED.
Tue-Fri	**May 23-26**	Examinations.
Wed	**Jun 21**	GRADUATING AWARDS CEREMONIES
Thr-Fri	**Jun 22-23**	SPRING CONVOCATION

MEDICAL RADIOGRAPHY

1994

Mon	**Oct 31**	Level 1: Full fees due for Term 1 commencing Jan. 3.
Mon-Fri	**Dec 12-16**	Level 2: Examinations.
Fri	**Dec 23**	IN LIEU OF CHRISTMAS EVE—BCIT CLOSED.
Sat	**Dec 24**	CHRISTMAS EVE—BCIT CLOSED.
Sun	**Dec 25**	CHRISTMAS DAY—BCIT CLOSED.
Mon	**Dec 26**	BOXING DAY—BCIT CLOSED.
Tue	**Dec 27**	IN LIEU OF CHRISTMAS DAY—BCIT CLOSED.
Fri	**Dec 30**	IN LIEU OF NEW YEAR'S EVE—BCIT CLOSED.
Sat	**Dec 31**	NEW YEAR'S EVE—BCIT CLOSED.

1995

Sun	**Jan 1**	NEW YEAR'S DAY—BCIT CLOSED.
Mon	**Jan 2**	IN LIEU OF NEW YEAR'S DAY—BCIT CLOSED.
Tue	**Jan 3**	Fall term 1994 marks distribution.
Tue	**Jan 3**	Level 1: Student orientation.
Wed	**Jan 4**	Level 3: Classes start.
Fri	**Jan 6**	Level 3: Term fee deadline.
Mon	**Jan 16**	Last day to withdraw to receive full refund (less $75).
Mon	**Jan 16**	Last day to apply for course credit/exemption and to apply to audit same course(s).
Fri	**Jan 27**	WINTER CONVOCATION
Mon-Fri	**Mar 13-17**	SPRING BREAK
Fri	**Mar 17**	Last day to withdraw to receive "W" on transcript.
Fri	**Apr 14**	GOOD FRIDAY—BCIT CLOSED.
Mon	**Apr 17**	EASTER MONDAY—BCIT CLOSED.
Mon-Fri	**Apr 24-28**	Level 1 & 3: Examinations.
Mon	**May 1**	Level 1 & 4: Practicum commences.
Mon	**May 22**	VICTORIA DAY HOLIDAY—BCIT CLOSED.
Fri	**May 26**	Level 1: Practicum ends.
Wed	**Jun 21**	GRADUATING AWARDS CEREMONIES
Thr-Fri	**Jun 22-23**	SPRING CONVOCATION
Mon	**Sep 4**	LABOUR DAY—BCIT CLOSED.
Tue	**Sep 5**	Level 2: Commences.
Fri	**Sep 8**	Level 2: Fee deadline.
Mon	**Sep 18**	Last day to withdraw and receive full refund (less $75).
Mon	**Sep 18**	Last day to apply for course credit/exemption and apply to audit same course(s).
Wed	**Sep 21**	SHINERAMA
Mon	**Oct 9**	THANKSGIVING—BCIT CLOSED.
Wed	**Oct 25**	SCHOLARSHIPS & AWARDS CEREMONIES
Wed	**Nov 1**	Last day to withdraw in order to a "W" on transcript.
Fri	**Nov 10**	REMEMBRANCE DAY—BCIT CLOSED.
Mon-Fri	**Dec 11-15**	Level 2: Exam week.

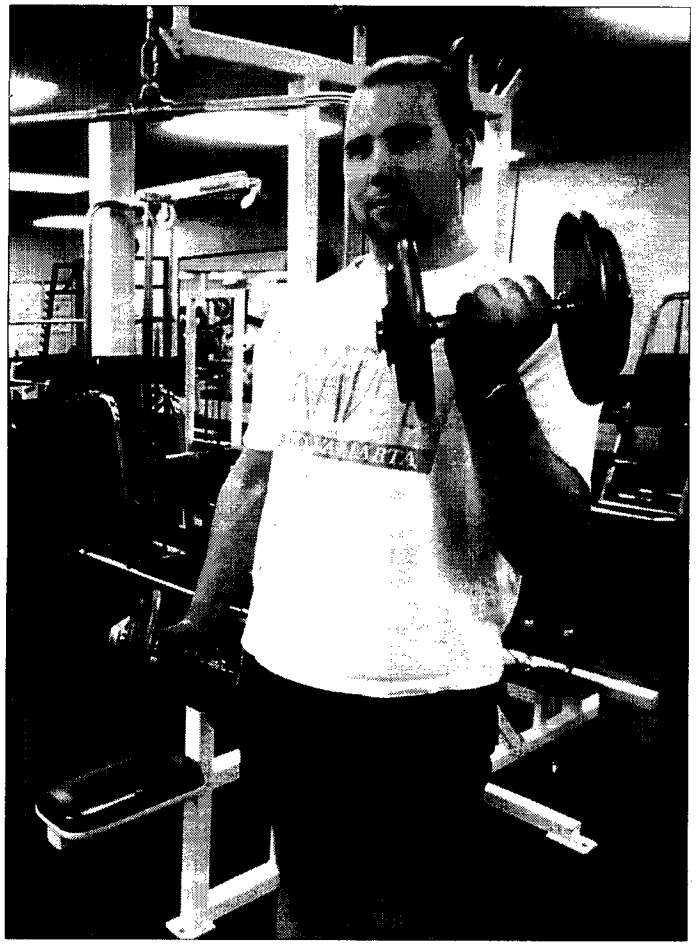
NURSING

1994

Fri	**Jun 18**	Level 1: Fee deadline for term starting Aug. 16.
Wed	**Jun 22**	GRADUATING AWARDS CEREMONIES
Thr-Fri	**Jun 23-24**	SPRING CONVOCATION
Fri	**Jul 1**	CANADA DAY—BCIT CLOSED.
Mon	**Aug 1**	B.C. DAY—BCIT CLOSED.
Mon	**Aug 22**	Level 1: Registration and orientation.
Fri	**Aug 26**	Fee deadline for classes starting Aug 16.
Mon	**Sep 5**	LABOUR DAY—BCIT CLOSED.
Tue	**Sep 6**	Last day to withdraw to receive full refund (less $75).
Tue	**Sep 6**	Last day to apply for course credit/exemption and to apply to audit same course(s).
Wed	**Sep 21**	SHINERAMA
Mon	**Oct 10**	THANKSGIVING—BCIT CLOSED.
Wed	**Oct 26**	SCHOLARSHIPS & AWARDS CEREMONIES
Fri	**Oct 28**	Last day to withdraw to receive "W" on transcript.
Mon	**Nov 7**	Level 1: Fee deadline for January 9/95 term start.
Fri	**Nov 11**	REMEMBRANCE DAY—BCIT CLOSED.
Mon-Fri	**Dec 12-16**	All Levels: Examinations.
Mon	**Dec 19**	Start of Christmas break.
Fri	**Dec 23**	IN LIEU OF CHRISTMAS EVE—BCIT CLOSED.
Sat	**Dec 24**	CHRISTMAS EVE—BCIT CLOSED.
Sun	**Dec 25**	CHRISTMAS DAY—BCIT CLOSED.
Mon	**Dec 26**	BOXING DAY—BCIT CLOSED.
Tue	**Dec 27**	IN LIEU OF CHRISTMAS DAY—BCIT CLOSED.
Fri	**Dec 30**	IN LIEU OF NEW YEAR'S EVE—BCIT CLOSED.
Sat	**Dec 31**	NEW YEAR'S EVE—BCIT CLOSED.

1995

Sun	**Jan 1**	NEW YEAR'S DAY—BCIT CLOSED.
Mon	**Jan 2**	IN LIEU OF NEW YEAR'S DAY—BCIT CLOSED.
Tue	**Jan 3**	Fall term 1994 marks distribution.
Wed	**Jan 4**	Classes resume.
Mon	**Jan 9**	Levels 1-4: Registration and Orientation.
Fri	**Jan 13**	Levels 1-4: Fee deadline.
Mon	**Jan 16**	Level 5: Registration.
Fri	**Jan 20**	Level 5: Fee deadline.
Mon	**Jan 23**	Levels 1-4: Last day to withdraw to receive refund (less $75).
Mon	**Jan 23**	Levels 1-4: Last day to apply for course credit/exemption and to apply to audit same course(s).
Fri	**Jan 27**	WINTER CONVOCATION
Mon	**Jan 30**	Level 5: Last day to withdraw to receive refund (less $75).
Mon-Fri	**Mar 7-11**	SPRING BREAK
Mon	**Apr 7**	Last day to withdraw to receive "W" on transcript.
Fri	**Apr 14**	GOOD FRIDAY—BCIT CLOSED.
Mon	**Apr 17**	EASTER MONDAY—BCIT CLOSED.
Mon-Fri	**May 8-12**	All Levels: Examinations.
Mon	**May 15**	Summer break starts.
Mon	**May 22**	VICTORIA DAY HOLIDAY—BCIT CLOSED.
Wed	**Jun 21**	GRADUATING AWARDS CEREMONIES
Thr-Fri	**Jun 22-23**	SPRING CONVOCATION
Mon	**Aug 21**	All Levels: Registration.
Fri	**Aug 25**	Fee Deadline.
Tue	**Sep 5**	Levels 1-4: Last day to withdraw and receive refund (less $75).
Tue	**Sep 5**	Levels 1-4: Last day to apply for course credit.
Wed	**Oct 25**	SCHOLARSHIPS & AWARDS CEREMONIES
Fri	**Oct 27**	Last day to withdraw and receive "W" on transcript.
Mon-Fri	**Dec 11-15**	All Levels: Examinations.
Mon	**Dec 18**	Start of Christmas break.








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SERVICES

STUDENT SERVICES

The Student Services reception area for Program Advising, Counselling and Financial Aid and Awards is located at the northwest corner, 2nd floor, Building SW1. Hours of operation are 0830—1630 Monday—Friday, however, evening services are available at various times of the year. Phone 434-3304 for information.

Staff

Val Karpinsky, B.A. (Hons.), Director, Enrolment Management Project
Randy Friesen, Marketing, Enrolment Management Project
Jim Mitchell, Acting Director, Student Services
Sandie Mooney, Office Administrator
Jan Wadsworth, Clerical Supervisor
Mariana Aussem, Clerical Support
Joyce Davidson, Admin Assistant, Services for Students with Disabilities
Lisa Lawley, Clerical Support
Darlene Napper, Clerical Support
Lisa Pedersen, Clerical Support
Muriel Shaw, Clerical Support

PROGRAM ADVISING

Program Advisors provide information through an interview process about programs, learning and career opportunities for full and part-time students. We assist students with program selection and provide information about skill requirements and occupations. Students with undefined goals are referred to Counsellors for career planning. We acquaint prospective students with Institute services and facilities and also participate in Secondary School visits throughout the province. We look forward to hearing from you. Our phone number is 434-3304. Students outside the Lower Mainland may reach us by using the Toll-Free Line: 1-800-667-0676.

Program Advisors

Raelene Christie, B.A., Coordinator
Linda Becerra
Chikako Fong, B.A.
Midge Mason, B.A., B.Ed.
Pat McCall, B.A.

Program Advisors—Part-time Studies

Sandra Arnott, Business
Chris Lloyd, Dipl.T., Business
Ann McNaughton, Cert., Engineering Technology and Trades

COUNSELLING

Counsellors assist students to develop strategies to enhance educational performance and maximize the student experience. They assist students with decision-making, problem-solving and achieving career/educational goals.

Appointments

For appointments call Student Services Reception at (604) 434-3304, Fax (604) 433-1184, or TDD (604) 432-8954. Our hours are Monday to Friday, 0830—1630. Enrolled students can drop in Monday—Friday, 1030—1430. Our office is located in Building SW1, room 2300.

Some evening appointments are available. Students in crisis can be seen with a minimum of delay. Counselling services are free of charge.

Student Orientation

A counsellor welcomes each group of newly enrolled students encouraging them to take advantage of the full range of services at BCIT. Special sessions are offered for out-of-towners, returning adult students and disabled students.

Success Skills Workshops

Free noon-hour and afternoon workshops are offered for students. Topics include:

- study skills
- time management
- coping with test anxiety
- strategies for working on team projects
- stress management
- assertiveness
- job search strategies
- post-diploma career options.

Group Information Sessions

We offer weekly and monthly daytime information sessions for prospective students on business, health sciences, engineering technology and electronics programs.

What to Discuss with Counsellors

Educational Success

As you return to school, you may want to discuss your background, your progress and to polish your study, time management and test-writing skills. You can also develop strategies for increasing your concentration and motivation. Developing good relationships with your instructors and clarifying your rights and responsibilities may be of importance to you. If you are considering withdrawal from your program, you can begin by discussing your options and initiating the paperwork with us.

Personal Challenges

Personal concerns can interfere with your success as a student. You may have recently experienced a life change or be coping with more stress than usual. You may be concerned about your communication skills, assertiveness and the quality of your relationships with family and friends. You may be dealing with a loss through death or separation, or you may feel that your level of confidence is affecting your ability to set priorities and make decisions. You may just be feeling lonely and want to talk to someone.

Career Planning

If you want to make a change and select the right career, we can assist you with clarifying your interests, skills, aptitudes and values. You might want to make a decision and plan for short-term and long-term career and life goals. You can also plan your job search and assess your career and educational options after graduation.

Crisis Counselling

If you have experienced an unexpected or traumatic event in your life, it is sometimes difficult to make good decisions. Come talk to us.

Student Life and Career Resources

Career planning, occupational and student life information is available to pick-up and for reference. Videos, brochures and career profiles on BCIT programs and other educational and career opportunities are also available.

Career Search Workshops (HRMG 0315)

This 12-hour course encourages you to explore your individual interests, aptitudes, values and career goals. Confirm costs and register through Part-time Studies, 434-1610 or 687-4666.

Consultation

Faculty and department members are helped to address student concerns through confidential referral to counselling. Counsellors provide support and information to community agencies, schools and post-secondary representatives for students interested in attending BCIT. Services are available over the telephone or in person.

Confidentiality

All information gathered in counselling, including the fact that the student has come to counselling services, is held in strict confidence. No information is released to Institute administrators, instructors, parents or outside agencies, without authorization from the student, except as required by law.

Services for Students with Disabilities

Please contact us if you require classroom accommodation or any other support service. Services include:

- agency liaison
- tutoring
- taped books
- timetabling
- exam support
- interpreters
- notetaking
- enlarged print
- proof readers
- assistance with campus access.

It is recommended that as much lead time as possible be given to guarantee support services. This is particularly important for

taped books and visual language interpreting services.

A current assessment from students with learning disabilities is helpful in determining learning strengths and identifying appropriate support services. In order to qualify for support services, students require documentation of their disability from an appropriate professional.

Counselling Staff

Counsellors have Masters degrees in Counselling Psychology and are committed to a professional code of ethics.

Shirley Coomber, B.Ed., M.Ed., A.R.W.,
Counsellor/Coordinator Counselling and Services for Students with Disabilities
Stu Gibbs, B.A., M.S.Ed.,
Counsellor, Liaison Trades
Heather Hyde, B.A., M.A., R.Psych.,
Counsellor, Liaison Health
Derek McLauchlan, M.A., Ph.D.,
Learning Specialist,
Services for Students with Disabilities
Howard Peto, B.S.A., M.Ed.,
Counsellor, Liaison Business
Jean Spence, B.A., M.Ed.,
Counsellor, Liaison Engineering
Joyce Davidson, B.A.,
Administrative Assistant,
Services for Students with Disabilities

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 $950 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.

Entrance Awards

Technology and Trades students entering BCIT immediately after B.C. Grade 12 can apply for President's Entrance Awards valued at one year's tuition. Applications are available from high schools. Students coming to BCIT after taking one or more years since high school for activities such as work or attending another post-secondary institution can apply for BCIT Alumni Entrance Awards. Applications can be obtained from the Alumni Affairs Office at 432-8847.

Up to 40 Canada Scholarships valued at $5000 each are awarded to students who are entering specified BCIT Engineering Technology related programs. Eligible programs are: Aircraft Maintenance Engineering, Avionics, Biomedical Engineering, Biotechnology, Building, CAD/CAM, Chemical Sciences, Civil & Structural, Computer Systems, Electronics Technology, Fish, Wildlife & Recreation, Forestry, Food Technology, Mechanical, Mining, Occupational Health and Safety, Petroleum, Plastics, Robotics and Automation, Surveying and Mapping, Wood Products Manufacturing. Canada Scholarship applications are available from high schools and also from the BCIT Financial Aid and Awards office.

Information on Entrance Awards for women students entering non-traditional Technology and Trades programs and special awards for students entering Food Technology, Mining, and Occupational Health & Safety programs, can be obtained from Financial Aid & Awards.

B.C. Student Assistance Program

The B.C. Student Assistance Program includes three types of assistance: Canada Student Loans; B.C. Student Loans; and Equalization Payments. The maximum assistance a student is eligible for varies according to program length and whether a student has dependents. Based on 1992/93 guidelines, the maximums are:

PROGRAM LENGTH (WEEKS)	WITHOUT DEPENDENTS	WITH DEPENDENTS
13	$2808	$4303
17	$3672	$5627
22	$4752	$7282
30	$6480	$9930
34	$7344	$11254
39	$8424	$12909
43	$9288	$14233
52	$1123	$17212

Note: "Dependents" = dependent children. 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 with financial needs which 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 BCIT Employment Placement Services beginning in September.

BCIT Bursaries

BCIT 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.

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. Trades students must also complete an application to be considered for bursaries. The Trades 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.

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 432-8555 or visit the Financial Aid Reception in Student Services located in Building SW1, Room 2300. Hours are 0830 to 1630, Monday to Friday.

Staff

Jennifer Orum, B.Ed., M.A., Coordinator
Jim Anderson, B.A., Senior Advisor
Siok Ang, B.A.(Hons.), D.P.M., EXD,
Advisor, Technologies
Angie Chan, Dipl.T., Advisor
Cathy Schweers, Advisor
Avalon Tagami, Advisor
Hanne Logan, Senior Financial Aid Assistant
Jennifer Higgins, B.A. (Hons.),
Financial Aid Assistant
Lisa Ho, Financial Aid Assistant

GRADUATING AWARDS

Honor Awards

The Governor General's Bronze 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 December graduates from the Electronics Technology and December graduates from Nursing.

The **Lieutenant Governor's Silver Medals** are awarded for academic excellence and contribution to the Institute and/or the community at large. Two are presented each year, one to a Trades Program graduate and the other to a graduate of an Advanced Diploma or Post-diploma Program.

The **Board of Governors' Citizenship Award** is presented to a graduating Technology student who has demonstrated outstanding leadership and service to peers, faculty and staff, and who has achieved at least second class standing.

The **President's Award** is presented to a graduating Technology student with a first class or high second class standing who has a record of active participation in student activities, including ones that have brought recognition to the Institute.

The **Deans' Awards** are presented to the most outstanding student in each of the five Schools: Business, Electrical and Electronic Technology, Engineering Technology, Health Sciences and Trades Training.

Academic Awards

Academic Awards are presented annually to students who achieve the highest academic standing in the final two academic terms of their programs of studies. The following awards were presented at the June 1992 Graduating Awards Ceremony.

School of Business

Administrative Systems
The Human Resource Systems Award
The Management Systems Graduating Award
The Business Administration Double Diploma Award
The Operations Management Graduating Award
The Vancouver Transportation Club Award in Transportation-Logistics Management
The International Trade Graduating Award

Broadcast Communications
The British Columbia Association of Broadcasters Award

Financial Management
The International Financial Centre Vancouver Award in Investment Management
The Chevron Canada Taxation Award
The Institute of Chartered Accountants of B.C. Award in Advanced Accounting
The Society of Management Accountants of British Columbia Award
The Royal Bank Finance Award

Marketing Management
The Real Estate Council of British Columbia Award in Real Estate Studies
The Palmer Jarvis Advertising Award in Advertising and Sales Promotion
The Right Associates Award in Professional Sales
The Rogers Cablesystems Inc. Award in Technical Sales and Marketing
The Federal Business Development Bank Award in Small Business Development
The Ryan Schlyecher Memorial Award in Tourism

School of Electrical and Electronic Technology

Electronics Engineering
The Instrument Society of America Award in Process Automation and Instrumentation
The MacDonald, Dettwiler and Associates Limited Award in Computer Control Electronics
The Telecommunications Graduating Award

School of Engineering Technology

Biological Sciences
The Dollar Food Manufacturing Inc. Award in Food Technology
The Biotechnology Graduating Award

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

CAD/CAM
The Vancouver Women's ORT Award

Chemical Sciences
The FMC of Canada Limited, Chemical Products Group Award
The Canadian Society for Chemical Technology Award in Environmental and Industrial Chemistry

Civil and Structural
The Sandwell Inc., Colonel W.G. Swan Award

Computer Systems
The Finning Ltd. Award
The Computer Systems Award in Information Systems
The Computer Systems Award in Microcomputer Systems
The Computer Systems Award in Expert Systems
The Motorola Mobile Data Division Award in Data Communications

Geographic Information Systems
The Urban and Regional Information Systems Association, B.C. Chapter/ Pacific Institute of Cartographers Award

Industrial Education Teacher Education
The Industrial Education Teacher Education Graduating Awards

Mechanical
The Mechanical Design Graduating Award
The Canadian Manufacturers' Association Award in Manufacturing

Mechanical Systems
The Mechanical Contractors Association of B.C. Award in Mechanical Systems

Mining
The Canadian Institute of Mining and Metallurgy, Vancouver Branch Award

Petroleum
The Westcoast Energy Inc. Award

Plastics
The Plastics Technology Graduating Award

Quality Assurance and Nondestructive Testing
The Quality Assurance and Nondestructive Testing Graduating Award

Renewable Resources
The Council of Forest Industries of B.C. Award in Forestry
The Fish, Wildlife and Recreation Graduating Award

Robotics and Automation
The Robotics and Automation Technology Graduating Award

Surveying and Mapping
The Corporation of British Columbia Land Surveyors, George New Campass Award

Wood Products Manufacturing
The Council of Forest Industries of B.C. Award in Wood Products Manufacturing

School of Health Sciences

Biomedical Engineering
The Biomedical Engineering Technology Graduating Award

Electroneurophysiology
The Electroneurophysiology Faculty Book Prize

Environmental Health
The Environmental Health Graduating Award

Medical Laboratory Technology
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 Graduating Award

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

Achievement Awards

Achievement Awards are presented to students who receive outstanding marks in specific second-year courses or who have demonstrated a combination of high academic standing, leadership, service and/or all-round achievement.

School of Business

Administrative Systems

The Joanne Gray Memorial Award of Excellence
The Management Systems Students' Award
The Canadian Association for Production and Inventory Control, Vancouver Chapter Awards
The Canadian Materials Handling & Distribution Society B.C. Chapter Award
The Canadian Society of Industrial Engineers
The Canadian Transportation Education Foundation Awards

Broadcast Communications

The British Columbia Motion Picture Association, Jack Gettles Memorial Award for Creativity in Television
The Rogers Broadcasting Limited Award of Excellence in Broadcast Communications
The Canadian Broadcasting Corporation Award in Television
The Gastown Post and Transfer Award in Television
The Association of Broadcast Communicators, Eileen Fox Memorial Award

Financial Management

The Certified General Accountants Association of B.C. Awards
The Institute of Chartered Accountants of B.C. Award
The Wolverton Securities Ltd. Award in Finance
The Society of Management Accountants of British Columbia Award
The Canadian Association of Financial Planners, Pacific Chapter Award
The Bay Street Game Awards

Marketing Management

The National Real Estate Service, Carl G. Nielsen Memorial Awards
The Canadian Tire Award in Advertising and Sales Promotion
The Prime Copy Office Systems Ltd. Award in Technical Sales and Marketing
The Peace Country Reindeer Association Award in International Marketing

School Awards

The BCIT Alumni Association Award
The Cruise Ship Centers Achievement Award in Small Business

School of Electrical and Electronic Technology

Electronics Engineering

The Western Canada Telecommunications Council, R.C. Eldridge Award in Technical Writing
The Norpac Controls Ltd. Award in Process Automation and Instrumentation
The Galvanic Analytical Systems Ltd.Award in Process Automation and Instrumentation
The Isabel Verner Book Prize

School of Engineering Technology

Biological Sciences

The B.C. Food Technologists Award in Food Technology

Building

The Clay Brick Association of Canada Award
The Quantity Surveyors Society of B.C. Awards
The Construction Specifications Canada (Vancouver Chapter) Special Projects Award

Chemical Sciences

The Can Test Limited Award in Environmental and Industrial Chemistry
The Analytical Service Laboratories Limited Award in Environmental and Industrial Chemistry

Civil and Structural

The Charles J. Duncan Memorial Award Sponsored by the Dominion Company and the Duncan Family
The Canada Scaffold Supply Co. Ltd. Formwork Design Prize
The Associated Engineering (B.C.) Ltd. Award

Computer Systems

The Fluor Daniel Wright Award
The MPR Teltech Ltd. Achievement Award

Mechanical

The Institution of Mechanical Engineers, Western Canada Branch, Commander S.M. Terry Memorial Award

Mechanical Systems

The American Society of Heating, Refrigeration and Air Conditioning Engineers, B.C. Chapter Award

Petroleum

The Fluor Daniel Wright Award

Plastics

The Society of the Plastics Industry of Canada, B.C. Chapter Award

Renewable Resources

The Canadian Institute of Forestry, Vancouver Section Award

Surveying and Mapping

The Canadian Institute of Surveying and Mapping Membership Award

Wood Products Manufacturing

The C.W. Clasen Recruiting Services Awards
The Phillip A. Tindle Achievement Award

School Awards

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

School of Health Sciences

Environmental Health

The Environmental Health Achievement Award
The Herbison Award

Nursing

The Associate Dean's Award for Proficiency in Bedside Nursing
The Registered Nurses Association of B.C. Student Professional Award
The C.V. Mosby Company Ltd. Book Award
The Addison-Wesley Publishers Limited Book Award
The Term 5 Achievement Award

Medical Laboratory Technology

The Coulter Electronics of Canada Award in Haematology
The Metro-McNair Clinical Laboratories Ltd. Award in Clinical Chemistry
The Metro-McNair Clinical Laboratories Ltd. Award in Clinical Microbiology
The Ortho Diagnostic Award in Immunohaematology
The Analytab Products Paraplast Award in Histotechnology
The Organon Teknika Award in General Proficiency
The Medical Laboratory Faculty Special Achievement Award
The Vancouver General Hospital Medical Advisory Committee Award

Medical Radiography

The B.C. Association of Medical Radiation Technologists Foundation Award
The Vancouver General Hospital Medical Advisory Committee Award
The Dupont Award for Excellence in Clinical Practice

Nuclear Medicine Technology

The Metro-McNair Clinical Laboratories Ltd. Award for Clinical Excellence
The Vancouver General Hospital Medical Advisory Committee Award for General Proficiency

Prosthetics and Orthotics

The Mr. and Mrs. J.A. Pentland Achievement Award

School Awards

The BCIT Alumni Association Award
The School of Health Sciences Dean's Recognition Award

INTERNATIONAL EDUCATION

BCIT's International Education Department develops and coordinates international activities with industry, government agencies and other agencies in B.C., Canada and overseas. Department activities provide opportunities for BCIT faculty, staff and students overseas, resulting in long-term international relationships which promote BCIT's competitiveness in technical training in the world market.

The department is involved in international development projects, contract education training and related activities. These activities bring to BCIT an increasing number of international students studying in full-time programs. Their presence on campus provides excellent opportunities for inter-cultural understanding, development of an international perspective and experiences among domestic and international staff and students.

The office is located in the NE1 Building (J.W. Inglis Building) Room 201. Tel: (604) 432-8816.

Staff

Henry Arthur, Director, Tel. (604)432-8622
Marianne Gottfried, Marketing Coordinator, Tel. (604)432-8969
Donna Hooker, Coordinator, International Training Projects, Tel. (604)432-8842
Gail Johnson, Project Assistant (Acting) Tel. (604)432-8232
Jeanne Kurz, Technical Training Specialist, Tel. (604)432-8968
Lexie McManus, Project Secretary, Tel. (604)432-8966
Mark Eric Miller, Manager Tel. (604)432-8964
Mary-Ann Moysiuk, International Student Advisor, Tel. (604)432-8475
Margaret Neylan, Health Specialist, Tel. (604)432-8583
Rhett Wade, Technical Training Specialist, Tel. (604)432-8674
Allan Williams, Consultant Tel. (604)432-8965
Teana Wong, Administrative Assistant Tel. (604)432-8816

LIBRARY SERVICES

The library plays a leading role in the educational process by providing the BCIT community with access to current materials using the latest information technology, assistance in retrieving information, and instruction in research methods. Library holdings include approximately 500 thousand books, periodicals, pamphlets, and non-print media. Major strengths are found in the collections of technical reports, standards, Statistics Canada documents, topographical and land use maps, legal and legislative materials and microcomputer software. There is a large microcomputer lab and equipment for viewing video and film in the lower level of the library. The library is wheelchair accessible and a print-to-voice machine is available for those with visual impairment.

Librarians give library research instruction in the use of DOBIS (the online catalog of the library's holdings), periodical indexes in print format and on CD-ROM and other specialized sources of information. As well as individual and group instruction, there are printed guides to various information sources, facilities and services.

Library Hours

September to May (subject to change)
Main Library

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

Summer hours vary—check for times.
For loans, overdue and hold information Tel.432-8370
For Library hours Tel.432-8557
For reference service Tel.432-8371

Overdues, Fines, and Replacement Policies

The purpose of fines is to protect the rights of all library patrons and provide an incentive to return books promptly. Overdue notices are mailed out. Overdue loans result in the blocking of further loan transactions. A non-refundable fee covers the purchase and processing of a replacement copy.

No statement of marks, diploma or certificate will be issued until the student settles all financial obligations. Overdue fines are 50¢ per day; 30¢ per hour for reserve material.

Faculty and Staff

TBA, Institute Librarian
Margot Allingham, B.A., B.L.S., M.L.S. Reference Librarian—Engineering
Yu-Mei Choi, B.S.Sc., M.L.S., Head Cataloguer
Ana Ferrinho, B.A., M.L.S., Reference Librarian—Health
Anthony Kelly, B.A., M.L.S., Reference Librarian—Trades
Frank Knor, Dipl.T., B.Ed., B.L.S., M.L.S., Reference Librarian—Electronics/ Current Awareness Coordinator
Merilee MacKinnon, B.A., M.L.S., DOBIS Systems Librarian
Robert A. Roy, B.A., M.A., B.L.S., Public/Technical Services Coordinator
Gerry Weeks, B.A., B.L.S., M.L.S., Reference Librarian—Business/ Reference Services Coordinator

MEDICAL SERVICES

A drop-in medical office, located in the Student Activity Centre, is staffed by physicians and nurses Monday to Friday, 0830-1630.

Medical Services operates as a regular doctor's office as well as providing many additional services. These can include immunizations and allergy shots, some free medications, STD (sexually transmitted disease) information and testing, weekly wart clinics, pregnancy tests, pap tests, ice bags and tensors, bandages, crutches and canes, blood pressure checks, literature and pamphlets on health issues and beds for resting.

A psychiatrist, physiotherapist and dermatologist are also available. All visits are strictly confidential. Referral to either the physiotherapist, psychiatrist or dermatologist is through Medical Services or your own physician. The physiotherapist's office is adjacent to the Medical Services facility.

All patients who wish to see a doctor must have valid medical coverage. Information and application forms regarding the Medical Services Plan of B.C. and private medical insurance coverage are available as well as information about premium assistance (reduced rates) for eligible low income students.
EMERGENCIES ARE ALWAYS SEEN.

Confidentiality of Medical Records

All medical records are confidential. Information will not be released to anyone without the written consent of the patient.

For more information on Medical Services please visit us or call 432-8608.

FIRST AID

First aid attendants are on call as follows:

Monday—Friday	0700-2200
Saturday	0800-1530

Attendants are located in Building NE16

Emergency: local 8820
Non-emergency: local 8872

When first aid attendants are on duty:

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 911 advising them to enter the campus via Willingdon/Goard Way;

(iii)Call security cellular 230-0306, give location of patient and request security to meet ambulance at Willingdon/Goard Way entrance and escort ambulance crew to patient.

If patient is mobile, escort to first aid attendant in Building NE 16.

When first aid attendants are not on duty:

If injury or health problem is life threatening or if patient otherwise requires medical treatment call ambulance at 911.

Sea Island Campus

Monday—Friday 0800-1600

CHILDCARE

The BCIT Childcare Centre opened September 1990. The centre houses 25 children, ages 3-5, with the majority of seats being allocated to students' children.

The centre has been designed by Mineo Tanaka Architects using a premanufactured building, and is located in the SW7 Building.

Plans are in the works for additional facilities to include two play spaces, an observation building for Early Childhood Educators, and a main care building to house 1-3 year olds and infants. Plans also include a drop-in program for children whose parents are at night school.

The Institute and the Student Association are very pleased that this important service is now available to our students. For more information on the Childcare Centre, please call Nora Lee Goodwin at 432-8919.

HOUSING

The BCIT Housing Office, located on the Burnaby Campus, is available to assist students in finding suitable accommodation in the greater Vancouver area.

Maquinna Residence

When you are accepted into a full-time BCIT program of four months duration or longer, you are eligible to live at Maquinna Residence.

The Residence is situated on campus, a short walk from classes, the Student Centre, recreational facilities and medical services. It accommodates 336 residents in seven low-rise, split level buildings. The buildings consist of town-house style units where 12 students live together sharing kitchen and cooking facilities, living/dining rooms, washrooms and laundry facilities. Residents may choose all female, all male or co-ed units.

Each house has a Residence Advisor who is there to help with counselling and advice, in case of emergency and to facilitate social events.

Each resident has a private bedroom, fully carpeted and comfortably furnished with a single bed, desk, dresser, mirror, two chairs and a desk lamp. Ample closet space is provided.

Cost

The cost of a room at Maquinna Residence in 1993/94 is $335 per month. This does not include meals, as students do their own cooking. Cost is subject to change.

How to Apply

When you are advised of your academic acceptance by BCIT, you will also receive an application form for Maquinna Residence. Residence accommodation is limited and you should return your completed Maquinna Residence application to the Housing Office as soon as possible.

Off-Campus Housing

Since residence accommodation is limited, many BCIT students live off campus. The Housing Office provides a free listing service of local short term and long term accommodation to BCIT students. General information, area maps and a telephone are available to students seeking accommodation.

Costs for off-campus accommodation vary according to the type and location you select. Average monthly costs in 1993 were approximately:

Room and Board	$500
Sleeping Room	$275
Room with Cooking Facilities	$325
Basement Suites	$425
Apartments	$525
Shared accommodation	$350

The off-campus housing service is available year round. Weekend and evening service is available at certain times of the year. To check Housing Office hours of operation call 432-8677. Due to the high turnover of off-campus accommodation, listings cannot be mailed out. Such lists would be out of date by the time you received them. Landlords and tenants also prefer to meet each other before entering into an agreement.

The Housing Office staff also assists students unable to find accommodation before arriving in the Lower Mainland by referring them to short term accommodation in the area. Please contact the Housing Office for further information. You may also wish to enlist the help of a friend or relative living in the Lower Mainland for assistance in securing temporary accommodation.

Married Student Accommodation

BCIT does not have residence accommodation for married students or students with dependents. The off-campus housing service includes listings appropriate for families.

Office Hours: Monday to Friday
0830—2200 (Sept.-May)
0830—1630 (June- August)

Address: 4200 Willingdon Avenue
Burnaby, B.C.
V5G 4J3

Location Southwest corner of
Burnaby Campus
Building SW11,
Salish House
Maquinna Residence

Telephone: (604) 432-8677
Fax: (604) 438-4174

FOOD SERVICES

Campus Cafe (SE12)

Monday—Thursday	0700—2100
Friday	0700—1700
Saturday	0800—1430

Town Square Café (SE2)

Monday—Thursday	0700—2100
Friday	0700—1530
Saturday	CLOSED

E.T.C. Building (SE1)

Monday-Thursday	0700—2100
Friday	0700—1530
Saturday	CLOSED

Road Runner (SW1, room 2322)

Monday—Thursday	0700—2100
Friday	0700—1530
Saturday	CLOSED

J.W. Inglis Building (NE1)

Monday—Thursday	0700—2100
Friday	0700—1530
Saturday	0800—1300

Gourmet coffee, deli sandwiches, salads made to order and many other specialties are available in The Town Square Café and the J.W. Inglis cafeteria.

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 SE 6.1, Tel. 432-8719. Parking Office hours are 0800-1600, Monday to Friday.

Improperly parked vehicles or vehicles not displaying valid permits are subject to impoundment at the owner's risk and expense.

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 from the cashier in the registration area in Building SW1.

Parking for Disabled Students

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.

SECURITY

The security office is located in SE12-135 and 131 (off the Central Stores loading dock). Security is responsible for:

- Escorts—
  call Security on cellular #230-0306
- Locking and unlocking schedules
- Lost and Found—
  call local 8356, located in SW1-1215
- Investigations of personal and property crimes
- Crime prevention programs
- Maintaining accessible statistics

Security can be contacted on Cellular: 230-0306, 24 hours all year round.

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. The cost of monthly transit passes varies according to zones travelled; passes are available from "This 'n That" stores on campus and from the Student Association in the SAC.

For information about bus routes, fares and schedules within the Vancouver Regional Transit System, call the Metro Transit Information line at 261-5100. You can also pick up bus schedules for Greater Vancouver in the Maquinna Residence.

EMPLOYMENT PLACEMENT SERVICES (EPS)

SW1 Building Room 2160
Tel. 432-8666
Fax: 435-3122
Open: Mon—Thr 0930-1600
Fri 0930-1500

EPS offers employment services to both Trades and Technology students and alumni. Students must register with the EPS office before they may access the computerized Job Information Centre. The office is open year-round, and posts Technology and Trade related job opportunities for full-time, temporary and summer employment. Part-time positions suitable for students are posted outside the EPS office. Resume and letter writing assistance are available by appointment.

Staff

Amanda Hill, B.A., Manager
Phillipa Dermott,
Employment Placement Officer

BOOKSTORE

Burnaby Campus

Not only does the bookstore located in Building SE14 on Roper Avenue carry the texts designated essential by the academic departments, we also have competitively priced school and drafting supplies. We're very pleased to offer a large selection of low-priced software, but contractual obligations require proof of BCIT enrolment to obtain educational pricing.

At time of publication, hours of operation are under review, but there are several extended openings throughout the year to coincide with specific class starts. Please call 432-8379 to ascertain these ad hoc openings. There are always extended hours for the September and January term start-ups.

The Burnaby Bookstore takes personal cheques, VISA, MasterCard and Interac Direct. Credit card signatures will be verified. If a company wants to set up a charge account for a student for texts and supplies, please fax Lucille at 432-7923 with details of student, course(s) and invoicing information PRIOR to first class.

Downtown Education Centre

Call DEC at 687-4666 to ascertain hours of operation. Books at DEC are only available for DEC classes, not Burnaby classes.

Satellite Locations

Operational difficulties, staffing levels, and expense preclude a duplication of textbook sales at all nine satellite campuses. PLEASE DO NOT ASSUME THAT TEXTS WILL BE AVAILABLE IN SURREY, LANGLEY, etc. Decisions regarding service levels have to be made based on enrolment levels, and such information is often not available until close to class startup. Call 432-8379 for details.

The returns policy is generous but not open-ended. **Please do not hold onto a text if your class is cancelled or you withdraw. Texts often change from term to term, and you don't want to be stuck with a text from a previous term.**

Returns

A **full refund**, via cheque or credit voucher, is available for texts returned within 30 calendar days of the register receipt if

- You provide written proof from **registration department** of class withdrawal, class cancellation, or course credit.
- **Texts must be in unmarred condition (no names in pencil or ink, bent covers, marks or highlighting).**
- Refunds are not granted if you purchase books in error. It is **strongly recommended** that you attend class before making a purchase.

RECREATION AND ATHLETICS

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 with 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 super circuit, weight training, cardio area which includes bikes, step machines and more. Four tennis courts, two sports fields, a fitness trail 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	0900-1700
Sunday	0900-1700

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

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 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

Book seven full days in advance 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. 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 programs
We are 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 into or call the Recreation and Athletic Services office located in the lobby of the SAC building, telephone 432-8287.

Intramurals
Leagues for volleyball, indoor soccer, ice hockey, non-contact floor hockey, wallyball, flag football, are organized for school breaks, evenings and early mornings. For further information, pick up one of our Fall or Winter Program Guides.

Instructional programs
Courses in relaxation, massage, squash, racquetball, ballroom dancing, golf, etc., are on-going during the school year. For further information, pick up one of our program guides.

Aerobic fitness classes
A variety of classes is offered each term, mornings and afternoon. You can pay a per term fee or drop in at very reasonable rates.

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: $10 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. AIR BCIT is a popular fall event and SKI BCIT is our major winter event. We can assist you to schedule non-competitive tournaments within your technology or trade. If you have any interests that you feel may attract other students or staff, drop into or call the Recreation and Athletic Services Office at 432-8287.

Swimming pool tickets
The Recreation and Athletic Services Department makes available pool tickets for the following pools:
Canada Games Pool (New Westminster):
10 tickets/$24.00.
Both Burnaby Pools, Bonsor and C.G. Brown: 10 tickets/$16.00.
Prices subject to change.

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 athletic programs for men and women:
- Badminton
- Soccer
- Volleyball.

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

Recreation and Athletic Services
(Program Office)
Tel. 432-8287 or 432-8282.
Equipment Office and Attendants
(Racquet Court Bookings)
Tel. 432-8612.

STUDENT ASSOCIATION
Student Activity Centre
Building SE16 (4A), 3700 Willingdon Avenue, Burnaby, B.C. V5G 3H2
Tel: (604) 432-8600
Fax: (604) 434-3809

Student Government
Elections for the new executive are held in March each year. BCIT students are invited to run for the following positions: President, VP Public Relations & Marketing, VP Finance & Administration, VP Student Affairs, Engineering Chair, Business Chair, Trades Chair, Health Chair, Recreation & Athletic Chair, Members at Large.

Student Representation
Students are represented on the following Institute committees: Board of Governors, Alumni Association, Sexual Harassment, Anti-Discrimination, Health and Safety, Multiculturalism, Computer Resource, Education Council.

Major Programs
Campus Centre
The Campus Centre, a new Student Association building, will provide centrally located study, meeting and retail space. The building has been a dream of students since 1979 and will become the heart of BCIT.

Recycling
The campus wide recycling program operated by the Student Association is a demonstration of their commitment to the environment. The program recovers and markets valuable resources from the waste stream, reduces traditional disposal requirements and is developing a model waste management system for BCIT. Tel: 432-8288.

Childcare
The Student Association is a partner in the model childcare facility on campus. The Centre provides a language-based program which encourages 3-5 year old children to express themselves creatively through a variety of learning circles and learning centres as well as positive social interaction. Tel: 432-8919.

Car Pooling
Car pooling at BCIT has become the most popular event around. Hundreds of student carpoolers compete each September and January for a spot in the "Priority Parking" lot specifically reserved for carpoolers.

The Link
The Link, BCIT's campus newspaper, publishes every two weeks with a new issue full of interviews, on- and off-campus activities, sports, movies, theatre, music, social issues. The Student Orientation Guide is also produced by The Link. Tel: 432-8935.

Winterfest/Student Assistance Fund
Winterfest is a major fundraising event held by the Student Association in February, to raise money for the Student Assistance Fund. This fund allocates the monies raised to students showing a need for money not provided by student loans or other educational loans. All money raised is matched by a government grant up to a total of $7,000.

Support Programs
The Student Association channels revenues generated by its operations into programs and services for students. This department has developed four programs in the four years it has been in existence: Tutoring, Recycling, Childcare and a Safety Program. Tel: 432-8549.

Open House
BCIT's Open House provides an opportunity for students from each program to showcase their particular talents through unique and innovative displays. Sporting and entertainment activities are also a part of this exciting event which attracts over 50,000 visitors.

Recreation
This department promotes the concept of physical well-being and aims to encourage and maintain interest in physical and non-physical recreation. As an integral part of staff and student life on campus, the department attempts to provide activities so all members are able to participate in any of the four programs offered: intramurals; intercollegiate athletics; recreation instructional courses and special events; general recreation.

Shinerama
Shinerama is a nation-wide charity event held primarily in the month of September by post-secondary institutes all across Canada to raise funds for Cystic Fibrosis Research. Co-ordinated by the C.F. Foundation, the BCIT Student Association is a proud supporter of this worthy cause.

Copy Centre
The Student Association Copy Centre offers: full cerlox binding service, fax service, laminating, recycled paper, coloured and high grade bond papers, student identification and self service copiers located throughout the campus. Tel: 432-8757.

Lease/Management Operations
Several services at BCIT are available through lease and management agreements: Scholastic Insurance, Campus Travel Agency, Dukes' Cappuccino & Cookie Bar, White Spot's Legendary Grill, The Brown Bag Restaurant, Bytes Restaurant, Taps Student Pub.

Desktop Publishing
The Desktop Publishing Centre offers word processing for professional looking resumes, reports, term papers, and Desktop Publishing for any kind of poster or graphic. We offer high quality laser printing and rent self-serve MacIntosh and IBM computer stations with WordPerfect , PageMaker, Illustrator, FreeHand and MS Word. Tel: 432-8368.

This 'N That
With various locations on campus the "TNT" stores carry a wide range of products. From necessary stationery supplies, drafting supplies and calculators to exclusive BCIT imprinted clothing (infant to adult), and assorted gift ideas complete with cards and wrap. Whether snack food, stamps or service are your needs, we'll be happy to assist you. Tel: 435-5131.

The BCIT Student Association Operates, Lease or Supports:
- Shinerama (Cystic Fibrosis Research)
- Campus Travel (SE16)
- Campus Centre
- Environment Week
- Safety Program (NE1)
- Tutoring (NE1)
- Car Pooling
- Orientation Handbook
- Video Arcades
- Open House
- Taps Pub (SE16)
- Bytes Restaurant
- Dukes Cappuccino (SE16)
- This 'n That Stores (NE1, SW1, SE12)
- Winter Fest (Student Assist. Fund)
- Recreation (SE16)
- Brown Bag Rest. (NE30)
- Recycling (NE1)
- Childcare (SW7)
- Mentoring (NE1)
- Leadership Program (NE1)
- The Link (SE16)
- White Spot (SE16)
- Vending Operations
- Copy Centre (SE14)
- Desktop Publishing (SE14)
- Scholastic Insurance (SE16)

BANKING
The Canadian Imperial Bank of Commerce provides an Instant Teller Machine with Interac Network, at the entrance to Building SW1.

LOST AND FOUND
Please refer enquiries to Safety and Security at 432-8878. The Lost and Found is located in Building SW1, 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.

ALUMNI ASSOCIATION
1993/94 Alumni Association Executive

President: Guy Steeves
(Marketing Management '89)
Vice President: Bill MacPherson
(Business Administration '88 and Mechanical Systems '91)
Secretary: Jamie Mason
(Computer Systems '88)
Treasurer: Peter Broerken
(Financial Management '86)

The BCIT Alumni Association provides a vital communication link between graduates and the Institute. Graduates receive the Alumni Ambassador, published three times a year. The Association assists with organizing reunions and offers a group insurance policy.

The Association's membership includes all Technology/Trades/Vocational graduates who have completed programs of at least 6 months' duration, holders of Part-Time Studies Certificates as well as graduates of two-year Diploma of Technology programs. Membership is free of charge.

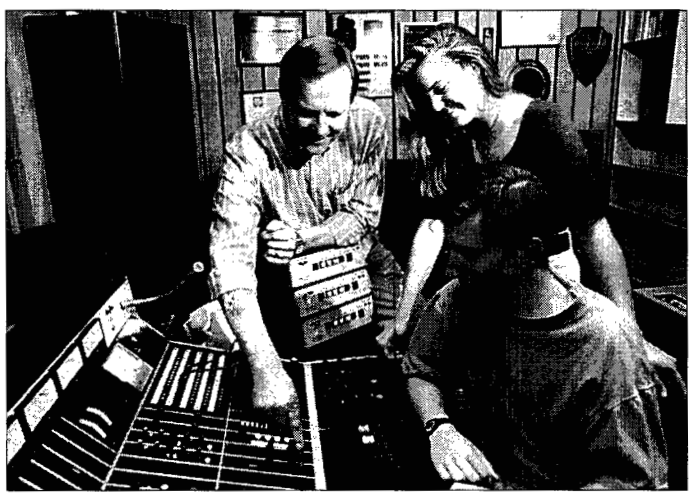
Membership in the Willingdon Club is available to all BCIT graduates. A three year membership costs $30 and entitles you to a variety of benefits including: library borrowing privileges, student rates for racquetball and squash courts on campus. Graduates, or about to be graduates may purchase Willingdon Club memberships in the Alumni office.

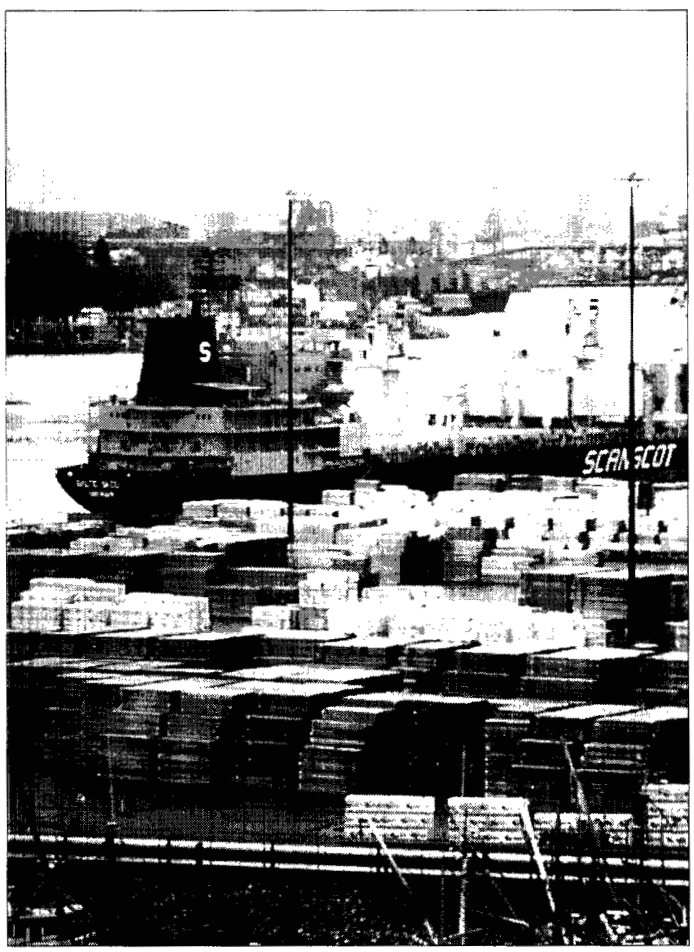
Priorities for the Alumni Association include involvement in the Campus Centre Campaign and the Alumni Fundraising Campaign for Student Scholarships and Awards; the presentation of eleven Alumni Entrance Awards to first year full-time students; promoting professional recognition for BCIT graduates and maintaining current alumni address records.

The Alumni Office is located in the Administration Building (NW1).
Tel. (604) 432-8847, Fax (604) 431-8911.


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SCAN SCOT

SCHOOL OF BUSINESS

44/ ADMINISTRATION
Office of the Dean
Administrative Management
Broadcast Communications
Financial Management
Marketing Management
Operations Management

44/ ADMINISTRATIVE STUDIES DEGREE COMPLETION PROGRAM

45/ BROADCAST COMMUNICATIONS
Radio
Television
Broadcast Journalism

50/ BUSINESS ADMINISTRATION

51/ FINANCIAL MANAGEMENT
Professional Accounting
Advanced Accounting
Taxation
Microfinancial Systems
Finance
Investment Management

55/ HUMAN RESOURCE MANAGEMENT

57/ HUMAN RESOURCE SYSTEMS

60/ INTERNATIONAL TRADE

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SCHOOL OF BUSINESS

ADMINISTRATION

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Bachelor of Administrative Studies
Human Resource Management
Post-diploma Program
Human Resource Systems
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Professional Sales
Small Business Development

Operations Management
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International Trade
Operations Management
Senior Certificate for Trades
Transportation Logistics

ADMINISTRATIVE STUDIES

Degree Completion Program

The Open Learning Agency, through its Open University, grants most BCIT Business Diploma graduates in Management Systems, Financial Management, Marketing Management, Operations Management, Human Resource Systems, International Trade, Transportation and Logistics, block transfer of up to 72 credits towards a Bachelor of Administrative Studies degree. BCIT graduates need at least 48 additional credits at BCIT and other institutions to meet the Open University requirement of 120 credits for a degree. For additional information on requirements for credit transfer for these and other diploma programs contact Student Services at 434-3304.

BCIT Business Diploma:

up to	72 credits
Open University & BCIT courses:	
at least	48 credits
Bachelor of Administrative Studies	120 credits

The 48 credits required may be earned through arts and science elective courses approved by the Open University and taken through the OLA or accredited universities and colleges, and advanced business courses taken at BCIT selected from the following list:

BUSA	5200	Business and Society
BUSA	6800	Strategic Management
ECON	5200	Intermediate Macroeconomic Analysis
ECON	6500	Managerial Economics
OPMT	5740	Integrated Management Information Systems
OPMT	5751	Mathematical Models in Business
ORGB	5600	Management of Change
OPMT	5701	Calculus

BCIT Admission and Registration Procedures for the Bachelor of Administrative Studies Degree offered in collaboration with the Open Learning Agency.
These procedures apply to BCIT Business Diploma graduates who wish to embark on the Open Learning Agency's Administrative Studies Degree Completion Program, granted by the OLA's Open University. Please refer to the Open Learning Agency for their admission procedures as they are an integral part of your admission and registration into this program. OLA admission information can be obtained from BCIT Student Services at 434-3304 or from Educational Access Services at OLA at 431-3300.

1. You must first establish your Program Plan with the Open Learning Agency
The OLA is responsible for reviewing your academic record from BCIT and any other post-secondary institution you have attended, to determine the amount of credit you will be awarded towards your degree. This critical first step tells you what courses you require to earn your degree.

2. Apply to BCIT
To apply, submit a full-time Application for Admission together with a copy of your Open Learning Agency approved program plan as soon as possible. You must state your intent to complete the program on a Full-time or Part-time Studies basis on your application. You are not required to submit transcripts from other post-secondary institutions with your application. Admission is based on the following:

a. academic performance in your BCIT Diploma program

b. a 500-word statement indicating your reasons for choosing the program

c. evidence of computer fluency since graduation, eg: familiarity with microcomputers and software.

You will receive confirmation from BCIT by letter that your Admission has been approved.

3. Course Registration
Once your admission has been confirmed, you can register for Advanced Studies in Business Degree Completion courses offered at the BCIT Burnaby campus. Check the current Part-time Studies flyer to determine which courses are available. Courses are normally offered in the Fall, Winter and Spring/Summer Terms.

The required credits may be earned through arts and sciences elective courses taken through the Open Learning Agency or through other accredited universities and colleges with a letter of permission from OLA. The Advanced Business courses are offered at BCIT. Additional courses can usually be taken at BCIT to meet the requirements established in your Program Plan.

Advanced Business courses include:

BUSA	5200	Business and Society
BUSA	6800	Strategic Management
ECON	5200	Intermediate Macroeconomic Analysis
ECON	6500	Managerial Economics
OPMT	5740	Integrated Management Information Systems
OPMT	5751	Mathematical Models for Business
ORGB	5600	Management of Change
OPMT	5701	Calculus

BROADCAST COMMUNICATIONS

Diploma Program

The Broadcast Communications programs were initiated through the combined efforts of the British Columbia Association of Broadcasters and the Canadian Broadcasting Corporation in this province. The need for trained personnel continues in radio and television operations, broadcast journalism, and related areas. Those interested in entering fields other than mass communications through broadcasting, audio and video production, public relations, cablecasting, etc., will find much of the basic background included in these programs.

The educational emphasis is upon versatility so that a graduate may find employment in a variety of occupations within broadcasting and associated industries. Students will enroll in one of three programs: Radio, Television or Broadcast Journalism.

Employment Opportunities

Graduates are employed throughout British Columbia and in all parts of the world, wherever radio, television, cable facilities, audio and video production operations exist. Entry level jobs for our graduates include disc jockeys, news reporters, commercial copy writers, production assistants, sales-marketing-promotion, video tape editors and ENG & EFP camera operators.

RADIO

This program provides detailed training in AM and FM radio operations. Extensive instruction is given in announcing, on-air operations, interviewing, commercial copywriting and production, feature and program production, as well as other operational areas including sales, management and news. Students also receive a great deal of practical experience via structured simulations in first year and operation of the campus radio station CFML cable 104.5 in second year. *Radio is currently under curriculum review.

TELEVISION

This program provides training in all aspects of video and television production. Students are exposed to a broad range of experience in commercials, public affairs, variety and studio program production, music videos, dramas, corporate and industrial videos, single-camera and studio techniques, news video, editing and post-production, lighting, writing, etc., so they may work in a variety of positions in television, video production houses, corporate and industrial production and cable television operations, and the freelance world.

*Television is currently under curriculum review.

BROADCAST JOURNALISM

This program prepares students for careers as news reporters, newscasters and editors in radio and television. Training includes basic news broadcasting skills and academic courses. News writing, audio and video editing, research, reporting and announcing are combined with a substantial background in politics, economics and other necessary topics. Regular newsroom and field reporting operations develop students' experience in news judgment, reporting and presentation. Students must have a valid drivers licence and access to a motor vehicle in Levels 2 through 4.

General Information

Applicants must pass appropriate audition and general knowledge/English tests, and must be able to type 25 correct words per minute to qualify for entrance into Broadcast Communications Programs. Normally, only qualified applicants will be interviewed.

In each of the programs, students are graded against industry and professional standards and must achieve such standards within their period of study in order to graduate.

Program Length

Two years full-time beginning in September each year.

Total Fees (subject to change—does not include book or supply costs)

$3,965.30 for the two-year program (1993/94).

Prerequisites

High School graduation with English 12 and proof of typing speed of 25 wpm is a general prerequisite. Applicants should apply early and ensure that their application is complete with all documentation in order to be considered.

All applicants must include in their applications a short essay (approximately 500 words) detailing their reasons for choosing broadcasting as a career and their career goals and aspirations. This essay must accompany the application, together with all pertinent documents, letters of reference, recommendations, school and university/college transcripts, etc. Include details on related experience.

Information meetings are held on the last Monday of August and the first Monday of each month during the school year (September to June) at 1730 in the Broadcast Centre, Building SE10. (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 Associate Dean and an interview in the field may be arranged.

All applications may be enhanced by enrolling in night school courses, volunteering at cable operations, university and community radio stations, etc.

The prospective applicant is expected to have a thorough knowledge of English. Previous studies in the areas of political science, history, psychology, business, law, computer science, and other humanities, as well as an up-to-date awareness of current events will prove valuable.

***The radio and television programs are currently under curriculum review. There may be some adjustments to courses described below.**

Program: RADIO

Level 1		
BCST	1100	Industry Organization
BCST	1101	Technical Introduction
BCST	1103	Copywriting 1
BCST	1110	Radio Programming and Operations 1
BCST	1111	Radio Announcing 1
BCST	1112	Contemporary Issues 1
BCST	1113	Introduction to Radio News 1
BUSA	1200	Business Concepts
COMM	1112	Communication for Broadcasters
Level 2		
BCST	2203	Copywriting 2
BCST	2209	Practicum 1
BCST	2210	Radio Programming and Operations 2
BCST	2211	Radio Announcing 2
BCST	2212	Contemporary Issues 2
BCST	2213	Introduction to Radio News 2
BCST	2214	Music and Programming
BLAW	3300	Broadcast Law
COMM	2212	Communication for Broadcasters
Level 3		
BCST	3303	Copywriting 3
BCST	3310	Radio Programming and Operations 3
BCST	3312	Marketing, Sales and Promotion
BCST	3315	Feature Program Production 1
BCST	3316	Audio Production
OPMT	1319	Statistics for Broadcasters
ORGB	2510	Interpersonal Relationships
Level 4		
BCST	4403	Copywriting 4
BCST	4409	Practicum 2
BCST	4410	Radio Programming and Operations 4
BCST	4415	Feature Program Production 2

Program: TELEVISION

Level 1

BCST	1100	Industry Organization
BCST	1101	Technical Introduction
BCST	1103	Copywriting 1
BCST	1120	Television Introduction 1
BCST	1223	Television Production Planning
COMM	1112	Communication for Broadcasters 1
ECON	1150	Economic Issues
ORGB	2510	Interpersonal Relationships

Level 2

BCST	1221	Visual Fundamentals for Television
BCST	2203	Copywriting 2
BCST	2209	Practicum 1
BCST	2220	Television Introduction 2
BCST	2222	Theory of Color Television Systems
BLAW	3300	Broadcast Law
COMM	2212	Communication for Broadcasters 2

Level 3

BCST	3320	Television Production 1
BCST	3322	Television News
BCST	3325	ENG Production 1
COMM	3312	Advanced Communication for Broadcasters
COMP	1107	Computers in Broadcasting

Level 4

BCST	4409	Practicum 2
BCST	4420	Television Production 2
BCST	4425	ENG Production 2
COMM	4412	Business Communication for Broadcasters

Program: BROADCAST JOURNALISM

Level 1

BCST	1100	Industry Organization
BCST	1130	Introduction to News Reporting
BCST	1131	Introduction to Announcing
BCST	1132	Introduction to Radio
BCST	1134	News Writing
BCST	1135	Municipal Government
BCST	1137	Visual Fundamentals for Journalists
COMM	1112	Communication for Broadcasters 1
ECON	1150	Economic Issues

Level 2

BCST	1331	Media Law
BCST	2209	Practicum 1
BCST	2230	News Reporting
BCST	2231	Announcing for Journalists
BCST	2232	Radio News 2
BCST	2233	Television News 2
COMM	2212	Communication for Broadcasters 2
COMP	1107	Computers in Broadcasting

Level 3

BCST	1431	Labour and Business
BCST	3332	Radio News 3
BCST	3333	Television News 3

Level 4

BCST	1235	Government and Politics
BCST	3336	Advanced News Writing
BCST	4409	Practicum 2
BCST	4430	Investigative Reporting
BCST	4432	Radio News 4
BCST	4433	Television News 4

Alterations in course offerings and hours may occur because of adaptation to changing industry conditions and demands. Some classes and practica operate around-the-clock and on weekends to emulate industry situations.

Course Descriptions

BCST 1100 (BCST 100) Industry Operations—This course provides a fundamental understanding of the operation of the broadcast industry, its foundations in the Broadcast Act, regulatory agencies, rules and regulations, audience measurement, music licensing, educational broadcasting, broadcast standards, associations and unions.

BCST 1101 (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 1103 (BCST 103) Copywriting 1—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 broadcasting are related. Commercials are studied in detail. Special emphasis is placed on developing the student's ability to work in groups. While students may not become writers, the course could lead to a position in copywriting, broadcast sales or promotion.

BCST 1110 (BCST 110) Radio Programming and Operations 1—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, recording units and broadcast accessories, and develops the manual dexterity needed to operate this equipment.

BCST 1111 (BCST 111) Radio Announcing 1—An introduction to effective oral communication for radio using lectures, exercises and practical application of the techniques of various specialized forms. Individual and classroom critiques are employed; auditions and assignments measure progress. Broadcast regulations and program scheduling are also included in the announcer-related areas of practical responsibilities.

BCST 1112 (BCST 112) Contemporary Issues 1—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 1113 (BCST 113) Introduction to Radio News 1—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 information and will make them more aware of the importance of information programming in the broadcast industry.

BCST 1120 (BCST 120) Television Introduction 1—Students will 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 a combination of lectures and practical exercises.

BCST 1130 (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 students a grounding in the systems, issues, and policies of the broadcast news industry and will prepare them for the more detailed and involved aspects of the succeeding news course.

BCST 1131 (BCST 131) Introduction to Announcing—The student is introduced to basic concepts of voice usage, announcing techniques and news reading skills. Stress is placed on daily practice and students receive both individual and group coaching.

BCST 1132 (BCST 132) Introduction to Radio—Broadcast Journalism students are

introduced to radio broadcasting equipment and production techniques. The course is designed to give the student a basic understanding of the operational side of radio broadcasting. Practical work complements classroom instruction.

BCST 1134 (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.

BCST 1135 (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.

BCST 1137 (BCST 137) Visual Fundamentals for Journalists—Students examine the language of pictures and their use to convey information. Topics include the history of pictorial communication, social context, the relationship between picture making technologies, picture communication 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 1221 (BCST 221) Visual Fundamentals for Television—Designed for TV students, the course concentrates on visual techniques that will form the basis for shooting in studio and in the field.

BCST 1223 (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 program.

BCST 1235 (BCST 235) Government and Politics—Since a broadcast journalist frequently deals with political issues, this course acquaints the student with the structure of the Canadian Federal and Provincial governments. It also provides an opportunity to research political issues and interact with other students on current issues.

BCST 1331 (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 familiarizes students with Canadian criminal law and the laws of libel and slander.

BCST 1431 (BCST 431) Labour and Business—As students approach graduation, it is important that they have a good understanding of labour unions and the management structure. This course explains the structure of unions as well as the labour laws of B.C. and Canada. The second part of the course explores the complexities of business, finance and the stock market.

BCST 2203 (BCST 203) Copywriting 2—See BCST 1103. Prerequisite: BCST 1103.

BCST 2209 (BCST 209) Practicum 1—This is a four-week practical exercise to complete first year. Radio students operate campus radio station CFML, twenty-four hours per day, during this period. Television students produce a series of program segments and apply Electronic News Gathering techniques. Broadcast Journalism students work both with Radio students in providing news coverage on CFML and with Television students in covering television news stories.

BCST 2210 (BCST 210) Radio Programming and Operations 2—A continuation of BCST 1110, the major emphasis is 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 1100.

BCST 2211 (BCST 211) Radio Announcing 2—Effective oral communication of ad-lib and written material is strengthened, 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 1111.

BCST 2212 (BCST 212) Contemporary Issues 2—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 is stressed. Prerequisite: BCST 1112.

BCST 2213 (BCST 213) Introduction to Radio News 2—Introduces current regional, national and international issues appearing in the news media. Discussions focus on issues behind the issues, origins of issues, handling news, writing style, line-ups, etc. Prerequisite: BCST 1113.

BCST 2214 (BCST 214) Music and Programming—The music portion of this course focuses on the development and promotion of artists and their music and the relationship of the music industry to the broadcast industry. The programming portion examines radio station formats and their implementation. Prerequisite: BCST 1110.

BCST 2220 (BCST 220) Television Introduction 2—See BCST 1120. Prerequisite: BCST 1120.

BCST 2222 (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 1101.

BCST 2230 (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 labour, business, and politics. Prerequisite: BCST 1130.

BCST 2231 (BCST 231) Announcing for Journalists—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 in ad-lib techniques and interviewing. The student must develop proficiency in news presentation for both radio and TV. News writing also plays a major role in this course. Prerequisite: BCST 1131.

BCST 2232 (BCST 232) Radio News 2—This is the first opportunity for students to work in a newsroom environment, on or off campus. The class is divided into small groups for personal instruction on operating newsroom equipment. This is followed by several weeks of practice where students gather, write, compile and read newscasts as well as hone their ability to use newsroom equipment. Prerequisite: BCST 1134, 1130.

BCST 2233 (BCST 233) Television News 2—Students learn the process by which a story idea is transformed into a television news story, how 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 1130.

BCST 3303 (BCST 303) Copywriting 3—This is a lab course in which the instructor

works with the students on the preparation of commercial and public service advertising campaigns. Commercials written by the students are then produced and aired on CFML. Prerequisite: BCST 2203.

BCST 3310 (BCST 310) Radio Programming and Operations 3—Having gained basic competence in radio broadcasting techniques, students now apply their knowledge to regular practical work through daily operation of the campus radio station CFML, available on cable FM throughout the lower mainland. All work must be done to industry standards and individual and group performance is evaluated and critiqued. In lectures, students receive training in station systems and operations. In practice, students perform all the roles normally found in industry. The course is demanding and stimulating. Prerequisite: BCST 1110, 2210, 1111, 2211.

BCST 3312 (BCST 312) Radio Marketing, Sales and Promotion—Detailed studies cover a number of topics that develop student broadcasters' attitudes toward the industry and their abilities to perform within it. Major emphasis is placed on broadcast sales and promotion. Prerequisite: BCST 1110, 1111, 2210, 2211.

BCST 3315 (BCST 315) Feature Program Production 1—This is an assignment-oriented course which focuses on the production of CFML's half-hour documentaries. Research, writing and production skills are applied throughout the course. Prerequisite: BCST 2210.

BCST 3316 (BCST 316) Audio Production—This is an assignment-oriented course which looks at the many facets of audio production including multi-track recording, commercial production, documentary production, audiovisual production and music recording and production. Prerequisite: BCST 2210.

BCST 3320 (BCST 320) Television Production 1—Upon successful completion of this course, students will be able to demonstrate their professional competency as members of a television or video 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 1120, 2220.

BCST 3322 (BCST 322) Television News—Students learn more sophisticated visual techniques which are put to use in the daily preparation of Electronic News Gathering stories. Lectures are interspersed with weekly newscasts throughout the term. Prerequisite: BCST 2221.

BCST 3325 (BCST 325) ENG Production 1—This course is designed to further acquaint television students with the electronic news gathering skills learned in first year TV Practicum. Students will gain a wide range of experience both as camera persons and news editors. News stories will be produced in conjunction with TV reporters. Professionalism and the ability to work as a team are essential for success in this course.

BCST 3332 (BCST 332) Radio News 3—Students now begin 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 performance critiques. Prerequisite: BCST 2232.

BCST 3333 (BCST 333) Television News 3—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 studio and graphic facilities. Stories are incorporated into news programs that are produced in conjunction with the Television program. Prerequisite: BCST 2233.

BCST 3336 (BCST 336) Advanced News Writing—Teaches students to develop and write stories incorporating the creative and factual aspects of news. Students learn how to look for story elements which hold the interest of an audience, and to relate those elements with maximum clarity and impact.

BCST 4403 (BCST 403) Copywriting 4—This is a continuation of the work started in BCST 3303. Prerequisite: BCST 2203.

BCST 4409 (BCST 409) Practicum 2—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 final preparation for assuming paid positions as a start to broadcast careers. Prerequisite: Successful completion of ALL Level 1, 2, 3 and 4A courses.

BCST 4410 (BCST 410) Radio Programming and Operations 4—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 cooperative 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 1110, 2210, 3310.

BCST 4415 (BCST 415) Feature Program Production 2—See BCST 3315. Prerequisite: BCST 3315.

BCST 4420 (BCST 420) Television Production 2—See BCST 3320. Prerequisite: BCST 3320.

BCST 4425 (BCST 425) ENG Production 2—This course fine-tunes the electronic news gathering skills gained in BCST 3323.

BCST 4430 (BCST 430) Investigative Reporting—Even though all reporting involves the investigative process, this course prepares the student for specialized reporting on public affairs and consumer research. The student is taught specific research and interviewing techniques and is expected to complete a major investigative project. Prerequisite: BCST 2235.

BCST 4432 (BCST 432) Radio News 4—This is the advanced course in newsroom operations. Students continue to practice the skills of reporting, writing and announcing, and 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 students in strengthening their performance for entry into the industry. Prerequisite: BCST 3332.

BCST 4433 (BCST 433) Television News 4—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 3333.

BLAW 3300 (ADMN 381) Broadcast Law—This introduction to the Canadian legal system emphasizes contracts, torts (including defamation and privacy), criminal law, court procedure and contempt, secured transactions, government agencies, employment law, forms of doing business, negotiable instruments, and other topics applicable to broadcast business.

BUSA 1200 (ADMN 115) Business Concepts—This course is designed to expose students to some of the general workings of the economy and business. This will enable them to relate these topics to listenership when reading news or presenting general ad-lib material.

COMM 1112 (BCOM 101) Communication for Broadcasters 1—Through lectures, labs and industry

examples, this course examines some of the basic differences between writing for print and writing for the ear and eye. 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.

COMM 2212 (BCOM 201) Communication for Broadcasters 2—A continuation of COMM 1112, this segment of the course will apply the principles of radio and television writing. Students will work individually and in groups to produce a number of presentations and scripts including a documentary feature. Prerequisite: COMM 1112.

COMM 3312 (BCOM 301) Advanced 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 effective reading, time management and advanced research techniques. Prerequisite: COMM 2212.

COMM 4412 (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. Prerequisite: COMM 1112, 2212, 3312.

COMP 1107 (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 areas of broadcasting including computer graphics and word processing.

ECON 1150 (ADMN 101) Economic Issues—Exposes students to the application of various economic principles to the study of particular problems. Broadcast Communications students receive customized course material designed to make them aware of a variety of economic issues that relate to broadcasting operations and practices.

OPMT 1319 (OPMT 319) Statistics for Broadcasters—A customized statistics course, designed to introduce broadcasting students to the world of collecting, summarizing and treating data to facilitate its use and comprehension. Forecasting techniques are discussed, along with measurement procedures employed in opinion polling and broadcast ratings systems.

ORGB 2510 (ADMN 320) Interpersonal Relationships—Broadcasting involves unusually close interaction among its participants who work together to provide information, entertainment and revenues. The course explores the importance of harmonious relationships and methods for achieving them.

Faculty and Staff

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Y. Eamor, Program Head, Broadcast Journalism
T. Handel, Dipl. T., Dipl. Adult Ed., Television
J.R. Jonasson
J.J. Kemp
A. Klein
R. Leipert
K.J. Mitchell (on leave)
R.H.B. Nason, B.A., M.P.S.
B. O'Neill, Chief Engineer
G. Orr, Dipl.T.
M.K. Purkis, Dipl.T.
K. Ribble
R. Riskin, Dipl. T., Program Head, Television
R. Taylor

Advisory Committee: Radio

John Ansell, Rogers Communications
Dale Buote, Program Director, CKKS—FM Radio
Jan Evanski, Creative Director, CKNW Radio
Nick Frost, President & General Manager SILK Broadcasting Ltd.
Jim Johnston, Program Director, CFMI FM Radio
Ken Kilcullen, Program Directo CKPG, Radio
Gary Milne, Marketing Manager, Radio Station CKWX, Radio
Erin Petrie, General Manager, S.R.N.
Peter Schell, Manager, Technical Services, CBC Radio
Wayne Stafford, General Sales Manager, Radio Station CFUN, Radio, Chair
Shirley Stocker, Radio Station CKNW'98

Advisory Committee: Television

Rick Beal, Assistant Manager of TV Technical Services, CBC B.C.
Oliver Eichel, Operations Manager, Post Haste Video
Andy Jerzebiak, Technical Supervisor, BCTV
Dale Johannesen, Director of Photography, Shooters Production Services
Ron Petrescue, Head of Production Services, CBC B.C.
Karen Pinnell, Commercial Production Manager, BCTV
Mike Potter, Manager, Operations, Knowledge Network
Dave Sherwood, Creative Director, CKPG TV
Dave Stewart, Assistant Manager, Master Control, CKVU TV
John Thomas, VP & General Manager, Delta Cable
Don Thompson, General Manager, Finale Post Production Inc.
Martin Traux, Program Director, Vancouver Rogers Cable 4
Rob Weller, Production Manager, CHBC TV
Chris Wilson, Creative Services Specialist, BC Tel, Chair

Advisory Committee: Broadcast Journalism

Mike Bothwell, CKVU
Richard Dettman, News Director, CFVR Radio, Chair
Liz Hughes, Executive Producer, CBC Radio Current Affairs
Karl Johnston, News Director, CJCI Radio
Tony Parsons, BCTV
Gordon Vizzutti, News Director, CHBC Television
Wayne Williams, Reporter, CBC TV
Mike Woodworth, News Director, CKPG Radio—TV
Steve Wyatt, Managing Editor, U News

BUSINESS ADMINISTRATION

Post-Diploma Program

This nine-month, post-diploma program is designed for students with college or university graduation or a diploma of technology in health or engineering. Preferably following some experience in the work force, graduates of other programs may wish to assume supervisory and managerial responsibilities and benefit from further training in business management to be effective administrators. All students are required to carry a full course load each term.

The Program

This program includes such basic business subjects as management accounting, economics, marketing, law, human resource management, labour relations and business systems computer 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.

Program Length

Nine months full-time beginning in September each year.

Total Fees (subject to change—does not include book or supply costs)

$1,991.15 for the 9-month program (1993/94).

Prerequisites

College or University graduation or 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

Degree transfer opportunities are possible on completion of the diploma.

Graduates may earn advanced credit towards designation as a Chartered Accountant, a Certified General Accountant, or a Certified Management Accountant.

Level 1

BUSA	3510	Management Science
BUSA	3700	Microcomputer Software Systems
COMM	2210	Advanced Communication for Business Administration
ECON	2100	Microeconomics
FMGT	5110	Financial Management 1
OPMT	1510	Business Mathematics
ORGB	2100	Organizational Behavior

Level 2

BLAW	3100	Business Law
BUSA	4610	Microcomputer Software Applications
BUSA	4810	Management Policy
COMP	2180	Computers and Information Systems
ECON	2200	Macroeconomics
FMGT	6110	Financial Management 2
HRMG	3010	Human Resource/Industrial Relations Management
MKTG	1113	Introduction to Marketing

Course Descriptions

BLAW 3100 (ADMN 385) Business Law—This is a one-term, condensed course designed to provide the business student with a basic knowledge of Canadian law including the legal system, torts, contracts, sale of goods and consumer protection, secured transactions and creditors' protection, employment, agency, business organizations, negotiable instruments, real estate and administrative law. The long-term aim of this course may best be described as the inculcation of a sensitivity to and recognition of the legal aspects of doing business, with a decided emphasis on prevention of legal difficulties, i.e. to know when to call a lawyer.

BUSA 3510 (ADMN 511) Management Science—Emphasizes the use of decision-making models in business. Trains students in the use of quantitative methods in the choice of alternatives in the decision-making process. Microcomputers will be used to solve problems.

BUSA 3700 (ADMN 361) Microcomputer Software Systems—An introduction to the use of applications software on the microcomputer. Topics currently focus on business graphics and spreadsheets, using one or more operating systems.

BUSA 4610 (ADMN 461) Microcomputer Software Applications—A continuation of BUSA 3700, with emphasis on the solution of practical problems. Students will become familiar with database and other programs on the IBM-PC system enabling them to use them in other course areas. Prerequisite: BUSA 3700.

BUSA 4810 (ADMN 611) 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.

COMM 2210 (BCOM 302) Advanced Communication for Business Administration—As future managers, students learn to retrieve, extract and report information efficiently. Building on skills acquired in previous communication courses, this course emphasizes persuasive writing and speaking skills, especially proposal writing.

COMP 2180 (COMP 213) Computers and Information Systems—Basic data processing principles; flow-charting, analyzing 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. Course content is linked to topics developed in BUSA 3700 and BUSA 4610.

ECON 2100 (ADMN 100) Microeconomics—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.

ECON 2200 (ADMN 200) Macroeconomics—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.

FMGT 5110 (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 6110 (FMGT 619) Financial Management 2—See FMGT 5110. Prerequisite: FMGT 5110.

HRMG 3010 (ADMN 342) Human Resource/Industrial Relations Management—An introduction to the major personnel and industrial relations programs applicable to the B.C. workplace with emphasis on the value of the worker and the overall effectiveness of modern human resource management. The course develops an understanding of the skills required for selection interviews, performance appraisals, compensation reviews, labour contract negotiations, training and development programs, grievance and collective agreement administration. It also reviews relevant employment law.

MKTG 1113 (MKTG 113) Introduction to Marketing—An introduction to the marketing environment and marketing institutions. Detailed study of basic marketing functions, marketing research, product planning, selection of trade channels, merchandising, advertising, sales promotion and salesmanship. Embraces marketing of consumer and industrial goods.

OPMT 1510 (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.

ORGB 2100 (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 decision-making; and micro or individual factors such as attitudes, perception and motivation.

Faculty and Staff

M. Baxter, B.A.A., Dipl.T., CPHI (C)
C. Clark, B.A., M.A.
D. Davis, B.A., M.A., LL.B.
C.J. Dickhoff, B.A., M.A. (Econ)., M.A. (Public Admin.)
R.W. Hooker, B.A., B.Sc., M.A., LL.B., Senior Instructor
C.L.R. Jaques, B.A., M.A.
L.E. Johnson, B.B.A., M.B.A., Program Head
L. Jones, B.Sc., M.Sc.
T.P. Juzkow, B.A.Sc., M.B.A., P.Eng.
F. Mandl, B.Sc., M.B.A.
D. Pepper, B.A., M.Sc., Ph.D., Program Head
R.M. Sharp, B.A.Sc., M.B.A., P.Eng.
G. Storey, B.A., M.Sc., Program Head
N.E. Stromgren, C.D., B.A., M.Ed. (Admin.)
B. Van der Woerd, B.A.
F.C. Williams, B.A. (Hons.), M.A.
R.A. Yates, LL.B., M.B.A.

FINANCIAL MANAGEMENT

Diploma Program

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. The advent of microcomputers has meant increased sophistication in financial management techniques. In the first year, students will receive a good grounding in core business subjects. In second year, the program becomes increasingly specialized, and students will be required to select one of the six programs listed below.

Job Opportunities

The **Professional Accounting** program leads to middle management positions in financial accounting, cost accounting, internal audit and budget preparation. Graduates of this program will usually go on to obtain a professional designation as a C.G.A. or C.M.A.

A limited number of students will be accepted into the **Advanced Accounting** program. Most graduates of this program will find employment with professional accounting firms and will go on to obtain the C.A., C.G.A. or C.M.A. designation.

The **Taxation** program will be of interest to those who would like to work for government or in a professional accounting firm where added tax knowledge would be beneficial. Again, graduates will usually go on to obtain a professional accounting designation.

The **Microfinancial Systems** program will enable a select group of students to obtain greater expertise in the use of microcomputer hardware and software applications related to financial management. There is a big demand for graduates with knowledge both of accounting and of microcomputers.

The **Finance** program prepares a student for employment in the finance department of a small or intermediate sized business. As well, with the background obtained in this program, graduates have secured employment in the banking, brokerage, trust and insurance industries.

The **Investment Management** program prepares a student for employment in banking, international finance, brokerage firms and the finance departments of large companies.

Beginning Salaries

Successful graduates who complete additional training can expect, with significant varied experience, to achieve middle to senior management positions earning annual salaries in excess of $60,000. To achieve this level of success means starting in entry-level positions in financial accounting, cost accounting, internal audit, budget preparation, brokerage, banking, trust and insurance, with starting salaries as high as $2,550 per month.

The Programs

In the first year, all Financial Management students complete the same course of studies in core business subjects. Many of the second year courses are also common. Specialized courses in each of the six programs are:

- Professional Accounting—Auditing, Security Fundamentals and Projects in Industry;
- Advanced Accounting—Advanced Accounting and Auditing;
- Taxation—Selected Topics in Tax, Auditing and Security Fundamentals;
- Microfinancial Systems—Advanced Microcomputer Applications, Auditing and Security Fundamentals;
- Finance—Enterprise Finance, Security Analysis and Money and Banking;
- Investment Management—Investment Banking, Security Analysis and Money and Banking.

Program Length

Two years full-time beginning in September each year.

Total Fees (subject to change—does not include book or supply costs)

$3,965.30 for the two-year program (1993/94).

Direct Entry to Second Year

Applicants who already possess a university degree, associate of arts certificate or a diploma of technology, may be eligible for direct entry to the second year of any Financial Management program. Applicants who have completed the equivalent of the first-year program at BCIT may also be eligible for direct entry to second year. Please note that FMGT 2100 (or its equivalent) is a prerequisite for nearly all second-year courses. All applicants are encouraged to contact the department directly to clarify their opportunities.

Prerequisites

High school graduation with Math 11 and English 12 both with C+ are the minimum 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. Preference is given to applicants with an average of better than C+ in grade 12 courses and to applicants with at least two years of full-time work experience. Candidates who do not meet these requirements 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. A pre-admission interview may be conducted by members of the Financial Management Technology to assess applicants' suitability for the field, including written and oral communication skills.

Advanced Training/ Degree Transfer and Completion

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 in Financial Management will receive up to 72 credits toward the Bachelor of Administrative Studies degree from the Open Learning Agency through its Open University (120 credits are required for a degree).

Many of our graduates successfully achieve a university degree from Lakehead University (Ontario) with only 1 year of additional studies. A block credit arrangement is in effect with Simon Fraser University.

Accreditation

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, and our graduates are able to achieve a professional designation within two years, after receiving their BCIT Diploma.

In the Finance field, students who choose the Finance or Invesment management programs are permitted to write the Canadian Securities Course examination while they are still at BCIT. This examination is the first step for those who would like to become stockbrokers. In addition, it is widely regarded as a foundation course in investments by the financial community in general and is a prerequisite for all other courses and programs offered by the Canadian Securities Institute.

Technology: FINANCIAL MANAGEMENT

Level 1

BUSA	1100	Management
COMM	1100	Business Communication
COMP	1104	Introduction to Computing
ECON	2100	Microeconomics
FMGT	1100	Accounting 1
MKTG	1102	Essentials of Marketing
OPMT	1110	Business Mathematics

Level 2

COMM	2200	Business Communication 2
COMP	2125	Computers in Business
ECON	2200	Macroeconomics
FMGT	2100	Accounting 2
FMGT	2540	Working Capital Management
FMGT	2710	Computerized Accounting
FMGT	2910	Finance Reports
OPMT	1130	Business Statistics
ORGB	2100	Organizational Behavior

Program: PROFESSIONAL ACCOUNTING

Level 3

BLAW	3100	Business Law
FMGT	3110	Financial Accounting 1
FMGT	3210	Cost and Managerial Accounting 1
FMGT	3310	Auditing 1
FMGT	3410	Taxation 1
FMGT	3510	Finance 1
FMGT	3710	Microcomputer Systems 1

Level 4

FMGT	4110	Financial Accounting 2
FMGT	4210	Cost and Managerial Accounting 2
FMGT	4310	Auditing 2
FMGT	4410	Taxation 2
FMGT	4510	Finance 2
FMGT	4620	Security Fundamentals
FMGT	4710	Microcomputer Systems 2
FMGT	4910	Projects in Industry

Program: ADVANCED ACCOUNTING

Level 3

BLAW	3100	Business Law
FMGT	3110	Financial Accounting 1
FMGT	3210	Cost and Managerial Accounting 1
FMGT	3310	Auditing 1
FMGT	3410	Taxation 1
FMGT	3510	Finance 1
FMGT	3710	Microcomputer Systems 1

Level 4

FMGT	4110	Financial Accounting 2
FMGT	4120	Advanced Accounting
FMGT	4210	Cost and Managerial Accounting 2
FMGT	4310	Auditing 2
FMGT	4410	Taxation 2
FMGT	4510	Finance 2
FMGT	4710	Microcomputer Systems 2

Program: TAXATION

Level 3

BLAW	3100	Business Law
FMGT	3110	Financial Accounting 1
FMGT	3210	Cost and Managerial Accounting 1
FMGT	3310	Auditing 1
FMGT	3410	Taxation 1
FMGT	3510	Finance 1
FMGT	3710	Microcomputer Systems 1

Level 4

FMGT	4110	Financial Accounting 2
FMGT	4210	Cost and Managerial Accounting 2
FMGT	4310	Auditing 2
FMGT	4410	Taxation 2
FMGT	4430	Selected Topics in Tax
FMGT	4510	Finance 2
FMGT	4620	Security Fundamentals
FMGT	4710	Microcomputer Systems 2

Program: MICROFINANCIAL SYSTEMS

Level 3

BLAW	3100	Business Law
FMGT	3110	Financial Accounting 1
FMGT	3210	Cost and Managerial Accounting 1
FMGT	3310	Auditing 1
FMGT	3410	Taxation 1
FMGT	3510	Finance 1
FMGT	3720	Advanced Microcomputer Applications 1

Level 4

FMGT	4110	Financial Accounting 2
FMGT	4210	Cost and Managerial Accounting 2
FMGT	4310	Auditing 2
FMGT	4410	Taxation 2
FMGT	4510	Finance 2
FMGT	4620	Security Fundamentals
FMGT	4720	Advanced Microcomputer Applications 2
FMGT	4910	Projects in Industry

Program: FINANCE

Level 3

BLAW	3100	Business Law
FMGT	3110	Financial Accounting 1
FMGT	3210	Cost and Managerial Accounting 1
FMGT	3410	Taxation 1
FMGT	3510	Finance 1
FMGT	3610	Security Analysis 1
FMGT	3710	Microcomputer Systems 1

Level 4

FMGT	4110	Financial Accounting 2
FMGT	4210	Cost and Managerial Accounting 2
FMGT	4410	Taxation 2
FMGT	4510	Finance 2
FMGT	4520	Enterprise Finance
FMGT	4570	Money and Banking
FMGT	4610	Security Analysis 2
FMGT	4710	Microcomputer Systems 2

Program: INVESTMENT MANAGEMENT

Level 3

BLAW	3100	Business Law
FMGT	3110	Financial Accounting 1
FMGT	3210	Cost and Managerial Accounting 1
FMGT	3410	Taxation 1
FMGT	3510	Finance 1
FMGT	3610	Security Analysis 1
FMGT	3710	Microcomputer Systems 1

Level 4

FMGT	4110	Financial Accounting 2
FMGT	4210	Cost and Managerial Accounting 2
FMGT	4410	Taxation 2
FMGT	4510	Finance 2
FMGT	4530	Investment Banking
FMGT	4570	Money and Banking
FMGT	4710	Microcomputer Systems 2

Course Descriptions

BLAW 3100 (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.

BUSA 1100 (ADMN 102) Management—A study of the management functions of planning, organizing, staffing and controlling. Included are such topics as forms of business ownership, tactical and strategic planning, decision-making, structuring the organization, providing human resources and controlling operations. Students are given the opportunity to develop analytical and communication skills by analyzing and presenting solutions to typical business problems.

COMM 1100 (BCOM 100) Business Communication—Communicating on the job is a complex process which includes gathering and evaluating data, collaborating with co-workers, reporting to superiors, and presenting information and ideas. This introductory business communication course is designed to give students basic listening, writing, and speaking skills which will allow them to prepare written and oral reports for BCIT courses and to proceed to more advanced communication courses.

COMM 2200 (BCOM 200) Business Communication 2—This course gives further instruction and practice in the principles taught in COMM 1100. It 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 processing. Prerequisite: COMM 1100.

COMP 1104 (COMP 108) Introduction to Computing—Lectures and practical exercises are used to present topics on computer terminology, hardware, software, DOS (Disc Operating System), and a word processing package.

COMP 2125 (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 specific technologies. Prerequisite: COMP 1104.

ECON 2100 (ADMN 100) Microeconomics—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.

ECON 2200 (ADMN 200) Macroeconomics—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.

FMGT 1100 (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 2100. 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 2100 (FMGT 201) Accounting 2—The follow-up to FMGT 1100. Topics include notes and accounts receivable, long-lived assets, liabilities, partnerships and corporations, cash-flow, manufacturing accounting, management accounting, consolidated statements and analysis of financial statements. Prerequisite: FMGT 1100.

FMGT 2540 (FMGT 293) Working Capital Management—This course will enable students to understand the relationships between current assets and current liabilities in different types of organizations, to appreciate the trade-offs inherent in a firm's working capital policy, and to carry out a basic analysis of a firm's working capital management in comparison to others. Prerequisite: FMGT 1100.

FMGT 2710 (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 currently available in the marketplace. The emphasis of this course is to upgrade students' ability to handle modern accounting software packages on the microcomputer. Prerequisite: FMGT 1100.

FMGT 2910 (FMGT 291) Finance 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 audiovisual techniques and equipment. Prerequisite: FMGT 1100.

FMGT 3110 (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 4110 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 critical standpoint; the income statement and balance sheet; statement of changes in financial position (cash basis); cost, valuation, presentation and income measurement problems associated with current assets and current liabilities. Prerequisite: FMGT 2100.

FMGT 3210 (FMGT 301) Cost and Managerial Accounting 1—Emphasizes the role of the management accountant, cost concepts and terminology, CVP analysis, cost flows, job costing, budgeting and

control, standard costs and variances, and variable costing. Prerequisite: FMGT 2100.

FMGT 3310 (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 2100.

FMGT 3410 (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 4410 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 2100.

FMGT 3510 (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 favourable terms as possible. This course focuses on the following topics related to these overall aims: corporate organization and taxation, determining the cost of capital, allocation of funds through financial markets, valuation of financial instruments and financial statement analysis. Prerequisite: FMGT 2100.

FMGT 3610 (FMGT 308) Security Analysis 1—This is an introductory level course in investments. Topics include the nature of common shares and the markets in which they trade; the impact of fluctuations in the business cycle on security prices; the analysis of securities from a fundamental and technical perspective. Prerequisite: FMGT 2100.

FMGT 3710 (FMGT 318) Microcomputer Systems 1—Students will have the opportunity to develop expertise in the AccPac accounting software package. They will learn how to use a spreadsheet package for financial modelling and analysis. Prerequisite: COMP 2125.

FMGT 3720 (FMGT 323) Advanced Microcomputer Applications 1—The course will build upon a basic knowledge of DOS and spreadsheet packages with more sophisticated techniques and applications. Hard disk management, file recovery and transfer techniques will also be covered. Prerequisite: COMP 2125.

FMGT 4110 (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. Prerequisite: FMGT 3110.

FMGT 4120 (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. Consolidations will be examined for up to two subsidiaries. Accounting for foreign currency transactions will also be studied, along with fund accounting. Prerequisite: FMGT 3110.

FMGT 4210 (FMGT 401) Cost and Managerial Accounting 2—Emphasizes relevant costing for decision-making, cost behavior, cost allocation, joint and by-products, process costing, linear programming, and mix and yield variances. Prerequisite: FMGT 3210.

FMGT 4310 (FMGT 406) Auditing 2—Follow-up to FMGT 3310. 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 3310.

FMGT 4410 (FMGT 409) Taxation 2—Students expand on their study of Canadian income tax begun in FMGT 3410 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 and assessment (including returns, appeals, reassessment and payment). Prerequisite: FMGT 3410.

FMGT 4430 (FMGT 429) Selected Topics in Tax—This course will cover topics in taxation which are either not covered in Taxation 1 and 2 or not covered in depth, such as the Goods and Services Tax, corporate reorganizations, real estate taxation and other similar special topics.

FMGT 4510 (FMGT 404) Finance 2—This course continues where FMGT 3510 left off and focuses on: sources of short, medium and long-term financing; capital budgeting techniques (IRR and NPV), working capital management, dividend policy, 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 3510.

FMGT 4520 (FMGT 414) Enterprise 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 will include bank financing, government funding and venture capital. Prerequisite: FMGT 3510.

FMGT 4530 (FMGT 445) Investment Banking—Major topic areas are corporate evaluation, asset and liability management, financial intermediaries, and money market instruments. The focus of all four areas will be international as well as domestic investment banking. Prerequisite: FMGT 3510, 3610.

FMGT 4570 (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: ECON 2100, 2200.

FMGT 4610 (FMGT 405) Security Analysis 2—This course is an examination of financial assets exclusive of common shares. Topics include the nature, markets, and the valuation process of fixed income securities, convertible securities, warrants and options. As well, alternative forms of investments such as mutual funds will be discussed. Prerequisite: FMGT 3610.

FMGT 4620 (FMGT 412) Security Fundamentals—An introduction to the fundamentals of investing including market mechanics, the investment setting, technical and fundamental analysis of common stock, preferred stock and corporate bonds. Prerequisite: FMGT 2100.

FMGT 4710 (FMGT 407) Microcomputer Systems 2—A continuation of FMGT 3710 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 3710.

FMGT 4720 (FMGT 423) Advanced Microcomputer Applications 2—The course will include database techniques, communication and other specialty packages and system selection and installation. Prerequisite: FMGT 3720.

FMGT 4910 (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 Level 3.

MKTG 1102 (MKTG 102) Essentials of Marketing—An introductory course designed to provide the student with an overview of the marketing concept and how it can be applied to any type of organization or service. Material includes the controllable and uncontrollable elements of marketing, strategy planning, market characteristics, marketing research techniques, market segmentation and target market selection.

OPMT 1110 (OPMT 110) 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 preprogrammed calculator, and practical application from the field of financial management.

OPMT 1130 (OPMT 132) Business Statistics—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.

ORGB 2100 (ADMN 226) 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.

Faculty and Staff

G.H. Farrell, Dipl. T., M.B.A., F.C.M.A., Associate Dean
R.C. Bell, B.A. (Econ.), C.G.A.
C.M. Briscall, B.Com., M.B.A., F.C.M.A., Program Head
D.K. Chan, B.Comm., M.B.A., C.A.
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S.M. Hatten, Dipl.T., R.T., C.G.A.
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P.J. Woolley, B.A., M.A., F.C.A.
H.B. Yackness, B.Com., M.B.A., C.A., Program Head

Advisory Committee Members

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S. King, Deloitte & Touche, Vice-Chairperson
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P. Bower, The Certified General Accountants Association of British Columbia
D. G. A. Carter, The Institute of Chartered Accountants of British Columbia
V. Cinnamon, Cinnamon, Jang, Willoughby & Co.
R. Clark
G. Coombe, B.C. Telephone Company
J. A. Gardiner, Price Waterhouse Chartered Accountants
W. E. Gibson, Vancouver Financial Planning Consultants Inc.
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C. MacKenzie, B.C. Telephone Company
J. McCormack, Snowsell Jennens & Carter (Kelowna, B.C.)
T. Northup, Laurentian Pacific Insurance Company
P. Norwood, The Society of Management Accountants of British Columbia
F. Schiffner, B.C. Welding Supplies Ltd.
J. H. Stevens, Investment Dealers Association of Canada
W. H. Symons, Thorne Little Chartered Accountants
A. D. Vichert, International Financial Centre Vancouver
R. Williamson, Chevron Canada
B. Wolverton, Wolverton Securities Ltd.
P. Wright

HUMAN RESOURCE MANAGEMENT

Post-diploma Program

Organizations are comprised of individuals and groups of people aimed at successfully completing designated goals or objectives.

This program is designed for those who want to acquire specialized knowledge, skills and abilities about organizational systems and processes which focus upon enhancing human behavior in the workplace.

The career track of graduates is aimed at entrance, at a professional/technical level, into either a generalist or specialist human resource management position. Some graduates also find employment in operational units with a heavy emphasis on team management and project development activities. More experienced graduates also have an opportunity to pursue human resource consulting activities.

Students are exposed to current developments in a constantly changing human resource management field. They learn about the legal and labour relations management constraints affecting Canadian and international business operations.

The program develops skills and abilities focusing upon effective time and stress management, team work, making effective presentations, building a variety of interviewing and interpersonal counselling experiences, problem analyses and decision-making.

The program also gives participants exposure to the major computer and non computer-based systems and technologies that are used in human resource management programs: Human resource information, performance management, planning, pay and employment equity systems.

University or college graduates, or people with equivalent qualifications who are interested in human resource management specialization should consider this program. Institute graduates may also consider this program as part of a degree completion track.

The Program

The program consists of nine months of full-time study. Depending on previous courses taken, a student may be asked to substitute other courses for some of those shown below. Lectures are supplemented with case studies, group projects and discussions throughout the program.

Program Length

Nine months full-time beginning in September each year.

Total Fees (subject to change—Does not include book or supply costs)

$1,991.15 for the 9-month program (1993/94).

Prerequisites

College or University degree or Diploma of Technology plus FMGT 1152 (FMGT 109) (65% standing) and proficiency in microcomputer spreadsheet program operations; or equivalent.

Program: HUMAN RESOURCE MANAGEMENT

Level 1

BLAW	3100	Business Law
BUSA	3600	Microcomputer Applications 2 (Databases)
FMGT	3510	Finance 1
HRMG	3150	Human Resource Management Systems 1
HRMG	3170	Human Resource Dynamics Workshop
HRMG	3200	Industrial Relations
HRMG	3400	Compensation Management
OPMT	1510	Business Mathematics

Level 2

ECON	2200	Macroeconomics
FMGT	4510	Finance 2
HRMG	3300	Recruitment and Selection
HRMG	3500	Training and Development*
HRMG	4150	Human Resource Management Systems 2
HRMG	4200	Collective Bargaining
HRMG	4400	Benefits Administration*
HRMG	4600	Human Resource Planning*
HRMG	4900	Directed Studies (Human Resource Management Applications)
OCHS	1433	Introduction to Safety or Human Resources*

* Half term courses

Course Descriptions

BLAW 3100 (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.

BUSA 3600 (ADMN 360) Microcomputer Applications 2 (Databases)—Covers the process of building databases and applications with a commercial database package. Much of the course is generic in nature and many of the techniques, functions and procedures are applicable to database packages currently used in business. Prerequisite: BUSA 1600.

ECON 2200 (ADMN 200) Macroeconomics—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.

FMGT 3510 (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 and cash-planning, the cost of capital and working capital management. Prerequisite: FMGT 1152.

FMGT 4510 (FMGT 404) Finance 2—Instructs students in raising capital to finance a firm. Topics include capital budgeting; short, medium and long-term financing; leasing; security analysis; the Canadian capital and money markets as they affect business decisions of Canadian firms. Prerequisite: FMGT 3510.

HRMG 3150 (ADMN 341) Human Resource Management Systems 1—An introduction to systems and procedures associated with human resource information collection, storage and use for strategic and organizational human resource planning purposes. Course presents an overview of management functions, H.R. information systems, and applied H.R. research techniques. Two hours a week of microcomputer laboratory time are included for preparation of course assignments that use computer applications. Prerequisite: BUSA 1600 (or equivalent), ORGB 2100.

HRMG 3170 (ADMN 321) Human Resource Dynamics Workshop—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: ORGB 2100.

HRMG 3200 (ADMN 330) Industrial Relations—A detailed analysis of selected labour/management problem areas with emphasis on the solution of practical problems in industrial relations.

HRMG 3300 (ADMN 441) Recruitment and Selection—A skills development course emphasizing the interpersonal skills necessary for successful selection interviews. Training techniques include role-playing, individual counselling and feedback. Prerequisite: HRMG 3170.

HRMG 3400 (ADMN 346) Compensation Management—An introduction to wage and salary administration techniques including job analysis evaluation, compensation surveys, and pay-for-performance systems. Contemporary issues such as pay compression, pay equity and confidentiality are addressed.

HRMG 3500 (ADMN 442) Training and Development—Develops ability to design and implement a training program with emphasis on practical problems of training in industry. Prerequisite: HRMG 3150, 3170.

HRMG 4150 (ADMN 445) Human Resource Management Systems 2—A continuation of HRMG 3150 covering practical performance management systems and advanced HRIS systems management considerations. Current human resource management policy issues such as employment equity, affirmative action programming, employment testing and business ethics are also addressed. Two hours a week of microcomputer laboratory time are included for preparation of course assignments that use computer applications. Prerequisite: HRMG 3150.

HRMG 4200 (ADMN 430) Collective Bargaining—An introductory analysis of the fundamental issues and facts of labour-management relations. Special emphasis is given to collective agreement content and interpretation, bargaining and basic labour economics. Prerequisite: HRMG 3200.

HRMG 4400 (ADMN 447) Benefits Administration—Benefits planning from a total compensation perspective. A review of various benefit plans including health and insurance, pension, stock/share purchase, RRSP's, paid time off, workers compensation, and contemporary issues such as pension reform, mandatory retirement and employee assistance programming. Prerequisite: HRMG 3400.

HRMG 4600 (ADMN 446) Human Resource Planning—Presents the techniques for utilizing people potential within organizations. Topics include human resource demand and supply, analysis, future projections, sources of supply, identifying training needs, related strategic management objectives, budgeting and costing. Prerequisite: HRMG 3150.

HRMG 4900 (ADMN 490) Directed Studies—Designed to give students practical application of concepts learned in major program areas by engaging in problem-solving projects in business or government. Prerequisite: All courses in Level 1 or permission of the Program Head.

OCHS 1433 (OH&S 433) Introduction to Safety for Human Resources—Provides a basic understanding of Occupational Health and Safety. The course covers loss control principles, workers' compensation, claims management, WHMIS, safety program implementation, measurement, evaluation, accident investigation principles, inspection techniques and risk management.

OPMT 1510 (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.

Faculty and Staff

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B. Van der Woerd, B.A.
F.C. Williams, B.A. (Hons.), M.A.
R.A. Yates, LL.B., M.B.A.

HUMAN RESOURCE SYSTEMS

Diploma Program

Organizations are comprised of individuals and groups of people aimed at successfully completing designated goals or objectives.

This program is designed for those who want to acquire specialized knowledge, skills and abilities about organizational systems and processes which focus upon enhancing human behavior in the workplace.
The career track of graduates is aimed at entrance, at a professional/technical level, into either a generalist or specialist human resource management position. Some graduates also find employment in operational units with a heavy emphasis on team management and project development activities. More experienced graduates also have an opportunity to pursue human resource consulting activities.

Students are exposed to current developments in a constantly changing human resource management field. They learn about the legal and labour relations management constraints affecting Canadian and international business operations.

The program develops skills and abilities focusing upon effective time and stress management, team work, making effective presentations, building a variety of interviewing and interpersonal counselling experiences, problem analyses and decision-making.

The program also gives participants exposure to the major computer and non computer-based systems and technologies that are used in human resource management programs: Human resource information, performance management, planning, pay and employment equity systems.

The Program

Students complete the same Level 1 and Level 2 courses as in the Management Systems program. They then apply for acceptance into the Human Resource Systems program which begins with Level 3 (see also Direct Entry to Second Year).

Students who enter the Human Resource Systems 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.

Program Length

Two years full-time beginning in September each year.

Total Fees (subject to change—does not include book or supply costs)

$3,965.30 for the two-year program (1993/94).

Prerequisites

High school graduation with Math 11 and English 12, both with C+, are required for this program. Enrolment is limited. Applicants should apply early, stating full details of work experience, outlining extra-curricular activities and reasons for selecting this option.

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.

Specific Prerequisites

Applicants will be selected to enter the Human Resource Systems program after completion of all Level 1 and Level 2 courses, based on academic achievement, communication skills, maturity and relevant work experience.

Direct Entry for College, Institute or University Graduates

Direct entry into the second year of the Human Resource Systems program is possible for those who have previously graduated from a College or Institute Business Program or who have a university degree, or equivalent. As part of the selection process for direct entry, an interview may be required to review the applicant's academic record and work experience. This review may identify courses to be completed prior to admission into the program. See also Human Resource Management— Post-diploma Program.

Degree Completion

Continuation of studies to degree completion is recommended for graduates of this diploma.

Program: HUMAN RESOURCE SYSTEMS

Level 1		
BUSA	1100	Management
COMM	1100	Business Communication
COMP	1104	Introduction to Computing
ECON	2100	Microeconomics
FMGT	1100	Accounting 1
MKTG	1102	Essentials of Marketing
OPMT	1110	Business Mathematics
Level 2		
BUSA	1600	Microcomputer Applications 1 (Spreadsheets)
BUSA	2140	Entrepreneurial Management
COMM	2200	Business Communication
ECON	2200	Macroeconomics
FMGT	2100	Accounting 2
OPMT	1130	Business Statistics
ORGB	2100	Organizational Behavior
ORGB	2700	Organizational Behavior Workshop

Level 3

BLAW	3100	Business Law
BUSA	3500	Management Science
BUSA	3600	Microcomputer Applications 2 (Databases)
FMGT	3510	Finance 1
HRMG	3150	Human Resource Management Systems 1
HRMG	3170	Human Resource Dynamics Workshop
HRMG	3200	Industrial Relations
HRMG	3400	Compensation Management

Level 4

BUSA	4800	Management Policy
FMGT	4510	Finance 2
HRMG	3300	Recruitment and Selection
HRMG	3500	Training and Development
HRMG	4150	Human Resource Management Systems 2
HRMG	4200	Collective Bargaining
HRMG	4400	Benefits Administration
HRMG	4600	Human Resource Planning
HRMG	4900	Directed Studies
OCHS	1433	Introduction to Safety for Human Resources

Course Descriptions

BLAW 3100 (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.

BUSA 1100 (ADMN 102) Management—A study of the management functions of planning, organizing, staffing and controlling. Included are such topics as forms of business ownership, tactical and strategic planning, decision-making, structuring the organization, providing human resources and controlling operations. Students are given the opportunity to develop analytical and communication skills by analyzing and presenting solutions to typical business problems.

BUSA 1600 (ADMN 160) Microcomputer Applications 1 (Spreadsheets)—An introduction to microcomputers and software. Students become familiar with software programs to be used in other program areas. Prerequisite/Corequisite: COMP 1110.

BUSA 2140 (ADMN 214) Entrepreneurial Management—Students will investigate all factors involved in starting a business venture. Topics include: analyzing the market opportunity, developing a market strategy and marketing plan, financing the company, and dealing with legal implications. Students will develop a comprehensive business plan for a new business venture. Prerequisite: BUSA 1100, FMGT 1100

BUSA 3500 (ADMN 310) Management Science—Emphasizes the use of decision-making models in business. Trains students in the use of quantitative methods in the choice of alternatives in the decision-making process. Prerequisite: OPMT 1110, 1130.

BUSA 3600 (ADMN 360) Microcomputer Applications 2 (Databases)—Covers the process of building databases and applications with a commercial database package. Much of the course is generic in nature and many of the techniques, functions and procedures are applicable to database packages currently used in business. Prerequisite: BUSA 1600.

BUSA 4800 (ADMN 410) Management Policy—An analysis of business policy formulation designed to give the student practice, experience and confidence in handling complex business situations 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 acquaints 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 Program Head.

COMM 1100 (BCOM 100) Business Communication—Communicating on the job is a complex process which includes gathering and evaluating data, collaborating with co-workers, reporting to superiors, and presenting information and ideas. This introductory business course is designed to give students basic listening, writing and speaking skills which will allow them to prepare written and oral reports for BCIT courses and to proceed to more advanced communication courses.

COMM 2200 (BCOM 200) Business Communication—This course gives further instruction and practice in the principles taught in COMM 1100. It 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 processing. Prerequisite: COMM 1100.

COMP 1104 (COMP 108) Introduction to Computing—Lectures and practical exercises are used to present topics on computer terminology, hardware, software, DOS (Disc Operating System), and a word processing package.

ECON 2100 (ADMN 100) Microeconomics—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.

ECON 2200 (ADMN 200) Macroeconomics—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.

FMGT 1100 (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 2100. Topics include accounting as an information system, an introduction to accounting theory; income measurement; traditional record-keeping procedures; the accounting cycle; special journals; cash; merchandising operations; inventory estimation and costing.

FMGT 2100 (FMGT 201) Accounting 2—The follow-up to FMGT 1100. Topics include notes and accounts receivable, long-lived assets, liabilities, partnerships and corporations, cash-flow, manufacturing accounting, management accounting, consolidated statements and analysis of financial statements. Prerequisite: FMGT 1100.

FMGT 3510 (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 and cash-planning, the cost of capital and working capital management. Prerequisite: FMGT 2200 or 2180.

FMGT 4510 (FMGT 404) Finance 2—Instructs students in raising capital to finance a firm. Topics include capital budgeting; short, medium and long-term financing; leasing; security analysis; the Canadian capital and money markets as they affect business decisions of Canadian firms. Prerequisite: FMGT 3510.

HRMG 3150 (ADMN 341) Human Resource Management Systems 1—An introduction to systems and procedures associated with human resource information collection, storage and use for strategic and

organizational human resource planning purposes. Course presents an overview of human resource management functions, H.R. information systems and applied H.R. research techniques. Two hours a week of microcomputer laboratory time are included for preparation of course assignments that use computer applications. Prerequisite: BUSA 1600, ORGB 2100.

HRMG 3170 (ADMN 321) Human Resource Dynamics Workshop—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: ORGB 2100.

HRMG 3200 (ADMN 330) Industrial Relations—A detailed analysis of selected labour/management problem areas with emphasis on the solution of practical problems in industrial relations.

HRMG 3300 (ADMN 441) Recruitment and Selection—A skills development course emphasizing the interpersonal skills necessary for successful selection interviews. Training techniques include role-playing, individual counselling and feedback. Prerequisite: HRMG 3150, 3170.

HRMG 3400 (ADMN 346) Compensation Management—An introduction to wage and salary administration techniques including job analysis, job evaluation, compensation surveys and pay-for-performance systems. Contemporary issues such as pay compression, pay equity, and confidentiality are addressed.

HRMG 3500 (ADMN 442) Training and Development—Develops ability to design and implement a training program with emphasis on practical problems of training in industry. Prerequisite: HRMG 3150, 3200.

HRMG 4150 (ADMN 445) Human Resource Management Systems 2—A continuation of HRMG 3150 covering practical performance management systems and advanced HRIS systems management considerations. Current human resource management policy issues such as employment equity, affirmative action programming, employment testing, and business ethics are also addressed. Two hours a week of microcomputer laboratory time are included for preparation of course assignments that use computer applications. Prerequisite: HRMG 3150.

HRMG 4200 (ADMN 430) Collective Bargaining—An introductory analysis of the fundamental issues and facts of labour-management relations. Special emphasis is given to collective agreement content and interpretation, bargaining and basic labour economics. Prerequisite: HRMG 3200.

HRMG 4400 (ADMN 447) Benefits Administration—Benefits planning from a total compensation perspective. A review of various benefit plans including health and insurance, pension, stock/share purchase, RRSP's, paid time off, workers compensation; and contemporary issues such as pension reform, mandatory retirement and employee assistance programming. Prerequisite: HRMG 3400.

HRMG 4600 (ADMN 446) Human Resource Planning—Presents the techniques for utilizing people potential within organizations. Topics include human resource demand and supply, analysis, future projections, sources of supply, identifying training needs, related strategic management objectives, budgeting and costing. Prerequisite: HRMG 3150.

HRMG 4900 (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 Program Head.

MKTG 1102 (MKTG 102) Essentials of Marketing—An introductory course designed to provide the student with an overview of the marketing concept and how it can be applied to any type of organization or service. Material covered includes the controllable and uncontrollable elements of marketing, strategy planning, market characteristics, marketing research techniques, market segmentation and target market selection.

OCHS 1433 (OH&S 433) Introduction to Safety for Human Resources—Provides a basic understanding of Occupational Health and Safety. The course covers loss control principles, workers' compensation, claims management, WHMIS, safety program implementation, measurement, evaluation, accident investigation principles, inspection techniques and risk management.

OPMT 1110 (OPMT 110) Business Mathematics—Review of the basic mathematics applicable to business and industry. Mathematics of finance including retail operations, simple and compound interest, discounts, annuities, financial papers and depreciation methods. Emphasizes practical applications to business administration.

OPMT 1130 (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 of inferential statistics is provided through selected topics such as sampling, confidence limits of the mean, hypotheses testing and simple linear regression.

ORGB 2100 (ADMN 226) 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.

ORGB 2700 (ADMN 227) Organizational Behavior Workshop—This workshop will be used for more intensive instruction in interpersonal skills to complement ORGB 2100. Prerequisite/Corequisite: ORGB 2100.

Prerequisite Guide

Level 1

Acceptance into the program

Level 2

BUSA	1600	COMP 1104
ECON	2200	None
BUSA	2140	FMGT 1100/ MKTG 1102
ORGB	2100	None
ORGB	2700	ORGB 2100 (or Co-requisite)
BUSA	2280	MKTG 1102 (or Co-requisite)
COMM	2200	COMM 1100
FMGT	2100	FMGT 1100
OPMT	1130	None

Level 3

BUSA	3500	OPMT 1110 & OPMT 1130
HRMG	3170	ORGB 2100
HRMG	3200	None
HRMG	3100	ORGB 2100
HRMG	3150	ORGB 2100, BUSA 1600
BUSA	3600	BUSA 1600
BLAW	3100	None

Level 4

BUSA	4800	All Level 1 through 3 courses or permission of the program head
HRMG	4200	HRMG 3200
HRMG	3300	HRMG 3170/ HRMG 3150
HRMG	3500	HRMG 3170 /HRMG 3150
HRMG	4400	HRMG 3400
HRMG	4900	All Level 1 through 3 courses or permission of the program head
FMGT	4510	FMGT 3510
OCHS	1433	None

Faculty and Staff

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B. Van der Woerd, B.A.
F.C. Williams, B.A. (Hons.), M.A.
R.A. Yates, LL.B., M.B.A.

Advisory Committee

Doug Alley, B.C. Packers Limited
John Allanson, Weldwood of Canada Limited
Cliff Andstein, BCGEU
Debbie Bennett, Pacific Press Limited
Suzanne Bolton, Human Resource Consultant
Laurier Bourassa, The Loewen Group Inc.
Joe Breau, Vancouver General Hospital
Bob Clendenan, Chemetics International Company
Hugh Finlayson, School District No. 34 (Abbotsford)
David Gardner, Scott Paper Limited
David Harvey, BCIT Personnel/Employee Relations
John Hatchett, Prism Systems Inc.
Tim Hovis, B.C. Telephone Company
Brent Larsen, B.C. Hydro
Bill Mathieson, H.A. Simons Ltd.
Wendy March, St. Paul's Hospital
John Neilson, Insurance Corp. of B.C.
Sue Peterson, Surrey Memorial Hospital
Sarah Stanger, Pan Pacific Vancouver Hotel
Eileen Stewart, City of Vancouver
D'Arcy Warner, B.C. Gas Inc.

INTERNATIONAL TRADE

Diploma Program

International Trade is vital to the survival of Canada as one of the six most important trading nations in the world. Canada needs trained people to ensure continued growth and prosperity. Graduates of the International Trade program receive a broad training in the importing and exporting of goods and services. Importing and exporting depend upon market planning, market research and the ability to understand the different markets from a political, social and cultural perspective.

Job Opportunities

With the versatility of the International Trade program, graduates find employment in a wide range of differing industries and in a wide range of differing well paid careers. The International Trade program is ideal for those graduates seeking to establish themselves as entrepreneurs in exporting and importing. Other career opportunities occur in trading houses, customs brokers, freight forwarders and large companies with international and trans-provincial markets.

Program Length

Two years full-time beginning in September each year.

Total Fees (subject to change—does not include book or supply costs)

$3,965.30 for the two-year program (1993/94).

Prerequisites

High school graduation with Math 11 and English 12 both with C+. If your mathematical skills are in doubt, it is recommended that you take Preparatory Business Math OPMT 0199 (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: INTERNATIONAL TRADE

Level 1

BUSA	1100	Management
COMM	1100	Business Communication
COMP	1104	Introduction to Computing
ECON	2100	Microeconomics
FMGT	1100	Accounting 1
MKTG	1102	Essentials of Marketing
OPMT	1110	Business Mathematics
TDMT	1101	Geography of Trading
TDMT	1150	Distribution 1 (CITT)

Level 2

BLAW	3410	Business and International Law
COMM	2200	Business Communication
ECON	2200	Macroeconomics
FMGT	2100	Accounting 2
MKTG	2243	Sales Skills
OPMT	1121	Business Statistics
OPMT	1148	Industrial Engineering International/ Transportation
OPMT	1209	Computer Applications
TDMT	2203	Transportation Economics
TDMT	2250	Distribution 2 (CITT)

Level 3

FMGT	3550	Business Finance
MKTG	2309	Marketing Research 1
MKTG	3301	Quantitative Methods/Computer Applications in Marketing
OPMT	3353	Microcomputer Applications: Database
TDMT	2310	Introduction to Political Science
TDMT	3204	Integrated Purchasing
TDMT	3301	Logistics 1
TDMT	3305	International Trade
TDMT	3309	Marine Shipping and Insurance

Level 4

FMGT	4550	Management Accounting/International Finance
HRMG	3050	Management Workshop
MKTG	3409	Marketing Research 2
MKTG	4401	Marketing Planning
OPMT	1446	Quality Assurance (International)
TDMT	1409	Harmonized Systems FTA
TDMT	4401	Logistics 2
TDMT	4402	Introduction to Projects
TDMT	4411	Industry Project

Note: The program is continuously evolving and therefore may not be exactly as shown.

Course Descriptions

BUSA 1100 (ADMN 102) Management—A study of the management functions of planning, organizing, staffing and controlling. Included are such topics as forms of business ownership, tactical and strategic planning, decision-making, structuring the organization and providing human resources and controlling operations. Students are given the opportunity to develop analytical and communication skills by analyzing and presenting solutions to typical business problems.

COMM 1100 (BCOM 100) Business Communication—Communicating on the job is a complex process which includes gathering and evaluating data, collaborating with co-workers, reporting to superiors, and

presenting information and ideas. This introductory business course is designed to give students basic listening, writing and speaking skills which will allow them to prepare written and oral reports for BCIT courses and to proceed to more advanced communication courses.

COMM 2200 (BCOM 200) Business Communication—This course gives further instruction and practice in the principles taught in COMM 1100 (BCOM 100). It 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 processing. Prerequisite: COMM 1100.

COMP 1104 (COMP 108) Introduction to Computing—Lectures and practical exercises are used to present topics on computer terminology, hardware, software, DOS (Disc Operating System), and a word processing package and spreadsheets.

ECON 2100 (ADMN 100) Microeconomics—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.

ECON 2200 (ADMN 200) Macroeconomics—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.

FMGT 1100 (FMGT 101) Accounting 1—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 2100 (FMGT 201) Accounting 2—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 1100.

FMGT 3550/4550 (FMGT 342/442) Business Finance/Managerial Accounting/International 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. Prerequisite: FMGT 1100, 2100.

HRMG 3050 (ADMN 347) Management Workshop—Using the workshop approach, day-to-day management issues are explored. Specific topics include organizational behavior, industrial relations, interviewing skills, job evaluation and the introduction of change.

MKTG 1102 (MKTG 102) Essentials of Marketing—An introductory course designed to provide the student with an overview of the marketing concept and how it can be applied to any type of organization or service. Material includes the controllable and uncontrollable elements of marketing, strategy planning, market characteristics, marketing research techniques, market segmentation and target market selection.

MKTG 2309 (MKTG 309) Marketing Research 1—Examines the basic approaches to marketing research. 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.

MKTG 3301 (MKTG 301) Quantitative Methods/Computer Applications in Marketing—An examination of decision support systems utilizing mathematical modelling methods, data bank access, and computer-based information.

MKTG 3409 (MKTG 409) Marketing Research 2—See MKTG 2309. Prerequisite: MKTG 2309.

MKTG 4401 (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.

OPMT 1110 (OPMT 110) Business Mathematics—The course begins with basic mathematics applicable to business and industry. It then covers mathematics of finance including retail operations, simple and compound interest, discounts, annuities, financial papers and depreciation methods. Emphasis is on practical applications.

OPMT 1121 (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 1148 (OPMT 148) Industrial Engineering International/Transportation—Competitiveness and continuous productivity improvement are vital to all segments of industry. This is especially true in the highly competitive world of international trade and in the provision of logistics services. Through lectures, site visits, discussion and media articles, knowledge and techniques to ensure organizational effectiveness are explored. Students will learn some of the techniques used by highly productive and competitive companies.

OPMT 1209 (OPMT 209) Computer Applications 1—The course begins with a brief review of introductory DOS and Lotus concepts presented in COMP 1104. Then, the student will be introduced to more advanced Lotus commands and applications (larger and more professional worksheets, built-in functions, graphics, database, macros, transferring data to word processing documents). Some time will be devoted to advanced DOS topics (editing text files, creating batch files, etc.). Prerequisite: COMP 1104, OPMT 1110.

OPMT 1446 (OPMT 446) Quality Assurance (International)—An emphasis on quality is the key to survival in the international market place. This course covers basic concepts of product quality and reliability and discusses the fundamentals of company quality planning. Government support and national requirements for quality assurance in Canada, USA, Japan, the European Community, Pacific Rim and other developing countries are explored. International Standards Organization (ISO) standards for quality assurance and their effect on international trade are introduced. The topics are covered by lecture, class discussion, video and student presentations.

OPMT 3353 (OPMT 353) Microcomputer Applications Database—An examination of the need for automating an information storage and retrieval system. A case study is analyzed and a menu-driven system is developed using a standard relational database package. Topics include database creation, editing, querying; building custom reports, custom screens and labels; indexing, building multiple file relations; fundamentals of structured programming. Prerequisite: OPMT 2209, COMP 1104.

TDMT 1101 (TDMT 101) Geography of Trading—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 1150 (TDMT 150) Distribution 1 (CITT)—Provides the student with a complete overview of Canadian transportation regulations and modes including water, rail, highway, air and pipelines; intermediate transportation agencies; domestic and international transport rates, tolls and tariffs.

TDMT 1409 (TDMT 409) Harmonized Systems FTA—This course introduces the student to the new Harmonized System. The EEC, USA, and most OECD countries are on the same system of documentation and valuation for customs purposes. The course will also familiarize students with the Canada—USA Free Trade Agreement (FTA) regulations. Prerequisite: TDMT 3305.

TDMT 2203 (TDMT 203) Transportation Economics—Covers a variety of transportation services and 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 2250 (TDMT 250) Distribution 2 (CITT)—Provides the student with an overview of contracts; principles of marine insurance on cargo; warehousing; Canada Customs; damage prevention and claims, hazardous materials; materials handling; unitization devices; physical distribution; computer applications for transportation industries. Prerequisite: TDMT 1150.

TDMT 2310 (TDMT 310) Introduction to Political Science—Through lectures and individual research students will learn some of the social, cultural and political considerations when dealing with B.C.'s major export markets. Students prepare a research report on a country of their choice, identifying the primary political, social and cultural aspects of trading with that country.

TDMT 3204 (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 and 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 3301/4401 (TDMT 301/401) Logistics 1 and 2—An overview of the total distribution concept. Adding to previous information, the course examines distribution facility location analysis, information systems, control systems, distribution economics and profitability. With heavy emphasis on customer services and profitability, the course prepares the student to conduct transportation, customer service and complete distribution audits. Prerequisite: TDMT 3204.

TDMT 3305 (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: TDMT 2250, MKTG 2243.

TDMT 3309 (TDMT 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 4402 (TDMT 402) Introduction to Projects—In preparation for their fourth term projects (TDMT 4411) students are required to conduct a management level project, on campus, within BCIT. Students are required to demonstrate learned skills within set Terms of Reference that are mutually developed between the students and BCIT staff. Prerequisite: Successful completion of all Level 1, 2 and 3 courses.

TDMT 4411 (TDMT 411) Industry Project —The course is an opportunity to apply the knowledge from the program to a specific industry project for a sponsoring company.Prerequisite: successful completion of all Level 1, 2, 3 and 4A courses.

Faculty and Staff

G. Boleen, B.Comm., CITT
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Bill Hammond, Reed Stenhouse Limited
Ross Hodges, Casco Terminals
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Kevin Ouellette, Johnston International Services
Mike Palmer, Martin-Brower Canada Limited
Dorothee Schenkel, Magnacargo
Cheryl Wheaton, Corp. of the Township of Langley

MANAGEMENT SYSTEMS

Diploma Program

This program is designed to develop the comprehensive business knowledge and skills necessary to deal with the continually changing needs of business. The student is provided with a solid core of instruction in management, finance, marketing and business problem-solving, together with courses which will develop managers who can implement and use microcomputer-based information and decision systems. Graduates of the program will be effective in both larger business firms and in small business and entrepreneurial activity.

Job Opportunities

Graduates are ready to apply skills they have learned from accounting, operations management, marketing, mathematics, communications, business law, economics, organizational behavior, human resource management and computer applications directly in supervisory and management positions.

Graduates follow careers in a range of areas such as marketing and sales, banking and insurance. Other opportunities are to continue on to complete a university degree program or a professional accounting program, or to start your own business.

The Program

After the first year of core business courses, students will continue in the Management Systems Program or may apply for the Human Resource Systems Program. The optional courses within the second year of Management Systems are shown under the headings:

Option A—Management Systems and Option B—Microcomputers in Business

Students 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 program is revised and updated to reflect changes in business and industry.

Students in courses such as BUSA 1600 and BUSA 3600 will find it beneficial to have access to a microcomputer outside the Institute. Those who have outside access to microcomputers should so advise their instructors.

Program Length

Two years full-time beginning in September each year.

Total Fees (subject to change—does not include book or supply costs)

$3,965.30 for the two-year program (1993/94).

Prerequisites

High school graduation with Math 11 and English 12, both with C+, 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 strengthen applications. Applicants should be good communicators and people oriented, with a willingness to work effectively with fellow workers and the public.

Direct Entry

Entry into Level 2 or Level 3 of the program is possible when space is available, provided students have entrance prerequisites and the prerequisite courses for the level of entry.

Degree Completion/Advanced Studies

The Advanced Studies in Business program provides degree completion opportunities and an advanced diploma track.

Professional Certification

Graduates may earn advanced credit towards designation as a Chartered Accountant, a Certified General Accountant, or a Certified Management Accountant. Advanced credit is also given by the Institute of Chartered Secretaries and Administrators.

*Management Systems is currently under curriculum review. There may be some adjustments to courses described below.

Program: MANAGEMENT SYSTEMS

Level 1

BUSA	1100	Management
COMM	1100	Business Communication
COMP	1104	Introduction to Computing
ECON	2100	Microeconomics
FMGT	1100	Accounting 1
MKTG	1102	Essentials of Marketing
OPMT	1110	Business Mathematics

Level 2

BUSA	1600	Microcomputer Applications 1
BUSA	2140	Entrepreneurial Management
COMM	2200	Business Communication
ECON	2200	Macroeconomics
FMGT	2100	Accounting 2
OPMT	1130	Business Statistics
ORGB	2100	Organizational Behavior
ORGB	2400	Managing a Diverse Workforce
ORGB	2700	Organizational Behavior Workshop

Second-Year Options

Students will be asked their preference between OPTIONS A and B toward the end of Level 2. If resources or scheduling limit the space in OPTION B, student selection will be based on performance in previous microcomputer courses.

Courses which provide differing content between OPTIONS A and B are shown by *.

HRMG 3100 (ADMN 340) is taken by both OPTIONS A and B, but in different levels.

Option A: MANAGEMENT SYSTEMS

Level 3

BLAW	3100	Business Law
BUSA	3500	Management Science
BUSA	3600	Microcomputer Applications 2 (Databases)
FMGT	3221	Management Accounting
FMGT	3510	Finance 1
HRMG	3100	Human Resource Management
HRMG	3200	Industrial Relations
MKTG	2334	Applied Marketing and Selling

Level 4

BUSA	3710	Electronic Communications
BUSA	4620	Microcomputer Applications
BUSA	4800	Management Policy
BUSA	4900	Directed Studies
FMGT	4510	Finance 2
FMGT	4730	Computerized Accounting
OPMT	2170	Management Engineering
TDMT	1352	Transportation

Option B: MICROCOMPUTERS IN BUSINESS

Level 3

BLAW	3100	Business Law
BUSA	3500	Management Science
BUSA	3600	Microcomputer Applications 2 (Databases)
FMGT	3221	Management Accounting
FMGT	3510	Finance 1
HRMG	3200	Industrial Relations
MKTG	2334	Applied Marketing and Selling
OPMT	2173	Management Engineering

Level 4

BUSA	4600	Microcomputer Applications 3
BUSA	4800	Management Policy
BUSA	4900	Directed Studies
FMGT	4510	Finance 2
FMGT	4730	Microcomputer Accounting Systems
HRMG	3100	Human Resource Management
OPMT	1171	Materials Management
TDMT	1352	Transportation

Course Descriptions

BLAW 3100 (ADMN 385) Business Law—This is a one-term condensed course designed to provide the business student with a basic knowledge of Canadian law including the legal system, torts, contracts, sales of goods and consumer protection, secured transactions and creditors' protection, employment, agency, business organizations, negotiable instruments, real estate and administrative law. The long-term aim of this course may best be described as the inculcation of a sensitivity to and recognition of legal aspects of doing business, with a decided emphasis on prevention of legal difficulties, i.e. to know when to call a lawyer.

BUSA 1100 (ADMN 102) Management—A study of the management functions of planning, organizing, staffing and controlling. Included are such topics as forms of business ownership, tactical and strategic planning, decision-making, structuring the organization, providing human resources and controlling operations. Students are given the opportunity to develop analytical and communication skills by analyzing and presenting solutions to typical business problems.

BUSA 1600 (ADMN 160) Microcomputer Applications 1—This course is based on a managerial approach to microcomputers and software with the business end-user in mind. Students become familiar with the appropriate use of a spreadsheet as a decision support and modelling tool. Prerequisite: COMP 1104 or permission of Program Head.

BUSA 2140 (ADMN 214) Entrepreneurial Management—Students will investigate all factors involved in starting a business venture. Topics include: analyzing the market opportunity, developing a market strategy and marketing plan, financing the company and dealing with legal implications. Students will develop a comprehensive business plan for a new business venture. Prerequisite: BUSA 1100, FMGT 1100.

BUSA 2280 (ADMN 228) International Business—Global competition, modes of entry, market planning, and cross-cultural factors in international business. Prerequisite/Corequisite: MKTG 1102.

BUSA 3500 (ADMN 310) Management Science—This is an introductory course in Quantitative Methods. Students will be introduced to some of the more common techniques in the Management Science field, and will use microcomputer software to solve problems. Emphasis is placed on the formulation of problems and the interpretation of calculated results. Prerequisite: OPMT 1110, 1130.

BUSA 3600 (ADMN 360) Microcomputer Applications 2 (Databases)—This course covers the process of building databases and database applications with a commercial database package. It is based on a managerial approach to microcomputers and software with the business end-user in mind. Students become familiar with the appropriate use of a database as a decision support and modelling tool. Much of the course is generic in nature and many of the techniques, functions and procedures are applicable to many database packages currently used by businesses. Prerequisite: BUSA 1600.

BUSA 3710 (ADMN 421) Electronic Communications—This course focuses on the use and impact of networks and telecommunication technology in North American business. Prerequisite: BUSA 3600.

BUSA 4600 (ADMN 460) Microcomputer Applications 3—Topics vary but may include one or more of the following: advanced dBASE applications; micro to mainframe links; micro to micro links; telecommunication topics. Students may also conduct a detailed review of selected hardware/software. Prerequisite: BUSA 3600, FMGT 2100, OPMT 1110.

BUSA 4620 (ADMN 462) Microcomputer Applications—This half-term course introduces the Macintosh operating system and the design-layout and documentation of a HyperCard application. Much of the course is generic in nature and many of the techniques, functions and procedures are applicable to many object-oriented packages on the market. Other Macintosh software packages may also be explored. Prerequisite: BUSA 3600.

BUSA 4800 (ADMN 410) Management Policy—An analysis of business policy formulation designed to give the student practice, experience and confidence in handling complex business situations 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 acquaints 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 Program Head.

BUSA 4900 (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 Program Head.

COMM 1100 (BCOM 100) Business Communication—Communicating on the job is a complex process which includes gathering and evaluating data, collaborating with co-workers, reporting to superiors, and presenting information and ideas. This introductory business course is designed to give students basic listening, writing and speaking skills which will allow them to prepare written and oral reports for BCIT courses and to proceed to more advanced communication courses.

COMM 2200 (BCOM 200) Business Communication—This course gives further instruction and practice in the principles taught in COMM 1100. It 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 processing. Prerequisite: COMM 1100.

COMP 1104 (COMP 108) Introduction to Computing—Lectures and practical exercises are used to present topics on computer terminology, hardware, software, DOS (Disc Operating System), and a word processing package.

ECON 2100 (ADMN 100) Microeconomics—The course will focus on the analysis and operation of the firm in various types of market conditions. The course will cover three major areas: demand and supply, costs and the market structure of different Canadian industries. An understanding of this material will provide an analytical framework with which to assess business and government objectives in the Canadian economy.

ECON 2200 (ADMN 200) Macroeconomics—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.

FMGT 1100 (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 2100. 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 2100 (FMGT 201) Accounting 2—The follow-up to FMGT 1100. 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 1100.

FMGT 3221 (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 for product costing, cost allocations, performance measurement and decision-making models. Prerequisite: FMGT 2100, 2180.

FMGT 3510 (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 and cash-planning, the cost of capital and working capital management. Prerequisite: FMGT 2100, 2180.

FMGT 4510 (FMGT 404) Finance 2—How to raise capital to finance a firm. Topics include capital budgeting; short, medium and long-term financing; leasing; security analysis; Canadian capital and money markets as they affect business decisions of Canadian firms. Prerequisite: FMGT 3510.

FMGT 4730 (FMGT 418) Computerized Accounting—Requires the student to convert an existing business from a manual to a computer accounting system. The Bedford integrated accounting package will be used. Transactions will be recorded and financial statements produced. Prerequisite: FMGT 2100.

HRMG 3100 (ADMN 340) Human Resource Management—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: ORGB 2100.

HRMG 3200 (ADMN 330) Industrial Relations—A detailed analysis of selected labour/management problem areas with emphasis on the solution of practical problems in industrial relations.

MKTG 1102 (MKTG 102) Essentials of Marketing—An introductory course designed to provide the student with an overview of the marketing concept and how it can be applied to any type of organization or service. Topics include the controllable and uncontrollable elements of marketing, strategy planning, market characteristics, marketing research techniques, market segmentation and target market selection.

MKTG 2334 (MKTG 334) Applied Marketing and Selling—The focus is on applying the marketing concepts from the introductory marketing course. Emphasizes the development of personal selling skills. Students will develop a comprehensive plan for marketing and selling a product or service. Prerequisite: MKTG 1102.

OPMT 1110 (OPMT 110) 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, capitalized costs. Cash-flow analysis, NPV, IRR. Emphasis is on maximum use of pre-programmed calculator, and practical applications from the field of Financial Management.

OPMT 1130 (OPMT 130) Business Statistics—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, estimation, hypotheses testing, linear regression, correlation, index numbers and time series. Emphasis is on practical applications in the field of Financial Management.

OPMT 1171 (OPMT 171) Materials Management—The tools, procedures and philosophies that are used to plan, schedule and control manufacturing activities. Topics include inventory concepts, independent demand inventory systems, product planning, capacity planning, production and staffing plans, master production scheduling, material requirements planning and operations scheduling. M.R.P. II and Just-in-time/Total Quality Control are introduced. Prerequisite: OPMT 1110.

OPMT 2170 (OPMT 170) Management Engineering—This course focuses on two major aspects of administering an operation: process/productivity improvement and operations/materials management. In process/productivity improvement the students will use a systematic approach to problem identification, quantification, analysis and solution development and implementation, and facilities planning. In operations/material management, the student will examine the tools, procedures and philosophies that are used to control operations. Topics include inventory concepts, capacity planning, production and staff planning, master production scheduling and material requirements planning. M.R.P. II, Just-in-Time, Theory of Constraints and Total Quality Management are introduced. Prerequisite: OPMT 1110.

OPMT 2173 (OPMT 173) Management Engineering for Micro Systems—This course is an organized approach to productivity improvement and problem-solving in the service and manufacturing sectors of industry. Useful and powerful industrial engineering techniques such as activity sampling, process charting, critical examination, systematic selection of an optimal solution from alternatives and implementation strategies and the techniques used to plan and schedule projects within a project management philosophy. Prerequisite: OPMT 1110.

ORGB 2100 (ADMN 226) Organizational Behavior—The overall objective of the course is to help the individual become more effective in dealing with the human element in a business enterprise. Topics include individual factors such as personality, attitudes, perception and motivation; group factors such as communication, leadership, power and conflict; and organizational factors such as technology and job design.

ORGB 2700 (ADMN 227) Organizational Behavior Workshop—This workshop will be used for more intensive instruction in interpersonal skills to complement ORGB 2100. Prerequisite/Corequisite: ORGB 2100.

TDMT 1352 (TDMT 352) Transportation—This course is designed to provide the student with a thorough understanding of the overall management of logistical functions of an organization in domestic and international environments. Business logistics is the set of activities involved in the flow of materials and products through an organization to the market. This course examines management tools and principles applicable to these supply and distribution problems. Prerequisite: OPMT 1110, BLAW 3100.

Prerequisite Guide

Level 1

Acceptance into the program

Level 2

BUSA	1600	COMP 1104
BUSA	2140	BUSA 1100/FMGT 1100
BUSA	2280	MKTG 1102
COMM	2200	COMM 1100
FMGT	2100	FMGT 1100
OPMT	1130	None
ORGB	2100	None
ORGB	2700	ORGB 2100

Level 3

BLAW	3100	None
BUSA	3500	OPMT 1110 AND OPMT 1130
BUSA	3600	BUSA 1600
FMGT	3221	FMGT 3221
FMGT	3510	FMGT 2100
HRMG	3100	ORGB 2100
HRMG	3200	None
MKTG	2334	MKTG 1102

Level 4

BUSA	3710	BUSA 3600
BUSA	4600	BUSA 3600, FMGT 2100, OPMT 1110
BUSA	4620	BUSA 3600
BUSA	4800	All Level 1 through 3 courses or permission of the program head
BUSA	4900	All Level 1 through 3 courses or permission of the program head
FMGT	4510	FMGT 3510
FMGT	4730	FMGT 1101
OPMT	1170	OPMT 1110
OPMT	1171/	
OPMT	1173	OPMT 1110
TDMT	1352	OPMT 1110 & BLAW 3100

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John Hatchett, Prism Systems Inc.
Susan King, Touche Ross & Co.
Marcel Lowndes, Sauder Distribution
R.C. Miller, Pacemaker Homes
Ray Stone, The Dominion company
Duncan Watt

MARKETING MANAGEMENT

Diploma Program

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 viable, efficient operations.

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 Management Technology is designed to equip graduates with a solid generalist background, and allows students 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, the business communications industry, and tourism firms and services.

Job Opportunities

Marketing Communications graduates are employed in advertising and public relations firms, broadcasting and publishing firms, in-house marketing and promotion operations, and production companies.

*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 licensed or non-licensed positions within the Real Estate industry. (*Under curriculum review.)

The ***Tourism Management*** program prepares graduates for both private and public sector jobs in firms or organizations engaged in developing new tourism products and services or expanding the existing demand for these services.

The ***Professional Sales*** option prepares individuals for positions in distribution companies that sell their products and services to commercial buyers and purchasing agents.

The ***Small Business Development*** option is ideally suited to individuals planning to start their own businesses or becoming general managers in an established small firm.

Beginning Salaries

Beginning salaries for Marketing Management entry positions vary from $24,000 to $30,000 /annum for the majority of graduates. Those with extensive experience or additional educational qualifications command higher salaries. Profit sharing or performance bonus options are common.

The Program

In the first year, all Marketing Management students complete the same course of studies covering general business and economic principles. The second year offers specialization. Marketing Communication courses develop creative communication skills and campaign planning. Real Estate Studies addresses residential and commercial property sales and investment analysis skills. Tourism Management focuses on the operational and marketing aspects of a wide variety of tourism facilities and services. Professional Sales emphasizes sales skills, new product development and entrepreneurship. Small Business Development addresses the startup and growth planning needs of entrepreneurial firms.

Program Length

Two years full-time beginning in September each year.

Total Fees (subject to change—does not include book or supply costs)

$3,965.30 for the two-year program (1993/94).

Expenses

Students in some programs, eg: Tourism Management, incur additional expenses for field trips.

Direct Entry to Second Year

Direct entry into the second year of the program is possible when space is available, provided students have prerequisite first year courses and other suitable education or experience.

Advanced Training/ Degree Transfer and Completion

Marketing Management graduates can obtain transfer credit toward Business degree programs at a number of universities both within and outside the Province. As well, graduates may pursue degree completion through the Open University Bachelor of Administrative Studies program.

Accreditation

The Real Estate Option of the Marketing Management Program affords the opportunity to obtain Professional accreditation with both the British Columbia and Canadian Professional Real Estate bodies upon completion of their licensing and industry experience requirements.

Prerequisites

High school graduation with Math 11 and English 12 both with C+ are entry requirements for this technology. Completion of grade 11 and 12 science courses enhance chances for success in the program. A personal interview with the program faculty may be required to obtain final acceptance.

Candidates must state program preference: Marketing Communications, Real Estate, Tourism, Professional Sales or Small Business, when applying for admission to the first year of the Marketing Management Technology. Applications must be accompanied by a letter explaining your reason for taking the program and a resume. Applicants to the Marketing Communications program must also submit two letters of reference. 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.

Applicants to the Tourism Management program are urged to attend an information session offered each spring. These are free of charge. Sessions will be held in the IBM Building on Burnaby campus with signs posted at entrances advising of the room designated. Scheduled dates and times for Spring 1994 are as follows:

Saturday, February 19:	1000—1200
Friday, March 11:	1900—2100
Saturday, April 9:	1000—1200
Friday, May 6:	1900—2100

Technology: MARKETING

Level 1 (All Students)

BUSA	1100	Management
COMM	1100	Business Communication
COMP	1104	Introduction to Computing
ECON	2100	Microeconomics
FMGT	1100	Accounting 1
MKTG	1102	Essentials of Marketing
OPMT	1110	Business Mathematics

Level 2 (All Students)

COMM	2200	Business Communication
COMP	2104	Microcomputer Applications
ECON	2200	Macroeconomics
FMGT	2100	Accounting 2
MKTG	2202	Principles of Promotional Marketing
MKTG	2243	Sales Skills
OPMT	1130	Business Statistics
ORGB	2100	Organizational Behavior
TOUR	1260	Issues In Tourism (Tourism Program only)

Program: MARKETING COMMUNICATION

Level 3

BLAW	3100	Business Law
FMGT	3222	Management Accounting Marketing
MKTG	2309	Marketing Research 1
MKTG	3301	Quantitative Methods/Computer Applications in Marketing
MKTG	3317	Sales Promotion Management
MKTG	3339	Public Relations Management
MKTG	3417	Design Production

Level 4

MKTG	3409	Marketing Research 2
MKTG	4318	Media Planning
MKTG	4401	Marketing Planning
MKTG	4415	Promotion Strategy and Planning
MKTG	4416	Advertising Internship

*Program: REAL ESTATE STUDIES

*The Real Estate Studies program is currently under curriculum review. There may be some adjustments to the courses described below.

Level 3

FMGT	3223	Managerial Accounting for Real Estate and Small Business
MKTG	2309	Marketing Research 1
MKTG	3311	Real Estate Principles 1
MKTG	3312	Economics of Real Estate Markets
MKTG	3313	Introduction to Real Estate Finance
MKTG	3333	Real Estate Marketing and Management

Level 4

BLAW	3500	Law for Real Estate Marketing
MKTG	3409	Marketing Research 2
MKTG	4330	Real Estate Practice
MKTG	4411	Real Estate Management 2
MKTG	4412	Intro to Real Estate Appraisal and Investment Analysis
MKTG	4413	Mortgage Finance
MKTG	4418	Directed Studies

Program: TOURISM MANAGEMENT

Level 3

FMGT	3222	Management Accounting Marketing
MKTG	2309	Marketing Research 1
MKTG	3306	Principles of Small Business Management
TOUR	2301	Group Travel, Charters and Tours
TOUR	2303	Conventions, Meetings and Incentive Travel
TOUR	2305	Special Events, Trade Shows and Exhibitions
TOUR	2325	Tourism Product Development
TOUR	2344	Planning for Tourism Markets
TOUR	2900	Regional Tourism Field Study (Practicum)

Level 4

BLAW	3100	Business Law
HRMG	3100	Human Resource Management
MKTG	3409	Marketing Research 2
MKTG	4407	Case Studies—Entrepreneurship
TOUR	3411	Passenger Transportation Marketing
TOUR	3444	International Markets and Cultures
TOUR	4400	Development of Community Tourism
TOUR	4418	Directed Studies

Program: PROFESSIONAL SALES

Level 3

FMGT	3222	Management Accounting Marketing
MKTG	2309	Marketing Research 1
MKTG	3301	Quantitative Methods/Computer Applications in Marketing
MKTG	3302	Business-to-Business Marketing
MKTG	3338	New Product Development
MKTG	3343	Sales Management

Level 4

BLAW	3100	Business Law
MKTG	3305	International Marketing
MKTG	3409	Marketing Research 2
MKTG	4401	Marketing Planning
MKTG	4402	Advanced Sales Techniques
MKTG	4403	Industrial Sales Practicum
MKTG	4418	Directed Studies
MKTG	4430	Distributive Systems

Program:
SMALL BUSINESS DEVELOPMENT

Level 3

FMGT	3223	Managerial Accounting for Real Estate and Small Business
MKTG	2309	Marketing Research 1
MKTG	3301	Quantitative Methods/Computers Applications in Marketing
MKTG	3302	Business-to-Business Marketing
MKTG	3306	Principles of Small Business Management
MKTG	3343	Sales Management

Level 4

BLAW	3100	Business Law
MKTG	3305	International Marketing
MKTG	3409	Marketing Research 2
MKTG	4401	Marketing Planning
MKTG	4407	Case Studies/ Entrepreneurship
MKTG	4408	Business Planning Practicum
MKTG	4418	Directed Studies
MKTG	4430	Distributive Systems

Note: Program curriculum is under review and subject to change

Course Descriptions

BLAW 3100 (ADMN 385) Business Law—A one-term course. It 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.

BLAW 3500 (ADMN 387) Law for Real Estate Marketing—A nine-week course which covers the case law and legislation relevant to real property: interest in land, B.C. land registration system, agency, mortgages, tenancies, condominiums, real estate agents and land use planning.

BUSA 1100 (ADMN 102) Management—A study of the management functions of planning, organizing, staffing and controlling. Included are such topics as forms of business ownership, tactical and strategic planning, decision-making, structuring the organization, providing human resources and controlling operations. Students are given the opportunity to develop analytical and communication skills by analyzing and presenting solutions to typical business problems.

COMM 1100 (BCOM 100) Business Communication—Communicating on the job is a complex process which includes gathering and evaluating data, collaborating with co-workers, reporting to superiors, and presenting information and ideas. This introductory business course is designed to give students basic listening, writing and speaking skills which will allow them to prepare written and oral reports for BCIT courses and to proceed to more advanced communication courses.

COMM 2200 (BCOM 200) Business Communication—This course gives further instruction and practice in the principles taught in COMM 1100. It 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 processing. Prerequisite: COMM 1100.

COMP 1104 (COMP 108) Introduction to Computing—Lectures and practical exercises are used to present topics on computer terminology, hardware, software, DOS (Disc Operating System), and a word processing package.

COMP 2104 (COMP 210) Microcomputer Applications—An introduction to microcomputer applications using a database and spreadsheet package, the IBM mainframe and electronic mail.

ECON 2100 (ADMN 100) Microeconomics—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.

ECON 2200 (ADMN 200) Macroeconomics—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.

FMGT 1100 (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 2100. 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 2100 (FMGT 201) Accounting 2—The follow-up to FMGT 1100, topics include notes and accounts receivable, long-lived assets, liabilities, partnerships and corporations, cash-flow, manufacturing accounting, management accounting, consolidated statements and analysis of financial statements. Prerequisite: FMGT 1100.

FMGT 3222 (FMGT 303) Management Accounting Marketing—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 for product costing, cost allocations, performance measurement and decision-making models. Prerequisite: FMGT 2100.

FMGT 3223 (FMGT 329) Managerial Accounting for Real Estate and Small Business—A management accounting course that analyzes the accounting and financial aspects of various real estate and small business decision areas. Topics include commission sales, rental income, condominium management, financial statement analysis, property purchase and management, limited partnerships and real estate syndication. Traditional management accounting topics such as cost behavior, product pricing and relevant costs, as well as cost planning and control, are covered. Prerequisite: FMGT 2100.

HRMG 3100 (ADMN 340) Human Resource Management—An introduction to personnel management and staffing practices as applied in tourism related organizations. Students will articulate job specifications leading to written job descriptions, conduct employment interviews and apply current human rights and equity employment legislation to a variety of tourism operations. Performance appraisal techniques, disciplinary procedures and basic labour-management negotiation processes are discussed and applied. Prerequisite: ORGB 2100.

MKTG 1102 (MKTG 102) Essentials of Marketing—An introductory course designed to provide the student with an overview of the marketing concept and how it can be applied to any type of organization or service. Material includes the controllable and uncontrollable elements of marketing, strategy planning, market characteristics, marketing research techniques, market segmentation and target market selection.

MKTG 2202 (MKTG 202) Principles of Promotional Marketing—Presents an overview of promotional strategies; advertising, sales promotion and public relations. It is intended for those students pursuing the concentrated marketing program. The course examines campaign

planning, message design and media characteristics as they apply to product and service suppliers in both profit and non-profit sectors. The course also reviews the significance of marketing research, target marketing and market segmentation. Prerequisite: MKTG 1102.

MKTG 2243 (MKTG 243) Sales Skills—A course designed to cover the mechanics of salesmanship and the salespersons role in the firm.

MKTG 2309 (MKTG 309) Marketing Research 1—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 1102.

MKTG 3301 (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: Successful completion of all Level 2 courses.

MKTG 3302(MKTG 302) Business-to-Business 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 diversity of firms in British Columbia. Prerequisite: Successful completion of all Level 2 courses.

MKTG 3305 (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: Successful completion of all Level 2 courses.

MKTG 3306 (MKTG 306) Principles of Small Business Management—Examination of the planning stages involved in starting a new business including market, financial and legal feasibility requirements. Prerequisite: Successful completion of all Level 2 courses.

MKTG 3311 (MKTG 311) Real Estate Principles 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, location 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 graduates of the program, entering the real estate brokerage business, from the salesman's pre-licensing course. Prerequisite: Successful completion of all Level 2 courses.

MKTG 3312 (MKTG 312) Economics of Real Estate Markets—Covers the basic principles and concepts relating to urban land economics and provides the tools for analyzing the impact of economics on real estate markets. Prerequisite: Successful completion of all Level 2 courses.

MKTG 3313 (MKTG 313) Introduction to Real Estate Finance—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: Successful completion of all Level 2 courses.

MKTG 3317 (MKTG 317) Sales Promotion Management—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: Successful completion of all Level 2 courses.

MKTG 3333 (MKTG 333) Real Estate Marketing and Management—Reviews, reinforces and expands on the more important marketing concepts and theories taught in the introductory marketing course and examines how these concepts and theories can be applied to the real estate industry in a wide variety of areas. Particular emphasis will be placed on the development of real estate selling, negotiation and communication skills, and the development of real estate marketing programs and strategies. Prerequisite: Successful completion of all Level 2 courses.

MKTG 3338 (MKTG 338) New 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: Successful completion of all Level 2 courses.

MKTG 3339 (MKTG 339) Public Relations Management—A study of planning and executing a public relations program including communication techniques, media relations, special events and lobbying, budget development and management. Prerequisite: Successful completion of all Level 2 courses.

MKTG 3343 (MKTG 343) 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: Successful completion of all Level 2 courses.

MKTG 3409 (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 2309.

MKTG 3417 (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: Successful completion of all Level 2 courses.

MKTG 4318 (MKTG 318) Media Planning—Emphasis is placed on development and execution of the media plan. Close contact is maintained 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 in advertising agencies. Prerequisite: Successful completion of all Level 2 courses.

MKTG 4330 (MKTG 330) Real Estate Practice—Designed to apply the principles learned in MKTG 3311 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; how to search a title of real property at a land title office. Prerequisite: Successful completion of all Level 3 courses.

MKTG 4401 (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 3301.

MKTG 4402 (MKTG 402) Advanced Sales Techniques—Professional selling skills utilizing buyer behavior, product knowledge, time management and sales call planning tools. Computer applications in sales are also covered. Prerequisite: Successful completion of all Level 3 courses.

MKTG 4403 (MKTG 403) 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 4402.

MKTG 4407 (MKTG 407) Case Studies/Entrepreneurship—An analysis of both successful and unsuccessful ventures to reveal the role of the entrepreneur. Prerequisite: Successful completion of all Level 3 courses.

MKTG 4408 (MKTG 408) 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 4407.

MKTG 4411 (MKTG 411) Real Estate Management 2—A continuation of Real Estate Management 1. Prerequisite: MKTG 3311.

MKTG 4412 (MKTG 412) Introduction to Real Estate Appraisal and Investment Analysis—Designed for use by appraisers, real estate brokers, lenders, builders, investors 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 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, feasibility studies including investment analysis and the various indices used to measure a 'return.' For students seeking credit in recognized programs of professional appraising societies. Prerequisite: MKTG 3311.

MKTG 4413 (MKTG 413) Mortgage Finance—Will enable students to demonstrate a knowledge of the macroeconomic aspects of Canada's mortgage market; structure and analyze both residential and commercial mortgage loan applications; be familiar with loan management, contemporary repayment arrangements, development financing, participation loans, leasehold financing and appraisal for mortgage lending. Prerequisite: MKTG 3312.

MKTG 4415 (MKTG 415) Promotion Strategy and Planning—A capstone course in which students work in teams of five or six to develop and present to a client a comprehensive promotion campaign with real world constraints. Students incorporate theoretical concepts of marketing and promotions into practical applications in developing their client's campaign. Students practice "pitching" the account in competition with other teams. Prerequisite: Successful completion of all Level 3 courses.

MKTG 4416 (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: Successful completion of all Level 3 courses.

MKTG 4418 (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: Successful completion of all Level 3 courses.

MKTG 4430 (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: Successful completion of all Level 3 courses.

OPMT 1110 (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 1130 (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.

ORGB 2100 (ADMN 226) 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, change and decision-making; and micro or individual factors such as personality, attitudes, perception and motivation.

TOUR 1260 (TOUR 260) Issues in Tourism—Examines the evolution, function and direction of tourism at the macro level. Group discussion, case histories, brainstorming, and lecture formats. Topics include historical influences on tourism; basic components of community tourism; satisfying/ acknowledging minority interests; basic B.C. geography; government, associations and travel industry conflicts; psychology of travel including allo-psycho segmentation; demographics of travel and acculturation; tourism legacies; destination determination; training and educational issues for industry and the public.

TOUR 2301 (TOUR 301) Group Travel, Charters and Tours—The development, research and marketing of tour packages and charters provides a variety of employable skills resulting from this course. Practical exercises are given in tour planning, organizing, managing, guiding and marketing of tour/charter products. Terminology used by tour operators, wholesalers and destination management companies (D.M.C.'s) is applied in the costing, documentation and reservation systems used by firms in this growth sector of tourism. Prerequisite: TOUR 1260.

TOUR 2303 (TOUR 303) Conventions, Meetings and Incentive Travel—A marketing approach is accorded to this growth area of British Columbia's tourism industry. The course provides a basic understanding of convention/meeting planning; negotiating for special requirements in accommodation, transportation, attractions and hospitality sectors; amenities needed to satisfy delegates desire to attend as well as on-site demands; importance of speaker selection, workshop planning and scheduling; marketing strategies to enhance a convention/meeting to provide success in both "bottom line" and in satisfying the objectives of conference planners. Where possible, students will be provided an opportunity to assist a local conference group in a practicum format. Prerequisite: TOUR 1260.

TOUR 2305 (TOUR 305) Special Events, Trade Shows and Exhibitions—The planning, design and marketing of community, non-profit and corporate special events has developed into a major industry. The development of community festivals and charity events, with innovative marketing themes can lead to interesting career opportunities. Similarly the staging of a

corporate or educational trade show/exhibition, whether a stand-alone event or as a part of a convention or conference, involves professional talents and much planning and marketing skills to ensure success. Students will be able to apply knowledge and skills readily through a variety of interesting volunteer opportunities, developing excellent contacts and references. Prerequisite: TOUR 1260.

TOUR 2325 (TOUR 325) Tourism Product Development—Designed to familiarize the student with how a tourism product is initiated and marketed to suit a perceived need. Examines general demand factors, travel motivation, market segmentation, travel advertising, sales support, public relations, marketing risks and problems, statistical applications and analysis, researching markets for tourism products, and need for appropriate packaging. Prerequisite: TOUR 1260.

TOUR 2344 (TOUR 344) Planning for Tourism Markets—This course is a regional approach to tourism marketing with three accents: B.C. regions, nearest competing regions, domestic (North America) tourism in general. On completion of the course students will: 1) apply marketing principles to an appreciation of B.C.'s unique tourism and economic regions; 2) examine potential cooperative marketing strategies with B.C.'s neighbouring tourism regions (Washington, Idaho, Alaska, Alberta, Yukon and Northwest Territories); 3) develop basic research material on Canada's provinces and the United States as competing tourism regions for domestic and offshore markets. Prerequisite: TOUR 1260.

TOUR 2900 (TOUR 900) Regional Tourism Field Practicum—This field exercise will require students to visit one region or series of communities within B.C. to discover the tourism potential of the area, inventory current tourism products and services, assess resident awareness and attitudes toward the tourism industry, and evaluate the infrastructure and superstructure (plant) within the communities. A different routing and region will be visited each year. Interaction with Chambers of Commerce and municipal/regional elected and volunteer representatives, as well as tourism entrepreneurs and business/labour/interest groups will be involved. Field assignments and a term report on the exercise, as well as in-field participation with instructors, will form the evaluation on course completion. A supplementary fee will be payable for this course. Prerequisite: TOUR 1260.

TOUR 3411 (TOUR 411) Passenger Transportation Marketing—Competitive factors and regulatory changes have resulted in many changes to transportation firms. An understanding of these factors, with application of traditional marketing concepts will provide students with skills and knowledge to meet challenges of employment in airline, rail, coach and marine passenger systems. This course is focused on the marketing supply-demand issues, and includes discussion of infrastructure systems related to the various passenger transport forms. Prerequisite: Successful completion of all Level 2 courses.

TOUR 3444 (TOUR 444) International Markets and Cultures—This course is designed to develop a knowledge base about world tourism markets beyond the North American (CANADA & USA) geographical/ cultural sphere. The focus in on competitive factors and the diversity of world cultural heritages. The course objective is to provide an understanding of pleasure and business environs, and insights to share with the outbound public. The emphasis will vary from year to year with the changing world economic and political scene. Discussion will cover locational, simple cartography and physical geography along with relevant aspects of historical, cultural, language, social and political distinctions. Special focus will be given to the significant current and potential tourism features that are or could be offered by the nations and regions studied. Prerequisite: Successful completion of all Level 2 courses.

TOUR 4400 (TOUR 400) Development of Community Tourism—This foundation course in the Tourism program examines economic, social, environmental and entrepreneurial activities within a region or community. Business and marketing principles resulting from tourism—related activities are applied to communities in British Columbia, developing implementation strategies for sustainable growth of tourism sectors as a means of diversifying the economic and employment opportunities for residents. Cultural, social, environmental and recreational balances between residents and visitors are considered. A major group project provides opportunity for students to work with community planners, business and special interest groups in identifying practical needs and direction for communities to develop. Prerequisite: Successful completion of all Level 3 courses.

TOUR 4418 (TOUR 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: Successful completion of all Level 3 courses.

Faculty and Staff

R.W. Vandermark, B.A., Associate Dean
G. Bailey, R.I. (B.C.), F.R.I., C.M.R., C.R.A.
R.A. Brett, C.M.P., C.T.M., Dipl. T., I.D.P., Program Head, Tourism
D.T. Chapin, B.A., M.B.A.
M. Gerber, B.A., M.B.A.
G.T. Jacobs, B.A. (Hist. & Econ.), B.A., (Bus. Admin.) M.B.A., Ph.D.
C. McPherson, B.A., M.B.A.
C.G. Nelson, B.A., M.B.A., Program Head, Marketing Communications
M.D. Powley, B.Ed., M.B.A.
L. Rapchuk, B.Comm.
G.S. Rees, M.B.A.
M.I. Shacker, B.B.A.G.
D. Smith, B.A., M.B.A.
G. Urbshadt, B.Comm., Program Head, Technical Sales/Marketing
R.A. Venne, B.Comm., (Hons. Econ.), M.B.A.
C.D. Westcott, B.Sc., R.I. (B.C.), Program Head, Real Estate Studies
T. Winder, B.A., M.B.A.

Advisory Committee:

Marketing Communications

Margot Brown, Baker-Lovick Advertising
Bruce Davie, Journal of Commerce
Terry Dinsmore, BBM Bureau of Measurement
John Gattens, Western Broadcast Sales Limited
Joff Grohne, Karo Design Resources
Alice Gur-Arie, NOW Communication Group Inc.
Richard Hadden, Cossette Communication-Marketing
Richard Hill, Western Broadcast Sales
Cheryl Johnson, Events West
Ed Leclaire, Leclaire Hamilton
Don McQuaid, Masters Group
Carroll Nelson
Carole Wilson, Baker-Lovick Advertising Wilson
Della Smith, PJS Communications
John Taylor, Benwell Atkins Ltd.
Lloyd Warnes, Sage Resource Group

Advisory Committee: Real Estate Studies

Nicole Clark, Royal LePage
Murray DeGirolamo, CB Commercial Real Estate Group Canada Inc.
Larry Ferster, Royal LePage Real Estate Services Ltd.
Brad Haw, CB Commercial Real Estate Group Canada Inc.
Robert Laing, UBC
Bob Laurie, Urban Pacific Financial Corp.
Ben Minuk, Colliers, Macaulay Nicolls
Gary Nakagawa, Cumberland Consulting Corp.
Joe Pearson, National Real Estate Service
Bill Phillips, Royal LePage
Al Saunders, Edgecombe Properties Ltd.
Brian Woolley, Vigers Realty Ltd.

Advisory Committee:
Technical Sales and Marketing
Ruth Andermatt, Rogers Cantel Inc.
Dean Bertram, Prime Copy Products Ltd
Carol Borghesi, BC Tel
David Bryn-Jones,
OSTOP Osteoporosis Society of BC
Jim Ellis, ARTEC Equipment Co. Ltd.
Ross Erikson, Emerson Radio Canada Ltd.
Marcis Esmits, B.C.,
Business Information Centre
Bruce Gillespie, Right Associates
Paul Guiton, Paul Guiton & Assoc.
Anne Marie Neilson
Susan O'Connor
Vera Piccini, Rogers Cable
Noulan W. Bowker

Advisory Committee:
Tourism Management
Frank Addison, Addison Travel Marketing
Rick Antonson,
Great Canadian Railtour Company
Glyn Edwards, Destination Planners Inc.
Sheldon Eggen, Charter Bus Lines Inc.
Virginia Greene, Go-Direct Marketing
Phil Heard, B.C. Pavilion Corporation
Stuart Henderson, Sage Resource Group
Michael Horsey, Northwest Arena Corp.
David Hughes,
Peat Marwick Stevenson & Kellogg
Peter Kutney, Air B.C.
Trudy Lancelyn, Vancouver Board of Trade
Ray Lord, Science World—Administration
James MacGregor, Tourism &
Economic Development Group
Carole Misericardia, Waterfront Center Hotel
Robert Tuss, Bentley Pacific Ventures
Paul Vallee, Tourism Vancouver
John Williams, Pan Pacific Hotel

OPERATIONS MANAGEMENT

Diploma Program

Operations Managers are responsible for the production and distribution of goods and services that we buy and use every day. They may work in a manufacturing environment on the factory floor, a service organization such as an insurance company, government office, bank, airline or other large institution.

As a student in Operations Management, you will develop new personal strengths and learn how to apply them in a constructive way to change business systems. You will become a total system thinker and learn how to take personal responsibility for organizational change. You will also learn how to function as an effective team member. As a graduate of Operations Management you will have the technical and managerial skills required to assist organizations to minimize response times, reduce inventory, increase profits, quality of goods and services, and work life.

The program emphasizes business process improvement through people and communication skills; creativity, innovation, and problem-solving are focal points of the curriculum. These skills are supported by a mix of business and engineering courses in industrial engineering, total quality management, materials management, accounting, computer applications, systems analysis, quantitative methods and industrial relations.

Throughout the two-year program, students work in teams to solve industrial problems. Typical projects might be:

- To improve the work flow, methods and forms design in a bank.
- To develop an effective inventory control system for a building supply outlet.
- To recommend quality improvement procedures for a manufacturer.
- To design a new material handling system for a distributor.
- To develop a plant layout for an office chair manufacturer.
- To recommend and cost justify microcomputer hardware and software for a small company.
- To develop new methods and standards for assembling an architectural lighting fixture.
- To improve a service.

Job Opportunities

Graduates have found careers in a variety of industries including manufacturing, service, distribution and government. Typical entry-level positions include: assistant purchasing manager, assistant plant manager, business analyst, buyer, industrial engineering technologist, inventory analyst, maintenance coordinator, management engineer, management trainee, material planner/scheduler, methods analyst, purchaser, product analyst, production supervisor, project coordinator, quality assurance technologist, shipping/receiving supervisor, systems analyst, systems troubleshooter, or warehouse supervisor.

With related experience, Operations Management graduates may achieve positions as: computer sales representative, director of operations, general manager, inventory manager, management information systems manager, materials manager, operations manager, owner/operator, plant manager, president/CEO, production manager, project manager, quality manager, vice president operations.

Professional Membership

Operations Management students are excellent candidates to pursue professional membership in:

The Institute of Industrial Engineers
Canadian Association for Production & Inventory Control
American Society for Quality Control
Project Management Institute
International Facilities Management Association
Data Processing Management Association

Program Length

Two years full-time beginning in September each year.

Total Fees (subject to change—does not include book or supply costs)

$3,965.30 for the two year program (1993/94).

Degree Completion/ Advanced Studies

The BCIT Advanced Studies in Business program provides degree completion opportunities and an advanced diploma track. It is possible for graduates to complete a Bachelors degree in Administration offered by Lakehead University in one year, if they have the necessary prerequisites. The Open Learning Agency through its Open University also grants significant credit towards their Bachelor of Administrative Studies degree.

Prerequisites

High school graduation with Math 11 and English 12 both with C+; Physics 11 desirable. If your mathematical skills are in doubt, it is recommended that you take Preparatory Business Math OPMT 0199 (OPMT 099).

Program: OPERATIONS MANAGEMENT

Level 1

BUSA	1100	Management
CHSC	1122	Properties of Materials
COMM	1100	Business Communication
COMP	1104	Introduction to Computing
ECON	2100	Microeconomics
FMGT	1100	Accounting 1
MECH	1800	Interpretation of Technical Drawings
OPMT	1108	Applied Mathematics for Business/Industry
OPMT	1137	Industrial Engineering 1

Level 2

COMM	2200	Business Communication
ECON	2200	Macroeconomics
FMGT	2100	Accounting 2
OPMT	1207	Manufacturing Processes
OPMT	1208	Applied Statistics for Business/Industry
OPMT	1209	Computer Applications
OPMT	1258	Production and Inventory Management 1
OPMT	2237	Industrial Engineering 2
OPMT	2261	Information Systems 1
PHYS	1022	Applied Physics for Operations Management

Level 3

CDCM	1800	CAD for Operations Management
FMGT	3224	Cost Accounting: Operations Management
OPMT	2341	Quality Management
OPMT	2358	Production and Inventory Management 2
OPMT	3308	Quantitative Methods 1
OPMT	3337	Industrial Engineering 3
OPMT	3340	Industrial Automation
OPMT	3361	Information Systems 2
ORGB	2110	Organizational Behavior

Level 4

HRMG	3090	Supervising Human Resources
HRMG	3200	Industrial Relations
MKTG	1115	Fundamentals of Marketing
OCHS	1441	Introduction to Safety for Operations Management
OPMT	2405	Purchasing
OPMT	3458	Production and Inventory Management 3
OPMT	4408	Quantitative Methods 2
OPMT	4437	Industrial Engineering 4
OPMT	4438	Entrepreneurial Business Plan Development
OPMT	4461	Information Systems 3

Course Descriptions

BUSA 1100 (ADMN 102) Management—A study of the management functions of planning, organizing, staffing and controlling. Included are such topics as forms of business ownership, tactical and strategic planning, decision-making, structuring the organization and providing human resources, and controlling operations. Students are given the opportunity to develop analytical and communication skills by analyzing and presenting solutions to typical business problems.

CDCM 1800 (CDCM 323) CAD for Operations Management—Rudiments of computer-aided drafting. Machine log-on procedures. Simple 2-D drawings, orthographic projection, dimensioning and annotations.

CHSC 1122 (CHSC 122) Properties of Materials—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.

COMM 1100 (BCOM 100) Business Communication—Communicating on the job is a complex process which includes gathering and evaluating data, collaborating with co-workers, reporting to superiors, and presenting information and ideas. This introductory business communication course is designed to give students basic listening, writing and speaking skills which will allow them to prepare written and oral reports for BCIT courses and to proceed to more advanced communication courses.

COMM 2200 (BCOM 200) Business Communication—This course gives further instruction and practice in the principles taught in COMM 1100. It 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 processing. Prerequisite: COMM 1100.

COMP 1104 (COMP 108) Introduction to Computing—Lectures and practical exercises are used to present topics on computer terminology, hardware, software, DOS (Disc Operating System), spreadsheets, and a word processing package.

ECON 2100 (ADMN 100) Microeconomics—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.

ECON 2200 (ADMN 200) Macroeconomics—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.

FMGT 1100 (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 2100. Topics include accounting as an information system, an introduction to accounting theory; income measurement; traditional record-keeping procedures; the accounting cycles; special journals; cash; merchandising operations; inventory estimation and costing.

FMGT 2100 (FMGT 201) Accounting 2—The follow-up to FMGT 1100, topics include notes and accounts receivable, long-lived assets, liabilities, partnerships and corporations, cash-flow, manufacturing accounting, management accounting, consolidated statements and analysis of financial statements. Prerequisite: FMGT 1100.

FMGT 3224 (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. Period, cash and capital budgeting are reviewed and supported by PC simulation software applications. Prerequisite: FMGT 1100 or 2100.

HRMG 3090 (ADMN 343) Supervising Human Resources—Integrates materials covered in other HRMG courses and provides the student with the skills required to survive as a supervisor. Topics include the selection process, interviewing, job evaluation/compensation, performance appraisal, training and typical supervisor problems. Prerequisite: ORGB 2110.

HRMG 3200 (ADMN 330) Industrial Relations—A detailed analysis of selected labour/management problem areas with emphasis on the solution of practical problems in industrial relations.

MECH 1800 (MECH 102) Interpretation of Technical Drawings—Introduces students to engineering drawing 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 freehand sketching.

MKTG 1115 (MKTG 115) Fundamentals of Marketing—An introductory course that provides an overview of the marketing concept.

OCHS 1441 (OH&S 441) Introduction to Safety for Operations Management—Introduction to industrial health and safety. Introduction to safety and accident prevention, accident report writing, safety in the workplace.

OPMT 1108 (OPMT 108) Applied Mathematics for Business/Industry—Through lectures, supervised class assignments, and home assignments, the course covers business uses of arithmetic, algebra, functions, simple interest, compound interest, the concept of present value, annuities, mortgages, sinking funds, depreciation methods and techniques used in evaluating investment decisions.

OPMT 1137 (OPMT 137) Industrial Engineering 1—This course presents a systematic approach to method study and productivity improvement. Under the general philosophy of cooperative learning, through lectures, case studies and classroom exercises, the student will learn the six step process to: Select opportunity for improvement, record the data of the present situation, examine the present method, develop a new method, install the new method, maintain the new method. Various industrial engineering techniques covered in the course are: Pareto's Law, activity sampling, multiple activity charting, time study, critical examination and the multiple criteria evaluation matrix. Basic principles of materials handling and basic consulting skills will be introduced.

OPMT 1207 (OPMT 207) Manufacturing Processes—This course is divided into two major sections. Section 1 deals with common manufacturing processes encountered by Operations Management graduates in the metal, plastic, wood product, cement/concrete, composite and textile industries. Section 2 focuses on the terminology, common components and manufacturing processes in electronic manufacturing plants. Prerequisite: CHSC 1122.

OPMT 1208 (OPMT 208) Applied Statistics for Business/Industry—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 1258 (OPMT 258) Production and Inventory Management 1—As global competition becomes increasingly fierce, manufacturers and distributors are looking for faster and more cost effective ways to make products and control their inventories. This is the first of three courses on production and inventory management in the Operations Management program. Together, these courses cover techniques, philosophies and tools used by industry to improve their competitive advantage. This course introduces the major topics to be covered throughout the three courses and features essential inventory management skills.

OPMT 2209 (OPMT 209) Computer Applications—The course begins with a brief review of the introductory DOS and Lotus concepts presented in COMP 1104. Then, the student will be introduced to more advanced Lotus commands and applications (larger and more professional worksheets, built-in functions, graphics, database, macros, transferring data to word processing documents). Some time will be devoted to advanced DOS topics (editing text files, creating batch files, etc.). Prerequisite: COMP 1104.

OPMT 2237 (OPMT 237) Industrial Engineering 2—This is a second level problem-solving course which expands upon the SREDIM systems analysis model. In the course students will be introduced to problem-solving techniques, predetermined time standards, plant layout, material handling, process flow planning, production and inventory planning, applied ergonomics, motion economy, feasibility studies, method costing and simplified systematic layout planning. Prerequisite: OPMT 1137.

OPMT 2261 (OPMT 261) Information Systems 1—An introduction to a variety of techniques for analyzing and improving administrative support systems within organizations. Topics include: organizing for process improvement, flowcharting process characteristics, streamlining the process, measurements, feedback and action. Continuous improvement in the business process environment will be introduced. Prerequisite: OPMT 1137.

OPMT 2341 (OPMT 341) Quality Management—Modern concepts of quality management for the manufacturing industries. Topics include inspection, quality control and quality assurance; organization; quality system functions and documentation requirements; supplier quality assurance; product reliability; Canadian national standards for quality program. Prerequisite: OPMT 1208.

OPMT 2358 (OPMT 358) Production and Inventory Management 2—A continuation of OPMT 1258. This course covers production planning and scheduling techniques. Students will develop a production plan, a master schedule, a material requirements plan and a detailed shop floor schedule for a product group. Manufacturing Resource Planning (MRP II) and finite capacity scheduling will be covered. Prerequisite: OPMT 1258.

OPMT 2405 (OPMT 405) Purchasing—This course examines the fundamental principles and practices of procurement. Topics include procurement objectives, information systems, specifications, supplier selection, pricing, negotiations and disposal. Prerequisite: OPMT 1258.

OPMT 3308 (OPMT 308) Quantitative Methods for Management—This course is designed to increase your quantitative problem-solving skills. It will focus on the use of models, some of which are fairly standard and others which the student will develop either by combining parts of existing models or by starting from scratch in the case of simulation models. Extensive use will be made of skills learned in previous courses particularly business mathematics, statistics, economics, programming, spreadsheets and communications. Prerequisite: OPMT 1208, 2209.

OPMT 3337 (OPMT 337) Industrial Engineering 3—This industrial engineering course builds on the foundation established with OPMT 1137 and 2237. The course continues to focus on the tools and techniques used to improve operations in both the industrial and service sectors of the economy. The application of TQM philosophies and Continuous Improvement will be studied. The improvement of operations measures of present performance must be understood, developed and implemented. Prerequisite: OPMT 1208, 2237.

OPMT 3340 (OPMT 340) Industrial Automation—Enables the student to understand the role of manufacturing automation in the productivity improvement process including CAM and robots. The concepts of flexible manufacturing systems, group technology and computer integrated manufacturing are explored. Prerequisite: OPMT 1207, 2237.

OPMT 3361 (OPMT 361) Information Systems 2—An introduction to computerized management information systems and the use of industry-standard software to meet the reporting needs of management and provide decision support. Prerequisite: OPMT 2209, 2261.

OPMT 3458 (OPMT 458) Production and Inventory Management 3—This is the third of three courses in the Operations Management program on production and inventory management. This course describes and analyzes how companies achieve world class manufacturing performance. Two widely used management philosophies are covered: Just-in-Time/Total

Quality Control (JIT/TQC) which was developed in Japan, but has since been implemented in thousands of North American companies including several in B.C., and Theory of Constraints (TOC). TOC embraces many of the concepts of JIT/TQC philosophy. But TOC goes beyond JIT/TQC and departs from it in several critical ways, making TOC what many believe to be the next generation management philosophy. Prerequisite: OPMT 2237, 2341, 2358.

OPMT 4408 (OPMT 408) Quantitative Methods 2—A continuation of OPMT 3308. Prerequisite: OPMT 3308.

OPMT 4437 (OPMT 437) Industrial Engineering 4—A continuation of OPMT 3337, presented in three sections. A minimum mark of 50% must be earned in each of the three segments (A, B & C) to successfully complete this part of the program.

A) Starting with Gantt charting, students will learn arrow and precedence techniques. Updating projects to control ongoing projects will be shown. Analyzing resource usage by means of time logic diagrams will be covered. Techniques for project crashing and levelling will be learned. The assignment will centre around developing and using a critical path for the industrial project that is to be covered in segment B.

B) This section is intended to integrate a variety of industrial engineering activities into a comprehensive community of learning experiences. It will focus on the development of an operations plan for the manufacture of a product. This part of the course will also include value analysis, operations planning, materials handling and equipment selection, plant layout, ergonomics, work place layout and product costing.

C) Students will work in groups of three and address managerial problems as outlined by various BCIT staff and faculty. In preparation for the 4th term projects, student groups are required to address a management level problem using appropriate problem-solving techniques and negotiated terms of reference. **Successful completion will be identified by complete compliance with the project terms of reference.**

Prerequisite: OPMT 3337.

OPMT 4438 (OPMT 438) Entrepreneurial Business Plan Development—Examines the planning stages involved in starting a new business including market, financial and legal requirements.

OPMT 4461 (OPMT 461) Information Systems 3—The microcomputer system cycle (preliminary investigation, detailed investigation, software selection and design, implementation, and maintenance) will be examined with emphasis on the packaged software approach. Related topics (industry trends, relevant technology, leading edge software, etc.), will be presented as time permits. This course builds on material covered in several lower level courses. Prerequisite: OPMT 3361.

ORGB 2110 (ADMN 220) Organizational Behavior—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, job design, intergroup dynamics and conflict will be examined.

PHYS 1022 (PHYS 227) Applied Physics: Operations Management—This introductory course deals with the basic concepts in physics which relate to industrial techniques and processes. Calculation and problem-solving skills are emphasized; WCB regulations are included as appropriate. There is a lab component which introduces data analysis software. Topics include statics, kinematics, dynamics, work/energy/power, simple machines, optics/illumination, acoustics, vibration, heat and electricity (DC circuits, magnetism, motors and generators, AC basics).

Faculty and Staff

G. Boleen, B.Comm., CITT
C. Chan, M.B.A.
S. Corning, Dipl.T.
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.
K.C. Hartley, B.A. Sc., P. Eng., C.P.I.M., Program Head
A. S. Lee, B. Eng., P. Eng., M.Ed.
J. E. Lloyd, M.Ed., P. Eng., Chief Instructor
D.W. Malcolm, B.Sc., A.Sc.T.T.
D.J. Mallory, B.A.Sc., M.A., Ph.D., Chief Instructor
J.A.I. Millette, B.A., M.Ed.
G.W. Murray, Dipl.T., Chief Instructor
J. Ribic, B.I.E.
G. Sagar, B.A.Sc., M.B.A.
W.J. Sheriff, B.A., B.Sc.
C.V. Spong, Dipl.T., Chief Instructor
J. Young, B.Sc., M.B.A., P.Eng
W. Ratzburg, B.Sc., Dip Ed., M.B.A.
Ron Wlock, B.A. Sc., P.Eng.

Advisory Committee

Greg Fleck, Roland D.G. Canada Incorp.
Mats Gerschman, Glenayre Electronics
Brian Holmes, Columbia Plastic Ltd.
Diana MacKay, Vancouver General Hospital
Bruce Marsh, Coopers & Lybrand Consulting Group
Iain McLean, Ballard Power Systems Inc.
Graham Parkes, Discovery Innovation Centre
Mr. Pat Schooley, Beaver Lumber
Jim Rae, BTE
Dave Roberts
Merv Stanley, BC Tel
Glen Thorne, Weatherhaven Resources Ltd.
Pat Turner, Kirkland & Rose Ltd.

OPERATIONS MANAGEMENT SENIOR CERTIFICATE FOR TRADESPERSONS

Certificate Program

The Career Renewal Program For The 21st Century

This program is designed to prepare experienced tradespersons or process specialists for employment challenges through to the next century.

Program Aim

To enhance your employability by building on your life and career experiences with specific academic, personal teamwork skills.

Program Summary

Students develop their personal managerial capabilities by critically examining the concepts of continuous improvement as applied to the process/project, purchasing, quality and information functions of an organization.

This examination is enhanced with communication, analytical problem-solving, computer and leadership skills training.

Job Opportunities

The program expands career alternatives enabling graduates to assume managerial positions or to become self-employed. Typical job functions that graduates may assume include:

- Project Manager
- Maintenance Superintendent
- Production Planner
- Warehouse Manager
- Operations Manager
- Materials Administrator
- Inventory Administrator
- Technical Salesperson
- Buyer

Possible Sponsorships

You may qualify for financial support while enrolled in this program. The specific funding programs that could assist you are:

- Workers' Compensation Board Rehabilitation Program, and
- Unemployment Insurance Retraining Program

Your eligibility for either of these programs can be verified at your local Canada Employment Centre or by contacting your WCB advisor.

The Ideal Candidate

This program is most attractive to persons who have a Journeyed Certification, are process specialists or equivalent, with three to five years post-certificate trades experience.

In addition, each applicant will have completed a Math 11 and English 12 course with C+ or equivalent. Interested applicants should update their resumes and phone the Program Head for an interview, and be available to upgrade prerequisite courses.

Program Length

Nine months full-time beginning in September each year.

Total Fees (subject to change—does not include book or supply costs)

$1,991.30 for the nine-month program.

Program: CERTIFICATE FOR TRADESPERSONS

Level 1	September- December (15 weeks)	
BUSA	1100	Management
COMM	1101	Communication for Senior Technicians
COMP	1104	Introduction to omputing
FMGT	1151	Accounting Essentials for Small Business
OPMT	1109	Industry Practicum
OPMT	1110	Business Mathematics
OPMT	1146	Industrial Engineering 1
OPMT	1147	Production/Inventory Management 1

Level 2A	January—March (10 weeks)	
COMM	2201	Communication Senior Technicians
MKTG	1114	Basic Marketing Principles
OPMT	1202	Introduction to Quantitative Methods
OPMT	1220	Skill Application
OPMT	2201	Principles of Supervision
OPMT	2246	Industrial Engineering 2
OPMT	2247	Production/Inventory Management 2
OPMT	2253	Microcomputer Applications

Level 2B	March—May (10 weeks)	
BUSA	2140	Entrepreneurial Management
COMM	2201	Communication Senior Technicians
HRMG	2010	Industrial Relations (Basics)
OPMT	1202	Introduction to Quantitative Methods
OPMT	1230	Career Search
OPMT	1441	Industrial Health & Safety
OPMT	2246	Industrial Engineering 2
OPMT	2247	Production/Inventory Management 2
OPMT	2253	Microcomputer Applications

Note: Program curriculum under review and subject to change.

Course Descriptions

BUSA 1100 (ADMN 102) Management—A study of the management functions of planning, organizing, staffing and controlling. Included are such topics as forms of business ownership, tactical and strategic planning, decision-making, structuring the organization and providing human resources, and controlling operations. Students are given the opportunity to develop analytical and communication skills by analyzing and presenting solutions to typical business problems.

BUSA 2140 (ADMN 214) Entrepreneurial Management—Students will investigate all factors involved in starting a business venture. Topics include analyzing the market opportunity, developing a market strategy, financing the company or activity, and dealing with legal implications. Students will develop a comprehensive business plan for a domestic business. Prerequisite: BUSA 1100, FMGT 1100.

COMM 1101 (COMM 100) Communication Senior Technicians—

COMM 2201 (COMM 200) Business Communication Senior Technicians
-Prerequisite: COMM 1101.

COMP 1104 (COMP 108) Introduction to Computing—Lectures and practical exercises are used to present topics on computer terminology, hardware, software, DOS (Disc Operating System), and a word processing package.

FMGT 1151 (FMGT 104) Accounting Essentials for Small Business—Covers the minimum accounting procedures with which the owner of a business should be familiar. Topics include recordkeeping, budgeting and cash flow, financial statements, funding mechanisms and legal requirements.

HRMG 2010 (ADMN 232) Industrial Relations (Basics)—A detailed analysis of selected labour/management problem areas with emphasis on the solution of practical problems in industrial relations.

MKTG 1114 (MKTG 114) Basic Marketing Principles—An introductory course designed to provide the student with an overview of the marketing concept and how it can be applied to any type of organization or service. Topics include the controllable and uncontrollable elements of marketing, strategy planning, market characteristics, marketing research techniques, market segmentation and target market selection.

OPMT 1110 (OPMT 110) Business Mathematics—Review of the basic mathematics applicable to business and industry. Mathematics of finance including retail operations, simple and compound

interest, discounts, annuities, financial papers and depreciation methods. Emphasizes practical applications to business administration.

OPMT 1146 (OPMT 146) Industrial Engineering 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 1147 (OPMT 147) Production/Inventory Management 1—The emphasis of this course and the continuing course 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 are also covered.

OPMT 1202 (OPMT 202) Introduction to Quantitative Methods—Offers students the basics of descriptive statistics and explores the application of a relevant microcomputer package to quality control in an industrial setting.

OPMT 1220 (OPMT 220) Skill Application—Students will be given the opportunity to evaluate the applicability of program material in a variety of diverse businesses. Field trips and interviews with various practitioners will be used to help with this understanding. Students will be given an opportunity to experiment with techniques in a firm.

OPMT 1230 (OPMT 230) Career Search—This course is designed to assist students to objectively evaluate their new skills and to determine the industry and job classification that best suits their training and work experience. Students will then implement a systematic search to identify and secure a position that best suits their credentials.

OPMT 1441 (OPMT 441) Industrial Health and Safety—Introduction to industrial health and safety, accident prevention, accident report writing, safety in the workplace.

OPMT 2201 (OPMT 201) Principles of Supervision—Integrates the prerequisite courses and provides the student with the skills required to survive the initial period as a first-line supervisor. Topics include the role of the supervisor, authority relationships, how to lead, delegate, discipline and evaluate. On the job training and time management will also be covered. Prerequisite: BUSA 1100.

OPMT 2246 (OPMT 240) Industrial Engineering 2—Builds on OPMT 1146 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. Prerequisite: OPMT 1146.

OPMT 2247 (OPMT 247) Production/Inventory Management 2—A continuation of OPMT 1147. 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). Prerequisite: OPMT 1147.

OPMT 2253 (OPMT 253) Microcomputer Applications—Through lectures, labs and project work, this course will deal with spreadsheet and database software as applied in an industrial setting. Prerequisite: COMP 1104, OPMT 1110, FMGT 1151.

Faculty and Staff

G. Boleen, B.Comm., CITT
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Ron Wlock, B.A. Sc., P.Eng.

TRANSPORTATION LOGISTICS

Diploma Program

Transportation is the vital link between supplier and customer both within and outside Canada's borders. Employees must be flexible and well equipped with the skills necessary to participate in the shrinking world market. The Transportation Logistics program enables graduates to contribute towards the effective movement of goods, people and services between supplier and customer. All modes of transportation are studied together with the rules and regulations governing inter-provincial and international transportation.

Job Opportunities

Transportation Logistics graduates are employed in the organizing, buying and selling of transportation services. Graduates can choose from a variety of dynamic, well paid careers in marine shipping, airlines, railroads, trading, customs brokering, freight forwarding, poolcar operations, manufacturing and warehouse and distribution centres.

Program Length

Two years full-time beginning in September each year.

Total Fees (subject to change—does not include book or supply costs)
$3,965.30 for the two-year program (1993/94).

Prerequisites

High school graduation with Math 11 and English 12 both with C+. If your mathematical skills are in doubt, it is recommended that you take Preparatory Business Math OPMT 0199. It is also recommended that potential students acquire basic typing skills due to the extensive use of computers in the program.

Program: TRANSPORTATION LOGISTICS

Level 1

BUSA	1100	Management
COMM	1100	Business Communication
COMP	1104	Introduction to Computing
ECON	2100	Microeconomics
FMGT	1101	Accounting Basics 1
MKTG	1102	Essentials of Marketing
OPMT	1110	Business Mathematics
TDMT	1101	Geography of Trading
TDMT	1150	Distribution 1 (CITT)

Level 2

BLAW	3410	Business and International Law
COMM	2200	Business Communication
ECON	2200	Macroeconomics
FMGT	2100	Accounting 2
MKTG	2243	Sales Skills
OPMT	1121	Business Statistics
OPMT	1148	Industrial Engineering
OPMT	1209	Computer Applications
TDMT	2203	Transportation Economics
TDMT	2250	Distribution 1 (CITT)

Level 3

FMGT	3550	Business Finance
MKTG	2309	Marketing Research I
OPMT	3301	Quantitative Methods/Computer Applications
OPMT	3350	Microcomputer Applications: Database
TDMT	3204	Integrated Purchasing
TDMT	3301	Logistics 1
TDMT	3305	International Trading
TDMT	3309	Marine Shipping and Insurance

Level 4

FMGT	4550	Management Accounting/International Finance
HRMG	3050	Management Workshop
OPMT	1403	Warehousing
OPMT	1445	Quality Assurance Services
TDMT	1409	Harmonized Systems FTA
TDMT	2403	Quantitative Methods
TDMT	4306	Transportation Marketing
TDMT	4401	Logistics 2
TDMT	4402	Introduction to Projects
TDMT	4411	Industry Project

Note: The program is continuously evolving and therefore may not be exactly as shown.

Course Descriptions

BLAW 3410 (ADMN 384) Business and International Law—An overview of the central legal issues which arise when conducting business across international boundaries. International sale of goods contracts and international arbitration are two of the topics covered. A basic understanding of the Canadian legal system, contracts, torts, sale of goods and consumer protection is provided.

BUSA 1100 (ADMN 102) Management—A study of the management functions of planning, organizing, staffing and controlling. Included are such topics as forms of business ownership, tactical and strategic planning, decision-making, structuring the organization, providing human resources, and controlling operations. Students are given the opportunity to develop analytical and communication skills by analyzing and presenting solutions to typical business problems.

COMM 1100 (BCOM 100) Business Communication—Communicating on the job is a complex process which includes gathering and evaluating data, collaborating with co-workers, reporting to superiors, and presenting information and ideas. This introductory business course is designed to give students basic listening, writing and speaking skills which will allow them to prepare written and oral reports for BCIT courses and to proceed to more advanced communication courses.

COMM 2200 (BCOM 200) Business Communication—This course gives further instruction and practice in the principles taught in COMM 1100. It 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 processing. Prerequisite: COMM 1100.

COMP 1104 (COMP 108) Introduction to Computing—Lectures and practical exercises are used to present topics on computer terminology, hardware, software, DOS (Disc Operating System), a word processing package and spreadsheets.

ECON 2100 (ADMN 100) Microeconomics—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.

ECON 2200 (ADMN 200) Macroeconomics—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.

FMGT 1101 (FMGT 101) Accounting Basics 1—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 2201 (FMGT 201) Accounting 2—The follow-up to FMGT 1101. Topics include notes and accounts receivable, long-lived assets, liabilities, partnerships and corporations, cash-flow, manufacturing accounting, management accounting, consolidated statements and analysis of financial statements. Prerequisite: FMGT 1101.

FMGT 3550/4550 (FMGT 342/442) Busines Finance/Management Accounting International 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 engaged in international trade. Prerequisite: FMGT 1101, 2201.

HRMG 3050 (ADMN 347) Management Workshop—Using the workshop approach, day-to-day management issues are explored. Specific topics include organizational behavior, industrial relations, interviewing skills, job evaluation and the introduction of change.

MKTG 1102 (MKTG 102) Essentials of Marketing—An introductory course designed to provide the student with an overview of the marketing concept and how it can be applied to any type of organization or service. Material includes the controllable and uncontrollable elements of marketing, strategy planning, market characteristics, marketing research techniques, market segmentation and target market selection.

MKTG 2243 (MKTG 243) Sales Skills—A course designed to cover the mechanics of salesmanship and the salespersons role in the firm.

MKTG 2309 Marketing Research 1—Examines the basic approaches to marketing research and relates those 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 1102.

OPMT 1110 (OPMT 110) Business Mathematics—The course begins with basic mathematics applicable to business and industry. It then covers mathematics of finance including retail operations, simple and compound interest, discounts, annuities, financial papers and depreciation methods. Emphasis is on practical applications.

OPMT 1121 (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 1148 (OPMT 148) Industrial Engineering—Competitiveness and continuous productivity improvement are vital to all segments of industry. This is especially true in the highly competitive world of international trade and in the provision of logistics services. Through lectures, site visits, discussion and media articles, information and techniques to ensure organizational effectiveness are explored. Students will learn some of the techniques used by highly productive and competitive companies.

OPMT 1209 (OPMT 209) Microcomputer Applications 2—The course begins with a brief review of the introductory DOS and Lotus concepts presented in COMP 1104. Then, the student will be introduced to more advanced Lotus commands and applications (larger and more professional worksheets, built-in functions, graphics, database, macros, transferring data to word processing documents). Some time will be devoted to advanced DOS topics (editing text files, creating batch files, etc.). Prerequisite: COMP 1104, OPMT 1110.

OPMT 1403 (OPMT 403) Warehousing—This course is intended to provide the student with a fundamental knowledge of warehousing which is an integral part of business logistics. The course covers such topics as labour productivity, storage/handling cost determination, inventory management, types of replenishment systems, distribution requirements planning (DRP), material handling equipment and warehouse layout.

OPMT 1445 (OPMT 445) Quality Assurance Services—The course begins with an overview of quality assurance principles applicable to manufacturing and shows the development of similar concepts for the service industries. The emphasis is then placed on quality management of various aspects of transportation and logistics as a key service industry. Topics include: quality assurance fundamentals for service industries, quality control planning and activities for operating equipment (trucks, aircraft); quality maintenance of goods in transit; QA support or purchasing and the evaluation of suppliers; service quality at distribution centres; quality management and transportation aspects of overseas procurement. The topics will be covered by class discussion, lecture, video and student presentations.

OPMT 3301 (OPMT 301) Quantitative Methods—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. 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 on interpretation of results and preparation of management oriented reports.

OPMT 3350 (OPMT 350) Microcomputer Applications: Database—An examination of the need for automating an information storage and retrieval system. A case study is analyzed and a menu-driven system is developed using a standard relational database package. Topics include database creation, editing, querying; building custom reports, custom screens and labels; indexing, building multiple file relations; fundamentals of structured programming. Prerequisite: OPMT 2209.

TDMT 1101 (TDMT 101) Geography of Trading—Transportation is the basis of all economic systems including agricultural production and industrial location. 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 1150 (TDMT 150) Distribution 1 (CITT)—Provides the student with a complete overview of Canadian transportation regulations and modes including water, rail, highway, air and pipelines; intermediate transportation agencies; domestic and international transport rates, tolls and tariffs.

TDMT 1409 (TDMT 409) Harmonized Systems FTA—Introduces students to the harmonized system of exporting/importing. The EEC, USA, and most OECD countries use the same documentation and valuation system for customs purposes. The course also familiarizes students with Canada—USA Free Trade Agreement (FTA) regulations.

TDMT 2203 (TDMT 203) Transportation Economics—Covers a variety of transportation services and 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 2250 (TDMT 250) Distribution 2 (CITT)—Provides students with an overview of contracts; principles of marine insurance on cargo; warehousing; Canada Customs; damage prevention and claims; hazardous materials, materials handling; unitization devices; physical distribution; computer applications for transportation industries. Prerequisite: TDMT 1150.

TDMT 2403 (TDMT 403) Quantitative Methods—Applies a practical, quantitative approach to solving transportation logistics problems. Topics include forecasting, scheduling, transportation models and queuing theory.

TDMT 3204 (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 and 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 3301/4401 (TDMT 301/401) Logistics—An overview of the total distribution concept. Adding to previous 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 transportation, customer service and complete distribution audits. Prerequisite: TDMT 3204.

TDMT 3305 (TDMT 305) International Trading Strategies—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 advantages and disadvantages 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: TDMT 2250, MKTG 2243.

TDMT 4306 (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 analyze the

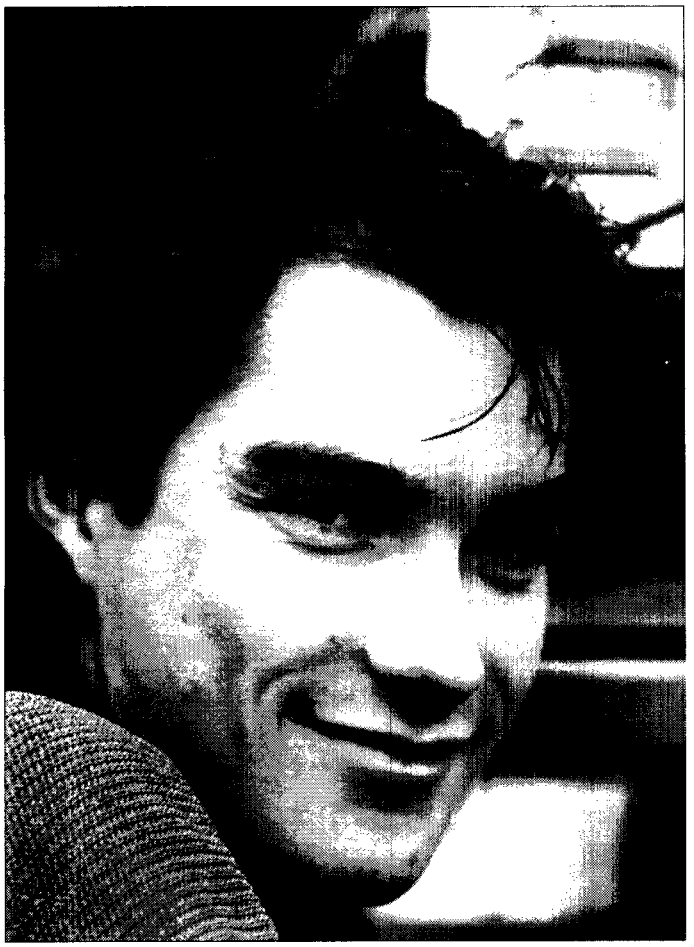
competitive position of the carrier (employer), with emphasis on the current deregulated and competitive environment.

TDMT 4402 (TDMT 402) Introduction to Projects—In preparation for their fourth term projects (TDMT 4411) students are required to conduct a management level project, on campus, within BCIT. Students are required to demonstrate learned skills within set Terms of Reference that are mutually developed between the students and BCIT staff. Prerequisite: Successful completion of all Level 1, 2 and 3 courses.

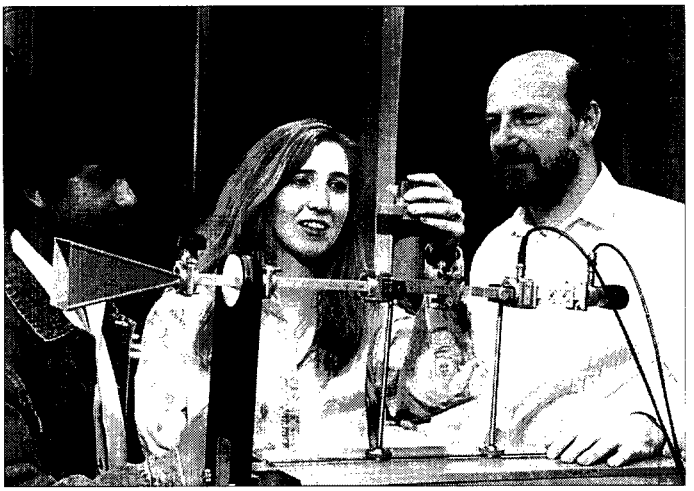
TDMT 4411 (TDMT 411) Industry Project—The course is an opportunity to apply the knowledge from the program to a specific industry project for a sponsoring company. Prerequisite: Successful completion of all Level 1, 2, 3 and 4A courses.

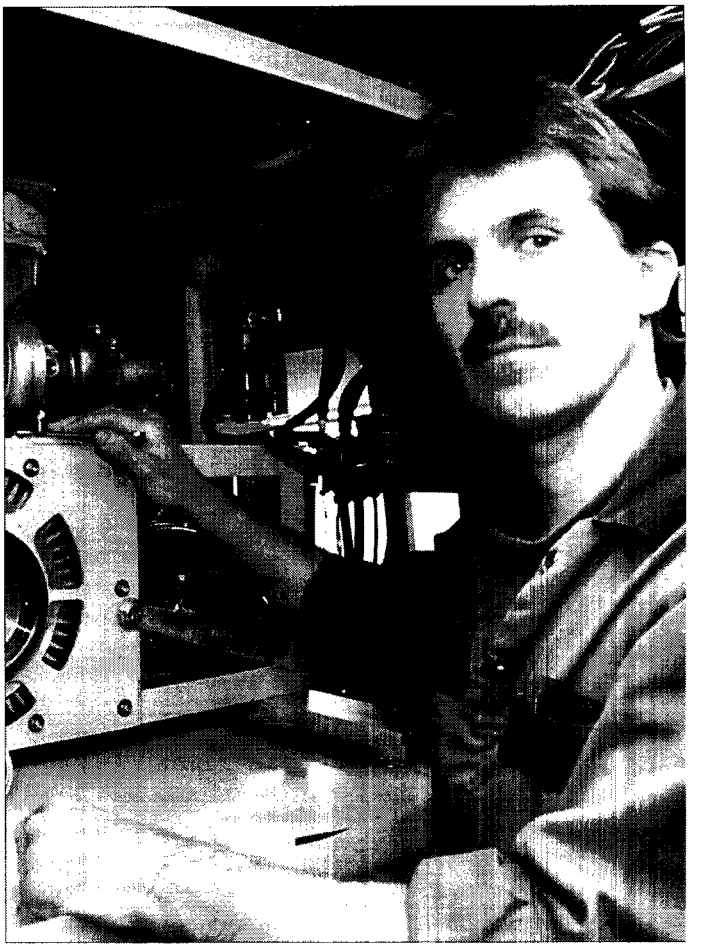
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W.J. Sheriff, B.A., B.Sc.
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W. Ratzburg, B.Sc., Dip Ed., M.B.A.
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QUICKSCAN





SCHOOL OF ELECTRICAL & ELECTRONIC TECHNOLOGY

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84/ ADMINISTRATION
Office of the Dean
Electrical/Electronic Trades
Electronics Engineering Technology

84/ ELECTRICAL/ELECTRONIC TRADES
Automated Business Equipment Technician
Electrical Control Service Technician
Electricity and Industrial Electronics
Electronics Technician Common Core Program
Industrial Instrumentation Service Technician
Security Alarm Installer
Telecommunications Technician

87/ ELECTRONICS ENGINEERING TECHNOLOGY
Computer Control Technology
Electrical Power Technology
Automation and Instrumentation Technology
Telecommunications Technology

SCHOOL OF ELECTRICAL AND ELECTRONIC TECHNOLOGY

INTRODUCTION

The electrical and electronic industry is one of the fastest growing and most exciting areas of economic development in the province of British Columbia. BCIT has responded to the challenge of rapidly changing technology by forming a separate school dedicated to this industry. This dedication assures the student of the very best training and education using curriculum that has been developed in consultation with a wide variety of managers, technicians, technologists and engineers from industry.

The School of Electrical and Electronic Technology provides an extensive and coordinated set of training and educational programs specifically designed for job entry and career advancement in the electrical and electronic fields. These programs include: electrical entry level and apprenticeship; electronics technician and related specialties; and, the electronics program for engineering technologists.

ADMINISTRATION

Office of the Dean

Dennis C. Duffey, Dean
Holly Stanley, Administrative Officer

Electrical/Electronic Trades

Dennis C. Duffey, Associate Dean
Automated Business Equipment Technician
Electricity and Industrial Electronics
Electronics Technician Common Core Program
Security Alarm Installer
Telecommunications Technician

Electronics Engineering Technology

Mike Jervis, B.Sc., Associate Dean
Computer Control Technology
Electrical Power Technology
Automation and Instrumentation Technology
Telecommunications Technology

Electrical/Electronic Trades

AUTOMATED BUSINESS EQUIPMENT TECHNICIAN

Diploma Program

This program covers a variety of modern electronic and microprocessor-controlled business equipment including facsimile machines, photocopiers, many types of printers, word and information processing systems, computer networks, desktop publishing systems and other microprocessor-controlled office equipment.

Graduates will be able to install, maintain and repair business equipment as well as employ troubleshooting techniques and preventive maintenance procedures. They will be familiar with equipment operations from a technical and a user point of view and able to deal with customers in a professional manner.

Job Opportunities

Graduates will be ready for entry into the dynamic market of electronic business equipment. Challenging career opportunities with firms dealing with modern business equipment and systems exist throughout the country in this rapidly expanding field of technology.

The Program

The program is conducted using up-to-date equipment and methods/procedures currently accepted as industry standard. The use of standard tools and test equipment for both field and depot activities will always be part of shop practical exercises.

Customer relations, appropriate dress, office routines and courtesies are all stressed to prepare graduates for entry into this field of business.

Applicants should possess good health and physical condition necessary to meet the demands of the work; good hearing, eyesight and hand/eye coordination.

This program has a dress code consistent with those found in industry.

Program Content

TELX	2200	Microprocessors
TELX	2202	Basic Xerography
TELX	2204	Copier Systems 1
TELX	2206	Communications
TELX	2208	Software Applications 1
TELX	2210	Customer Relations 1
TELX	2212	Shop Skills and Safety 1
TELX	3300	Microcomputer Systems
TELX	3302	Copier Systems 2
TELX	3304	Software Applications 2
TELX	3306	Customer Relations 2
TELX	3308	Shop Skills and Safety 2
TELX	3310	Printers

Prerequisite

Successful completion of the Provincial Electronics Technician Common Core program.

Length of Program

40 weeks full-time beginning in September each year.

Normal Course Hours

0800-1500, Monday through Friday.

Total Fees (subject to change—may not include book or equipment costs)

$1,160 for the 40-week program (1993/94).

Instructors

Len Worley
Sherry McCarnan

ELECTRICAL CONTROL SERVICE TECHNICIAN

Diploma Program

This program will provide the graduate with the theory and practical skills necessary to enter the service and maintenance sector of the electrical trade. The electrical service technician tests, repairs and maintains electrical control equipment and systems in commercial and industrial applications.

Job Opportunities

The electrical trade is being heavily impacted by high technology electronic equipment and devices. Challenging career opportunities are increasing for electrical workers who possess higher levels of training in electronics. Graduates may enter an electrical apprenticeship upon completion of the program, with opportunities available in the service and maintenance sector.

The Program

The Electrical Control Service Technician program emphasizes a hands-on approach to training where experience gained in the workshop is focused on industry practice. The theoretical component is integrated into the program to complement and enhance the

practical work. Industry tours will expose the student to a variety of work environments.

The program is divided into two levels. A passing grade is required in each course and, as the content of the courses is sequential, a student who fails a course will not be permitted to continue in the program.

Applicants should possess good health and physical condition necessary to meet the demand of the work; good hearing, eyesight, and hand/eye coordination. Potential students with medical or physical difficulties should contact Student Services to arrange an interview (telephone interview if out of town) with the Institute's Special Needs Counsellor, (604) 434-3304.

Program Content

Level 1

Principles and Applications of Magnetism; DC Machines; AC Circuit Analysis; AC Applications; Motor Control; Canadian Electrical Code.

Level 2

DC Adjustable Speed Drives; AC Variable Frequency Drives; Electrical Mechanical Interface; Programmable Controllers.

Prerequisites

Grade 12 graduation with C or better in Math 11; Math 12 preferred. Graduation from a provincially approved Electronics Common Core program.

Length of Program

40 weeks.

Normal Course Hours

0800-1500 hours, Monday to Friday.

Total Fees (subject to change—may not include book or equipment costs)

$1,160 for the 40-week program plus a $75 shop/lab fee.

Instructor

TBA

Mike Wanstall, P.Eng., Chief Instructor

ELECTRICITY AND INDUSTRIAL ELECTRONICS

Certificate Program

This program will provide the graduate with the theory and practical skills necessary to enter the electrical trade. The electrical worker plans, assembles, installs, tests, repairs and maintains electrical equipment and systems in commercial, industrial and marine facilities.

Job Opportunities

Graduates may qualify for advanced standing as indentured candidates within the apprenticeship system.

Job opportunities exist in the construction, mining, forestry, food production, manufacturing, grain handling, transportation, utility and service industries. The nature of the electrical trade has changed with the impact of solid state control and programmable logic controllers. Challenging career opportunities are available to the person who is prepared to acquire a broad range of technical skills.

The Program

The Electricity and Industrial Electronics Program emphasizes a hands-on approach to training where experience gained in the workshop is focused on industry practice. The necessary theoretical component is integrated into the program to complement and enhance the practical work. Industry tours will expose the student to a variety of work environments.

The program is divided into two levels. A passing grade is required in each Level 1 course to progress into Level 2. Evaluation is based on both classroom theory and shop performance.

Applicants should possess good health and physical condition necessary to meet the demands of the work: good hearing, eyesight and hand/eye coordination. Potential students with medical or physical difficulties should contact Student Services to arrange an interview (telephone interview if out of town) with the Institute's Special Needs Counsellor, (604) 434-3304.

Program Content

Level 1

TELX	1120	Electrical Math
TELX	1121	Trade Science
TELX	1122	Fundamentals of Electricity
TELX	1123	Wiring Methods
TELX	1124	Blueprints, Plans and Specifications
TELX	1125	Canadian Electrical Code

Level 2

TELX	2220	Principles and Applications of Magnetism
TELX	2221	AC Circuit Analysis
TELX	2222	AC Applications
TELX	2223	Motor Control and Industrial Wiring
TELX	2224	Electronics
TELX	2225	Computer Skills and Job Preparation

Program Length

40 weeks full-time beginning several times a year.

Program Locations

This program is available at the BCIT Burnaby campus and in Langley. Applicants must specify location preference when applying.

Normal Course Hours

0800-1500, Monday through Friday.

Total Fees (subject to change may not include book or equipment costs)

$1,398 for the 40-week program (1993/94).

Prerequisites

a. High School graduation with C or better in Math 11 (Algebra);

or

b. Pass an entrance test measuring math and reading skills.

BCIT presently has agreements with a number of School Districts throughout the province which give special status to Career Preparation graduates. A limited number of seats are available for Career Preparation graduates entering directly from secondary school. To gain preferential entry, students must meet the above prerequisites, complete a related Career Preparation Program, and have good grades in Electricity/Electronics and/or Math 11. For additional information see your high school counsellor, Technical Education teacher, or call BCIT Student Services at 434-3304, or 1-800-667-0676 for enquiries from outside the Greater Vancouver Area.

Instructors

M. Wanstall, P.Eng., Chief Instructor
G. Denham
A. Dutta
J. Jordan
O. Wetzlmayr

ELECTRONICS TECHNICIAN COMMON CORE PROGRAM

Certificate Program

Electronics training will provide graduates with the skills to install, maintain and repair electronic circuits and equipment. Through a series of experiments, students will learn the correct use of tools, test equipment, troubleshooting procedures and soldering techniques, as well as verifying the theoretical aspects of electronics.

Job Opportunities

Students who successfully complete this program have the option of either progressing into one of the specialty technician programs at BCIT or transferring to another college offering specialty options or entering the electronics industry at an entry level position such as installer, assembler or quality control technician.

Program Content

TELX	1101	Electronics Technical Skills 1
TELX	1102	DC Circuit Analysis
TELX	1103	AC Circuit Analysis
TELX	1104	Electronics Troubleshooting 1
TELX	1110	Solid State Devices—Discrete
TELX	1111	Solid State Devices—Integrated
TELX	1112	Electronics Troubleshooting 2
TELX	1130	Electronics Technical Skills 2
TELX	1131	Digital Principles
TELX	1132	Microprocessor Principles
TELX	1133	Electronics Troubleshooting 3

Program Length
Two versions of the program are offered: 30 weeks full-time consisting of 2, 15-week terms beginning several times a year; and part-time evening basis, three nights a week, 3 1/2 hours per night over two years.

Program Locations
BCIT Burnaby and Langley.

Program Preference
Applicants must specify the preferred location and program format (full-time or part-time) when applying for this program.

Normal Course Hours
0800-1500, Monday through Friday, full-time format.
1830-2200, Tuesday, Wednesday and Thursday, part-time format.

Total Fees (subject to change—may not include book or equipment costs)
$945 for the 30-week full-time program (1993/94).
Check our flyers for part-time course fees.
$586 per year for the two-year, part-time evening program (1993/94).

Prerequisites
High School graduation with Math 11 with C or better; Math 12 preferred.

Transferability
This program comes under the guidelines of the Provincial Government's Common Core Electronics Technician Program. As such, students who successfully complete the Common Core Program will be able to transfer to other provincial institutions or colleges offering specialties not offered at BCIT.

Laddering: Specialty Programs Currently Offered at BCIT
These are available to students who have successfully completed the Electronics Technician Common Core Program or equivalent.

Avionics Technician (AME category 'E').
Please refer to page 190.
Automated Business Equipment Technician
Telecommunications Technician

BCIT presently has agreements with a number of School Districts throughout the province which give special status to Career Preparation graduates. A limited number of seats are available for Career Preparation graduates entering directly from secondary school. To gain preferential entry, students must meet the above prerequisites, complete a related Career Preparation Program, and have good grades in Electricity/Electronics and/or Math 11. For additional information see your high school counsellor, Technical Education teacher, or call BCIT Student Services at 434-3304, or 1-800-667-0676 for enquiries from outside the Greater Vancouver Area.

Instructors
Patrick Mulldoon, Chief Instructor
Lance McCollum
Miro Angeles
Ed Bosman
Canede Wong
Gabriel Yam
Emile Gaudet

INDUSTRIAL INSTRUMENTATION SERVICE TECHNICIAN

Diploma Program

This program covers the application, installation and servicing of measurement and control instrumentation applied to industrial processes. The program concludes with the programming and application of industrial distributed control systems (DC's) and programmable logic controllers (PLC's).

Job Opportunities
Graduates will be trained to install, calibrate and maintain pneumatic, electronic and computer-based industrial process measuring instruments, controllers and final control elements.

This program will open new career opportunities for electronics core graduates, as well as addressing the requirements of the industrial instrumentation industry for skilled and qualified technicians. Graduates will be ready for employment in the food processing, pulp and paper, oil, mining, manufacturing and heating/ventilating industries. Graduates could also meet the needs of instrument service and sales companies.

The Program
The program is conducted in a realistic environment using industrial pilot plants which contain distillation, evaporation, effluent treatment, pulp blending, chemical reaction, pulp digester and industrial boiler processes. Students will install, calibrate and tune measurement and control instruments applied to the above processes.

Applicants should possess good health and physical condition necessary to meet the demands of the work; good hearing, eyesight and hand/eye coordination.

Prerequisite
Grade 12 graduation with a C or better in Math 11; Math 12 preferred. Graduation of a provincially approved Electronics Common Core program.

Length of Program
40 weeks.

Normal Course Hours
0800-1500 hours, Monday to Friday

Total Fees (subject to change—may not include book or equipment costs)
$1,160 for the 40-week program plus a $75 shop/lab fee.

Instructor
TBA
Jim Armstrong, Chief Instructor

SECURITY ALARM INSTALLER

Certificate Program

The need for security in our society is increasing and the demand for qualified Security Alarm Installers is already at the critical stage. The Security Alarm Installer training program is the first full-time program of its kind in North America, and provides the training needed for graduates to excel in this growing industry.

Job Opportunities
Security is needed practically everywhere and at a growing rate—in large industrial plants, office buildings, large and small businesses, apartment buildings and private homes. You will be able to design, install and service alarm systems, central station monitoring equipment, access control systems and closed circuit television systems.

After you have completed the Security Alarm Installer program and have worked for 18 months with a licensed Security Alarm Company, you will be eligible to take the Security Alarm Installers' Tradesman Qualification Exam.

The Program
The program begins with an introduction to the principles of electricity and electronics, and progresses into building design, wiring methods, print interpretation and codes. Once

the basics are covered, students progress to study advanced alarm systems and troubleshooting techniques. During this section of the program there are up to two weeks of job experience with a licensed security company. The final segment of the program involves design and communication techniques where students learn how to address clients' needs, handle central station documentation, and conduct surveys of premises.

Potential students with medical or physical difficulties should contact Student Services to arrange an interview (telephone interview if out of town) with the Institute's Special Needs Counsellor, (604) 434-3304.

Program Content

TELC	1100	Fundamentals of Electricity
TELC	1101	Fundamentals of Electronics
TELC	2200	Building Construction and Code
TELC	2203	Detection Circuits and Devices
TELC	3300	Alarm Control Panels
TELC	3301	Central Station Communication
TELC	3302	Advanced Security Systems

Program Length
20 weeks full-time beginning in March and September each year.

Normal Course Hours
0800-1500, Monday through Friday.

Total Fees (subject to change—may not include book or equipment costs)
$580 for the 20-week program (1993/94).

Prerequisites
a. High School graduation or equivalent. Preference will be given to applicants with a C or better in Math 11, or pretest, and
b. Security clearance from the office of the B.C. Solicitor General will be required prior to final acceptance.

BCIT presently has agreements with a number of School Districts throughout the province which give special status to Career Preparation graduates. A limited number of seats are available for Career Preparation graduates entering directly from secondary school. To gain preferential entry, students must meet the above prerequisites, complete a related Career Preparation Program, and have good grades in Electricity/Electronics and/or Math 11. For additional information see your high school counsellor, Technical Education teacher, or call BCIT Student Services at 434-3304, or 1-800-667-0676 for enquiries from outside the Greater Vancouver Area.

Instructors
M. Zecchel
M. Wanstall, P. Eng., Chief Instructor

TELECOMMUNICATIONS TECHNICIAN

Diploma Program

This program builds on the foundation of generic technical skills developed in the Electronics Technician Common Core Program.

Focusing on the installation, maintenance and repair of telecommunications equipment, the student is prepared to work in a variety of roles in this field. The program emphasizes hands-on practical training on equipment typically encountered in industry.

Job Opportunities
Graduates are employed in all aspects of the telecommunications industry including telephone companies, telecommunications equipment manufacturers, utility companies, cable and satellite entertainment and communications companies, data communications companies, fibre-optic companies and government departments.

Program Content

TELX	2201	Telecommunications Principles
TELX	2203	Telecommunications Technical Skills
TELX	2205	High Resolution Soldering and Circuit Boards
TELX	2207	Data and Voice Cabling
TELX	2209	Fibre Optics
TELX	3301	Telecommunications Test Equipment
TELX	3303	Radio Communications
TELX	3305	Antennae and Transmission Lines
TELX	3307	Telephone Communications
TELX	3309	Data Communications
TELX	4401	Microwave Systems
TELX	4403	Multiplex Systems
TELX	4405	Radio and Television Broadcast Systems
TELX	4409	Cable Distribution Systems
TELX	4411	Satellite Nav/Com Systems

Program Length
40 weeks full-time beginning September each year.

Normal Course Hours
0800-1500, Monday through Friday.

Total Fees (subject to change—may not include book or equipment costs)
$1,160 for the 40-week program (1993/94).

Prerequisites
Successful completion of the Electronics Technician Common Core Program or equivalent plus Math 11 with C; Math 12 preferred.

Instructor
Terry Knudson

Electronics Engineering Technology

ELECTRONICS ENGINEERING TECHNOLOGY

Diploma Programs

Computer Control Technology
Electrical Power Technology
Automation and Instrumentation Technology
Telecommunications Technology

Job Opportunities
There is a need for people trained in the principles and applications of electronics to take their places on the technical team. The positions held by these persons include design, development, production, installation, sales and technical support. The positions may be as design assistant with engineering consulting firms such as H.A. Simons or Fransen Engineering; designers with factory and mill automation control equipment with companies such as Kita Engineering; process automation and DCS systems hardware and software support with companies such as Norpac Controls; distribution designers or protection and control technologists with utilities such as BC Hydro; electronics technologists and designers with high tech companies such as Nexus Engineering, Epic Data, and Dynapro Systems; electronics communication specialists with government agencies such as the RCMP, B.C.Tel, and the Dept. of Communications; sales and field engineering representatives for companies such as ASEA, General Electric or Westinghouse; or as part of the teaching team in educational institutions.

Microcomputers, electrical power transmission and distribution, 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, electrical power utilities, the industrial process, rapid transit systems, the office, the small business, the hospital and the home.

The Technologist graduate of the Electronics Technology program is an essential member of many high tech teams.

The Diploma of Technology

The Electronics Engineering Technology program is nationally accredited by the Applied Science Technologists and Technicians of British Columbia. Electronics Engineering Technology offers students the flexibility of an equal-term, multiple-intake system, with course-by-course registration, and the option of enroling in two terms of academic study per year, starting each September and January. All terms run concurrently, thus a student can start a program in September or in January. It takes four terms of academic study to reach graduation, thus a student who starts a program in September of one year can graduate 21 months later. A student who enrols in the Coop program would take longer. Although students are encouraged to take six courses per term, as listed below, course-by-course registration makes it possible for students with special needs to carry a reduced course load; they would of course then take longer to reach graduation.

Cooperative Education

Cooperative Education, providing paid work experience, can be an integral part of the Electronics Engineering Technology programs. Students who successfully complete a minimum of two and a maximum of three work periods receive a Cooperative Education Endorsement on their Diplomas of Technology. The paid work periods with an employer in the Electronics industry are of three or four months duration and are interleaved between terms of academic study after Term 2. The industrial experience gained in the Coop component of the program makes a student more immediately valuable to prospective employers. See page 14 for a full description of the Cooperative Education program.

The Programs

Four programs are offered in the Technology: Computer Control, Electrical Power, Automation and Instrumentation, and Telecommunications. The first two levels of the technology program are common to all four options. Levels 3 and 4 for all four programs are oriented towards current industrial practices. Throughout Levels 3 and 4, students spend a good portion of their time in laboratories and workshops carrying out practical, applied assignments.

The Computer Control Technology presents a broad-based electronics program with special emphasis on the hardware and software of computer-based control and data acquisition systems. It is designed to provide the necessary background for entry into a wide variety of areas in the electronics industry. The main topics are: hardware and software (assembly language and high level language) design for microcontroller and PC-based systems, digital and analog electronics, applications software (CAD, PC layout, logic simulation), electro-mechanical devices, industrial electronics, digital communications, industrial video applications, and programmable logic devices. All stages of product development (design, manufacture, fault finding and testing) are emphasized throughout the program. A technical project is performed in Levels 3 and 4. *For further information please contact Ron Jones at 432-8263. Offered January—May and September—January.

The Electrical Power Technology. Students enter the program in the 4th term after having completed the 3rd term of the Computer Control Technology or after graduation from any other program. This final term is concentrated in five main areas: programmable controllers (PLC's), electrical equipment, utility power systems, industrial power systems and industrial electronics. From the basic three-phase power and machine theory learned in Term 3, students advance to the theory and practice of power system analysis and protective relaying. From the electronics theory learned in Term 3, students advance to switching power supplies, thyristor AC and DC power control and on to variable frequency supplies. Students will apply feedback theory in the design of voltage and motor speed control systems. The Electrical Power Option is offered in the January to May term only.

The Automation and Instrumentation Technology 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 practical application of modern measurement and control strategies to a wide range of manufacturing and processing industries. Programmable logic controllers (PLC's), microprocessor-based configurable controllers, distributed control systems (DCS) and the application of each are included in this study of current automation technology. Offered January-May and September-January.

The Telecommunications Technology prepares the student for a career as a technologist in the telecommunications industry. Building on the knowledge and skills gained in Terms 1 and 2, it covers the principles of telecommunications and from these principles develops complete telecommunications systems. These systems vary all the way from broadcast entertainment radio and TV, through marine and land mobile radio, to high-density long-haul microwave radio systems. Also included are fibre optic links, digital data transmission systems, satellite communication systems, radio-navigational aids, and digital and computer control of communications equipment and systems. Offered January—May and September to January.

Degree Transfer/Completion

There are bridging programs from BCIT to Lakehead University and the University of Victoria, allowing graduate students to complete an accredited Electrical Engineering Degree. Transfer credits to other universities are possible on an individual basis.

Prerequisites

High school graduation with Math 12 or (pre 1990) Algebra 12 with C+; English 12 with C; Physics 11 with C+ **or** Physics 12 Pass, where Physics 12 is preferred; **or** Engineering Technology Entry Program (6 months). The prerequisites for entry into individual courses are listed with the course descriptions. In addition to these, the student must have completed COMM 1143 before entering any Level 3 or Level 4 course, or before entering the Co-op program.

Technology: ELECTRONICS

Level 1			Clrm hrs/wk		Credits
COMM	1143	Technical Writing for Electronics	3.0		3.5
ELEX	1105	Circuit Analysis 1	6.0		7.0
ELEX	1110	Electronic Manufacturing Processes	5.0		5.5
ELEX	1115	Digital Techniques 1	5.0		5.5
MATH	1431	Basic Technical Mathematics for Electronics	7.0		8.0
PHYS	1143	Physics for Electronics 1	6.0		7.0
		Library, Research, Evaluation	3.0		0.0
Level 2					
ELEX	2105	Circuit Analysis 2	5.0		5.5
ELEX	2115	Digital Techniques 2	6.0		7.0
ELEX	2120	Electronic Circuits 1	7.0		8.0
ELEX	2125	C Programming	4.0		4.5
MATH	2431	Calculus for Electronics	6.0		7.0
PHYS	2143	Physics for Electronics 2	4.0		4.5
		Library, Research, Evaluation	3.0		
Co-op 1					
ELEX	2990	Co-op 1	0.0		15.0

Programs: COMPUTER CONTROL TECHNOLOGY AND ELECTRICAL POWER TECHNOLOGY

Level 3			3A	3B	
ELEX	3305	Microcontroller Systems 1	6.0	6.0	7.0
ELEX	3310	Pulse Techniques	5.0	5.0	5.5
ELEX	3315	Applications Software	5.0	5.0	6.0
ELEX	3320	Electronic Circuits 2	6.0	6.0	7.0
ELEX	3325	Electrical Equipment	5.0	5.0	6.0
MATH	3431	Transform Calculus Electronics	—	4.0	3.0
OPMT	1141	Total Quality Management	4.0	—	3.0
		Library and Research	4.0	4.0	0.0

COMPUTER CONTROL TECHNOLOGY

Level 4			4A	4B	
COMM	2443	Technical Writing For Electronics	3.0	3.0	3.5
ELEX	4305	Programmable Logic Devices	4.0	—	2.0
ELEX	4315	Applied Electronic Circuits	7.0	5.0	7.0
ELEX	4320	Industrial Electronics and PLC's	7.0	7.0	8.0
ELEX	4325	Microcontroller Systems 2	6.0	6.0	7.0
ELEX	4330	Technical Project (Control)	—	4.0	2.5
ELEX	4510	Data Communication	6.0	6.0	7.0
		Library and Research	2.0	4.0	0.0

ELECTRICAL POWER TECHNOLOGY

Level 4			4A	4B	
COMM	2443	Technical Writing for Electronics	3.0	3.0	3.5
ELEX	4320	Industrial Electronics and PLC's 7.0	7.0	8.0	
ELEX	4405	Industrial Systems	8.0	6.0	8.0
ELEX	4410	Power Systems	7.0	6.0	7.5
ELEX	4415	Electrical Equipment and PLC's	8.0	8.0	9.0
ELEX	4430	Technical Project (Power)	—	4.0	2.5
		Library and Research	—	1.0	0.0

Program: AUTOMATION AND INSTRUMENTATION TECHNOLOGY

Level 3			Clrm hrs/wk 3A	3B	Credits
CHEM	3302	Electronic Sensors for Analytical Measurements	4.0	4.0	5.0
CHSC	3343	Thermodynamics and Fluid Mechanics	4.0	—	2.0
ELEX	3205	Data Acquisition/ Signal Conditioning	6.0	6.0	7.0
ELEX	3210	Sensors for Measurement and Control	6.0	6.0	7.0
ELEX	3215	Process Control Devices/ Techniques	6.0	6.0	7.0
ELEX	3305	Microcontroller Systems 1	6.0	6.0	7.0
MATH	3431	Transform Calculus Electronics	—	4.0	3.0
		Library and Research	3.0	3.0	0.0
Level 4			**4A**	**4B**	
COMM	2443	Technical Writing for Electronics	3.0	3.0	3.5
ELEX	4205	Microprocessors for Measurement and Control	6.0	6.0	7.0
ELEX	4210	Analyzers for Process Automation	5.0	5.0	5.5
ELEX	4215	Strategies for Industrial Process Control	6.0	6.0	7.0
ELEX	4220	PLC's and Distributed Control Systems	6.0	6.0	7.0
ELEX	4225	Industrial Control Projects and Computer Aided Design (CAD)	5.0	5.0	5.5
		Library and Research	3.0	3.0	0.0

Program: TELECOMMUNICATIONS TECHNOLOGY

Level 3			3A	3B	
ELEX	**3305**	**Microcontroller Systems 1**	6.0	6.0	7.0
ELEX	3310	Pulse Techniques	5.0	5.0	5.5
ELEX	3505	Telecommunications Circuits and Systems 1	6.0	6.0	7.0
ELEX	3510	Antennas and Transmission Lines	5.0	5.0	5.5
ELEX	3515	Electronic Circuits 2 (Telecom)	5.0	5.0	5.5
MATH	3431	Transform Calculus Electronics	4.0	—	3.0
OPMT	1141	Total Quality Management	—	4.0	3.0
		Library and Research	4.0	4.0	0.0
Level 4			**4A**	**4B**	
COMM	2443	Technical Writing	3.0	3.0	3.5
ELEX	4505	Telecommunication Circuits and Systems 2	6.0	6.0	7.0
ELEX	4510	Data Communication	6.0	6.0	7.0
ELEX	4515	Switching Networks/ Fibre Optics	2.0	5.0	4.0
ELEX	4520	Microwave Principles and Systems	4.0	4.0	4.5
ELEX	4525	Radio Frequency Circuit Design	5.0	5.0	5.5
ELEX	4535	PC Software for Telecom	4.0	—	3.5
		Library and Research	5.0	6.0	0.0

CO-OP 2

(For all Programs after completion of Term 3)

ELEX	3990	Co-op 2	15.0

CO-OP 3

(For all Programs, if desired)

ELEX	4990	Co-op 3	15.0

Course Descriptions

CHEM 3302 (CHEM 302) Electronic Sensors for Analytical Measurements—Teaches the student the principles and applications of electronics and circuitry used in the process analysis of liquids and gases. Topics include electro-chemical principles and terminology, selection of transducers, electrolytic conductivity, specification 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. Prerequisite: ELEX 2105, 2120.

CHSC 3343 (CHSC 343) Thermodynamics and Fluid Mechanics—Before suitable measurement and automatic process control strategies can be designed and implemented, a detailed knowledge of the behavior of that process is required. CHSC 3343 fills that requirement by introducing the student to the static and dynamic properties of common industrial processes. Topics include transportation of fluids and fluid dynamics as well as an introduction to thermodynamics including heat transfer and energy balance equations. Prerequisite: MATH 2431, PHYS 2143.

COMM 1143 (TCOM 114) Technical Writing for Electronics—This course emphasizes clear, correct, concise technical writing in the 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.

COMM 2443 (TCOM 214) Technical Writing for Electronics—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: COMM 1143.

ELEX 1105 (ELEX 100) Circuit Analysis 1—Teaches the principles and methods of analysis related to DC circuits. Topics include SI units and terminology, voltage, current, work, energy, power and resistance. Series, parallel, and series-parallel circuits are analyzed and designed. Methods of analysis for more complex circuits include mesh, superposition, nodal, Thevenin, and Norton. Transients in RC and RL circuits are analyzed. Average and RMS values for sinewaves and rectangular waves are calculated. Labs are synchronized with lectures so that theory is studied and confirmed by application.

ELEX 1110 (ELEX 101) Electronic Manufacturing Processes—Through the design and manufacture of specific electronic projects, students learn the skills required to do basic soldering, printed circuit repair and rework, high reliability soldering, design and fabrication of single and double-sided printed circuit boards. Upon successful completion, the student will be able to demonstrate a good understanding of the components used in the manufacture of electronic equipment, chassis and metal cabinet design, electronic drafting conventions, tools and techniques used in electronic fabrication, printed circuit design and manufacturing methods, tools used for PWB repair, high reliability soldering requirements, repair of heat and mechanically damaged PC boards, as well as techniques required in the design and manufacture of single and double-sided printed circuit boards.

ELEX 1115 (ELEX 102) Digital Techniques 1—Begins with a description of the fundamental theory of the decimal and binary number systems, then examines the binary (two states or levels) concept followed by the description of binary variables as related to mechanical switches. Digital logic circuits are discussed and their truth tables and Boolean output equations are generated. Various logic sources are defined and interfaced to combinational logic circuits comprised of electronic logic gates. A TTL data book will be utilized to facilitate combinatorial logic circuit design. Boolean identities and Karnaugh mapping will be used to minimize algebraic expressions. Combinational digital logic will be designed and constructed implementing NAND and NOR GATES using their proper Demorgan's equivalent symbols (Duality of Gates). Encoders and decoders will be introduced. Upon successful completion of this course, the student will be able to correctly use the standard logic symbols and apply proper gating techniques to the analysis and construction of basic logic circuits from word problems or in the laboratory environment.

ELEX 2105 (ELEX 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, analysis of AC circuits with complex algebra; resonance and resonant circuits; highpass and lowpass filters; the application of circuit laws and theorems to single-phase AC circuits; and coupled circuits. The circuit theory is verified using multimeters, sine wave generators, and dual trace oscilloscopes. Prerequisite: ELEX 1105, MATH 1431.

ELEX 2115 (ELEX 202) Digital Techniques 2—Builds on the knowledge gained in ELEX 1115. Studies the utilization of logic gates in larger combinatorial circuits such as magnitude comparators, etc.; digital arithmetic and associated hardware; sequential logic devices such as D, J-K, and T; flip-flops, counters, shift registers and their application in systems such as frequency counters and parallel/serial data manipulation circuits; gathering and comprehension of electrical specifications from data books; noise margins; propagation delay and loading considerations; inter-facing techniques to discrete devices, analog and digital data multiplexing, bus structures and techniques. Successful completion will lead to entry in ELEX 3305. Prerequisite: ELEX 1115, PHYS 1143, COMM 1143, ELEX 2120* recommended (*may be taken concurrently).

ELEX 2120 (ELEX 203) Electronic Circuits 1—This introductory electronic circuits course provides the foundation for subsequent electronics courses in all options. Explains how electronic circuits work, how to analyze, design, modify and combine them to perform complex functions. Laboratory work emphasizes logical circuit layout and wiring and the use of common test equipment to analyze and troubleshoot electronic circuits. Prerequisite: ELEX 2105*, MATH 1431, PHYS 1143 or 1163, COMM 1143 (*may be taken concurrently).

ELEX 2125 (ELEX 205) C Programming for Electronics—An introductory course in microcomputer use, DOS operating system, programming languages, compilers and interpreters. The IBM personal computer is used throughout this course for interactive student training. The main part of the course covers C programs for engineering applications. Students will also learn to document and debug software, and to utilize available software libraries. Prerequisite: ELEX 1105* (*may be taken concurrently).

***ELEX 2990 (ELEX 390) Cooperative Education Workterm 1**—The application of theory and labs from Terms 1 and 2 to the industrial electronics setting. This is a paid position acquired through the Cooperative Education office. This position must be a minimum of 12 weeks to qualify for credit, and may be a maximum of 4 months.

ELEX 3205 (ELEX 341) Data Acquisition/Signal Conditioning—Examines the application and design of precision analog 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 with emphasis on the 2-wire current loop. A strong practical approach is

ensured by lab exercises and projects. Prere quisite: ELEX 2105, 2120, MATH 2431.

ELEX 3210 (ELEX 342) Sensors for Measurement and Control—Introduces the student to the principles and techniques used in the industrial measurement of pressure, mass, level, density, and temperature. Topics will include pressure and temperature transmitters, humidity transducers and nuclear density gauges. Labs will apply the principles of these transducers and the latest in smart transmitter technology to various industrial and commercial applications. Prerequisite: ELEX 2120, PHYS 2143, MATH 2431.

ELEX 3215 (ELEX 343) Process Control Devices/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 of electronic, pneumatic and hydraulic devices that are incorporated into transmitters, signal converters, positioners and power amplifiers; control valve specification and sizing. Lab exercises will analyze the design and performance of manufacturers' control equipment applied to steam and liquid processes. Prerequisite: ELEX 2120, 3210*, MATH 2431, PHYS 2143 (*may be taken concurrently).

ELEX 3305 (ELEX 302) Microcontroller Systems 1—Applies knowledge gained in ELEX 1115/2115 to perform a detailed study of a microcontroller system. This includes internal architecture, memory devices, machine/assembly/high level language programming, an operating system, software development tools, input and output ports, A to D and D to A converters, interrupts and the serial peripheral interface. Throughout the course, a single board microcontroller system is used to facilitate a detailed analysis of hardware and software involved. Prerequisite: ELEX 2125, or 201, or 204, 2115, 3320* or 3515*, or 3205* (*may be taken concurrently).

ELEX 3310 (ELEX 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, phase locked loops, and switching power supplies. Both discrete transistors (bipolar and FET) and CMOS integrated circuits are used in building these circuits. Each circuit is analyzed in detail and its practical application is considered. Prerequisite: ELEX 2105, 2115, 2120, MATH 2431

ELEX 3315 (ELEX 311) Applications Software—A PC-based, project-oriented, hardware/software course in two parts: the first part consists of software programming into a simple ready-made interface, using the C language to activate both digital and analog I/O. The second, major, part covers the entire process from conception and design to manufacture of a printed circuit board for use in a computer interface. The hardware is bread-boarded and tested using software; the circuit diagram is drawn using a commercial schematic capture package; the artwork produced by auto-routing, and the assembled circuit board finally tested, ready for use in lab work for ELEX 4325. Prerequisite: ELEX 1110, 2125, 2115.

ELEX 3320 (ELEX 313) Electronic Circuits 2 (Control)- A continuation of ELEX 2120. Begins with the differential amplifier and its small signal analysis and performance. This material forms an introduction to linear integrated circuits, particularly the operational amplifier and its circuit applications. These include an introduction to active filters, comparators, sine wave oscillators, simple function generators and output stages. Other topics include amplitude, phase and frequency modulation, transmission bandwidth, phase locked loops, FSK and PSK modulation. Prerequisite: ELEX 2105 or 2135, 2120, MATH 2431.

ELEX 3325 (ELEX 314) Electrical Equipment—This course introduces electrical power distribution systems and electro-mechanical devices. The topics include: single- and three-phase power distribution systems, transformers, rectification and filtering, DC motors and generators, induction motors, synchronous motors and generators, stepper motors and motor control. Prerequisite: ELEX 2105 or 2135, ELEX 2120, MATH 2431, PHYS 2143.

ELEX 3505 (ELEX 331) Telecommunications Circuits and Systems 1—The most common circuits used in transmitting and receiving apparatus will be studied by close examination of popular circuit configurations. Of special interest will be circuits used for amplitude, frequency and analog phase modulations. The make-up of an information signal will be discussed. The need for modulation and the types of modulation and their advantages will be fully studied. The principles defined within this course will apply to most communications systems regardless of transmission medium. Prerequisite: ELEX 2105 or 2135, 2115, 3515*, MATH 2431 (*may be taken concurrently).

ELEX 3510 (ELEX 332) Antennas and Transmission Lines—Examines the methods and devices used for the transmission of radio frequency energy. Topics include the characteristics and limitations of open-wire and coaxial lines; design of matching networks; waveguides; dipole antennas; loop antennas; antenna arrays; microwave antennas; propagation using ground waves, sky waves and space waves. Prerequisite: ELEX 3505*, PHYS 2143 (*may be taken concurrently).

ELEX 3515 (ELEX 333) Electronic Circuits 2 (Telecom)—Provides further knowledge of electronic circuits with emphasis on their application in telecommunications. Topics include small-signal tuned amplifiers; control of gain; stability of tuned amplifiers; wideband amplifiers; differential amplifiers; operational amplifiers; active filters; parameter systems and their use in small-signal analysis. A series of lab exercises serves to confirm lecture theory, and to develop practical hands-on skills in the use of relevant test instruments. Prerequisite: ELEX 2105 or 2135, 2120, MATH 2431.

***ELEX 3990 (ELEX 490) Cooperative Education Workterm 2**—The continuation of work experience in a paid position within industry/business, acquired through the Cooperative Education office (minimum 12 weeks, maximum 4 months duration). The combination of successful completion of ELEX 390 and ELEX 490 will add the notation COOPERATIVE EDUCATION to the Diploma of Technology offered by the Electronics Technology.

ELEX 4205 (ELEX 441) Microprocessors for Measurement and Control -Investigates applications 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. The lab component will provide practical experience in microprocessor circuit design, interfacing of analog and digital I/O and software design. Prerequisite: ELEX 3305 and 3205.

ELEX 4210 (ELEX 442) Analyzers for Process Automation—This course covers a number of techniques used in the area of industrial process measurement applications. Flow measuring devices such as head devices, turbine and magnetic flowmeters are investigated. Analytical techniques to measure gas composition (including zirconium oxide oxygen analysis and gas chromatography), Ph and conductivity are investigated. Techniques to measure pressure and mass using strain gauges are discussed. In the lab, students will analyze and calibrate typical industrial measuring devices. Prerequisite: ELEX 3210, CHEM 3302.

ELEX 4215 (ELEX 443) Strategies for Industrial Process Control—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 heat exchangers, boiler systems, evaporators, distillation columns and Ph systems. These processes will be used to demonstrate the application of the most common multiple-loop control strategies: cascade, feedforward, ratio, selective and adaptive systems. Prerequisite: ELEX 3215, 4210*, CHSC 3343 (*may be taken concurrently).

ELEX 4220 (ELEX 444) PLC's and Distributed Control Systems—Examines the application of programmable control devices to industrial automation. Interlock and sequence control systems are designed using ISA and JEDEC symbologies, and implemented using programmable logic controllers (PLC's). Microprocessor-based configurable controllers are applied and programmed for process control systems. Distributed control system architectures are examined with reference to commercially available systems. Networking standards (MAP, PROWAY, IEEE 488) and their application to plantwide automation are also examined. Project work involves the design and implementation of systems using typical industrial programmable control devices. Prerequisite: ELEX 4205*, 4215* (*may be taken concurrently).

ELEX 4225 (ELEX 445) Industrial Control Projects and Computer-Aided Design (CAD)—Examines process control system design and documentation techniques including CAD. Current ISA, SAMA and ASME symbologies are used in the preparation of control system documents such as process and instrument drawings, loop diagrams, functional diagrams and specification sheets. The role of these documents in the management of instrument projects is also examined and CAD systems are used for their preparation. Hazardous area classification and system design for hazard reduction and intrinsic safety are also examined. Project work involves all aspects of control system design from concept to evaluation. Prerequisite: ELEX 4210, 4215, 4220, COMM 2443 (all may be taken concurrently), CHSC 3343.

ELEX 4305 (ELEX 411) Programmable Logic Devices—Introduction to user programmable logic devices including PAL's, FPLA's and EPLD's. Lab work will cover basic concepts and applications using design software such as PALASM and logic simulation. Students are encouraged to incorporate PLD design into their level 4 project.Prerequisite: ELEX 3305, 3315.

ELEX 4315 (ELEX 414) Applied Electronic Circuits—Introduces practical industrial video applications 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. Data acquisition and display, image storage in RAM, alphanumeric ROM character generators and CRT controllers are all introduced in lectures and lab projects. Assembly language programming is used with the 68HC11 microcontroller to create graphic displays and to monitor and control high resolution frame storage. Prerequisite: ELEX 3305, 3320, 3310, 4325* (*may be taken concurrently).

ELEX 4320 (ELEX 415) Industrial Electronics/PLC's—The course commences with rectifier transformer RMS current and KVA requirement calculations and moves on to the design of L-C filters for single and three-phase diode and thyristor rectifier DC power supplies. Students then study the design and feedback control of series, shunt, inverting, flyback and line voltage switching power supplies. Motor types and their speed control strategies will be discussed. To keep pace with industry's greater use of variable frequency induction motor drives, students will study transistor and thyristor inverter designs. The use of SCR's and TRIAC's for power control, SCR chopper circuits for DC motor drives and SCR inverters for DC-AC conversion will also be studied in detail. Thyristor DC motor speed control circuits, their feedback control theory and error and stability control will be studied in detail. BODE phase and gain margin criterion will be used for stability analysis. The final section of the course includes an opportunity to implement industrial control circuits using programmable logic controllers (PLC's). Prerequisite: ELEX 3320 or 3515 or 3210, 3310 or 3205.

ELEX 4325 (ELEX 416) Microcontroller Systems 2—This course continues the work done in ELEX 3305 on the single chip microcontroller and its use in industry measurement, control and data acquisition applications. Prerequisite: ELEX 3305, 3310.

ELEX 4330 (ELEX 419) Technical Project (Control)—In the final term, students are required to research, design, prototype and evaluate a technical project within their fields of interest. Formal documentation in the form of a written report is required. An oral report is also required. Projects may be undertaken individually, in pairs, or in larger groups if required by the nature of the project. Prerequisite: ELEX 3325, 4510*, 4305, 4310*, 4315*, 4320*, 4325*, COMM 2443* (*may be taken concurrently).

ELEX 4405 (ELEX 421) Industrial Systems—Teaches the design of electrical systems for industrial plants and commercial buildings. Topics include lighting systems, feeder calculations and ratings, motor branch feeders, motor control centres, switchboards, unit substations, demand factors, voltage levels, grounding, ground fault and system protection and co-ordination together with all appropriate sections of the Canadian Electrical Code. In this course students learn how to apply the Canadian Electrical Code to the design of lighting and power distribution systems for commercial and industrial buildings. Prerequisite: ELEX 3325 or 3405 or permission.

ELEX 4410 (ELEX 424) Power Systems—Commences with an overview of present and future energy sources followed by the circuit analysis of electrical power transmission systems. 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; determination of available short circuit currents; protective relaying. Prerequisite: ELEX 3325 or 3405 or permission.

ELEX 4415 (ELEX 425) Electrical Equipment and PLC's—A continuation of ELEX 3325 with a more detailed study of AC and DC motors and their applications. This is followed by a study of electrical protection which begins with review, then expands upon fuses and circuit breakers and the nature of electrical abnormalities. A detailed study is made of electrical protective devices. The final section of the course deals with electrical control and applications including motor starting equipment and relay and programmable control systems. Students will receive hands-on experience with programmable controllers. Prerequisite: ELEX 3325 or 3405 or permission.

ELEX 4430 (ELEX 429) Technical Projects (Power)—Students (working in teams of 2-4) will undertake PLC programming and control projects on a selection of industrial PLC's and variable speed drives. Prerequisite: ELEX 4320, 4415, COMM 2443 (all may be taken concurrently) or permission.

ELEX 4505 (ELEX 431) Telecommunication Circuits and Systems 2—Schematics of several commercial transmitters and receivers are analyzed in detail using the manufacturer's documentation. The applications of circuits studied in Levels 1 through 3 are noted. The transmitting and receiving systems selected for analysis are typical examples of equipment used for various communications services, including general mobile, and avionic and marine radio. Cellular radio systems are examined in detail. The course also gives an introduction to the systems and circuits used for video signal transmission and reception (including color), and

examines the effects of noise and distortion on system performance. Labs give instruction on system test and evaluation procedures in accordance with DOC and EIA specifications. Prerequisite: ELEX 3305, 3505, 3510, 3515.

ELEX 4510 (ELEX 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, QPSK) and data coding (NRZ, RZ, Manchester) are presented. Error detection and correction is covered. Other topics include bandwidth bit rate limitations, character oriented (HDLC) and bit oriented (Bisync and HDLC) protocols, as well as networking schemes. This course is intended for the electronic technologist involved in hands-on work with data communication equipment at the chip level. Prerequisite: ELEX 3305, 3320 or 3515, and 3310.

ELEX 4515 (ELEX 436) Switching Networks/Fibre Optics—Introduces the current North American telecommunications network. Topics include evolution of the telephone system; transmission and switching; transmission media; frequency division multiplexing; time division multiplexing, pulse code modulation; electronic switching systems, space division and time division types; associated signalling, power and traffic considerations; fibre optic systems, types of fibres and their propagation characteristics (light sources, detectors, splices, connectors and couplers); system design considerations. Prerequisite: ELEX 3305, 3505, 4510* (*may be taken concurrently).

ELEX 4520 (ELEX 437) Microwave Principles and Systems—Introduces microwave principles and hardware, and their application in telecommunication, radar, etc., using microwave energy. Topics include sources of microwave energy, attenuating devices, frequency and power measuring devices, modulators, amplifiers, coupling devices and isolators; a study of high-capacity microwave communication links, and an analysis of satellite communication links. Prerequisite: ELEX 3510, 4505* (*may be taken concurrently).

ELEX 4525 (ELEX 438) Radio Frequency Circuit Design—Teaches how to design HF and VHF circuits. Topics include: impedance matching networks; wideband transformers; synthesis of low pass, high pass, band pass and bandstop Butterworth and Chebychev filters; 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; noise performance of amplifiers. Labs are project-oriented, requiring students to design, build and test various circuits applying theoretical knowledge. Prerequisite: ELEX 3505, 3510, 3515.

ELEX 4535 (ELEX 413) PC Software for Telecom —Introduces students to software packages used by telecommunications technologists. Included are Tango (schematic capture and printed circuit board layout), generic CADD (computer-aided design and drafting), and Lotus 1-2-3 (a spreadsheet). The course also introduces software used for PAL programming, digital simulation, analog simulation and PC interfacing. Prerequisite: ELEX 1110 and 3305.

***ELEX 4990 (ELEX 495) Cooperative Education Workterm 3**—This additional workterm is optional and may be taken to complete a project in industry that started during a previous workterm, or to satisfy students' interest in additional work experience, prior to graduation.

MATH 1431 (MATH 143) Basic Technical Mathematics for Electronics—Systems of linear equations, determinants, application to DC electronic networks. Common and natural logarithms, application to electric transients, decibels. Logarithmic and semilogarithmic graphs. Trigonometric functions, identities, solution of triangles applied to impedance and admittance diagrams. Complex numbers, rectangular/polar transformations, phasor representation of sinusoidal waveforms applied to AC networks. The derivative, differentiation, implicit differentiation, maxima/minima applied to electrical functions.

MATH 2431 (MATH 243) Calculus for Electronics—Implicit differentiation, related rates and approximation using differentials with application to electronic technology. Antidifferentiation, the indefinite and definite integral including evaluation of areas, AVG value and RMS value of a periodic waveform. Differentiation and integration of trigonometric, logarithmic, exponential and damped sinusoidal functions. Integration techniques including change of variables, integration by parts and partial fractions. First and second order differential equations with application to electronics technology. Fourier coefficients and line spectrum. Prerequisite: MATH 1431.

MATH 3431 (MATH 343) Transform Calculus for Electronics—Step and impulse functions. Laplace transforms of functions and mathematical operations. Partial fractions. Inverse Laplace transforms. Solutions of differential equations. Solutions of applied problems appropriate to the electronics technology. Prerequisite: MATH 2431.

OPMT 1141 (OPMT 141) Total Quality Management—The focus of this course is on Total Quality Management (TQM) a business philosophy that applies to the management of all company functions. TQM improves the effectiveness of an organization and results in increased productivity and competitiveness through the application of suggestions from team members rather than relying only on major technological or theoretical innovations. Topics include: the basic philosophy, values and culture of TQM; maximizing employee potential; tools used to improve quality; engineering design and quality; materials management; project management; cost allocation and fixed assets. The course will cover recent techniques used in striving for excellence in engineering design, production capability, process control, customer and supplier relationships, and production and inventory control. Prerequisite: Successful completion of all courses in Term 2.

PHYS 1143 (PHYS 106) Physics for Electronics 1—A general level course about physical quantities—their properties, relationships and connecting principles. Translational and rotational motion (force, mechanical energy, power) are studied, as well as basic electrostatics (charge and field), atomic physics and the band theory of solids and its application to semi-conductor devices. The labs emphasize measurement, data analysis and experimental techniques as they relate to the lecture material. Prerequisite: Math 12.

PHYS 2143 (PHYS 206) Physics for Electronics 2—Topics include magnetism, induced electromotive force, thermal energy, vibrations and waves, with particular reference to sound waves, electromagnetic waves, physical optics and nuclear physics. The accompanying laboratory program emphasizes measurement, data analysis and experimental techniques while confirming and extending the concepts presented during lectures/tutorials. The presentation is mostly non-calculus. Technological applications are identified throughout the course, where appropriate. Prerequisite: PHYS 1143.

*Enrolment in the Cooperative Education component is optional. See page 14 for more details.

Faculty and Staff

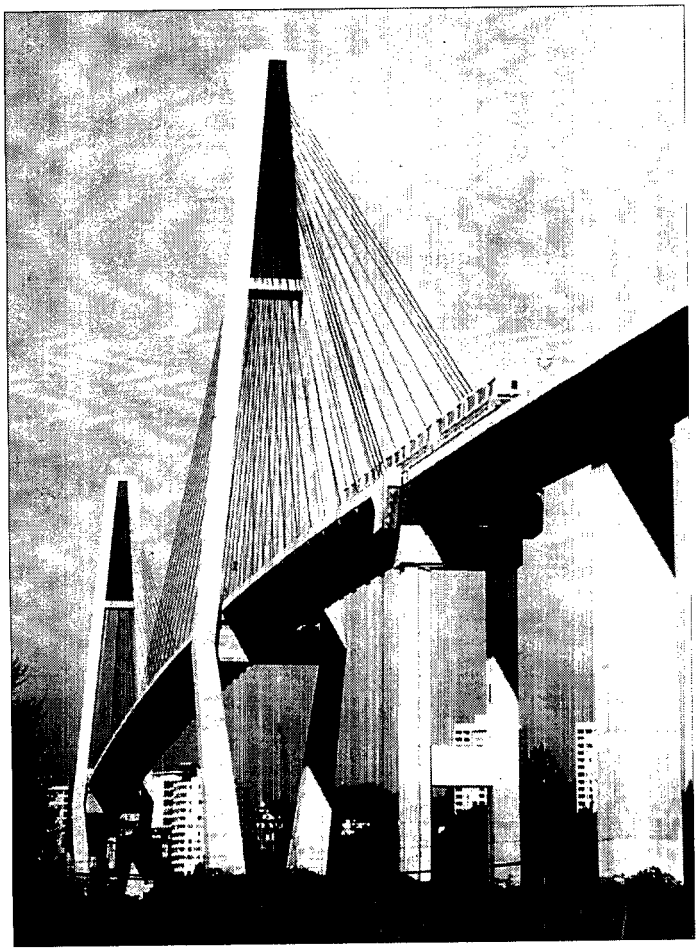
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E.A. Upward, Dipl.T., A.Sc.T., Co-ordinator, Co-op Education

Electronics Technology Advisory Committee

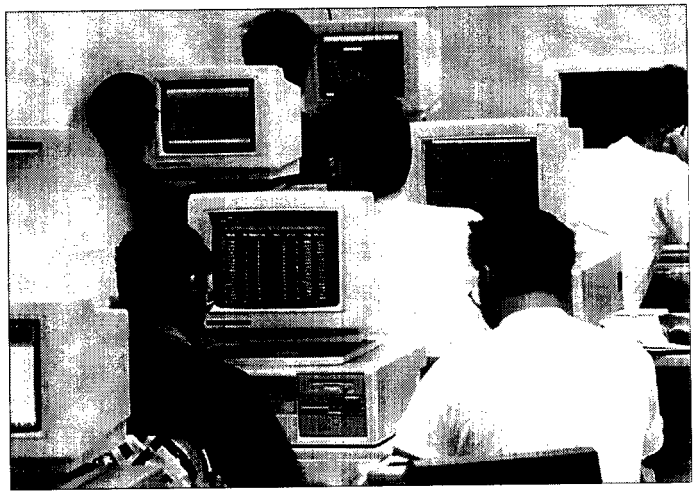
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R. Sigurdson, Employment & Immigration Canada
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SCHOOL OF ENGINEERING TECHNOLOGY

98/ ADMINISTRATION
Office of the Dean
Academic Studies
Biological Sciences
Civil Technologies
Computer Systems Technology
Mechanical Design and Manufacturing
Process Technologies
Renewable Resources Technology

98/ ACADEMIC STUDIES
How to Make Up Course Deficiencies
Special In-house Communication Courses
English Language Proficiency
Pre-entry Courses
Provisional Acceptance
Refresher Courses
Engineering Technology Entry Program (ETE)

101/ BIOLOGICAL SCIENCES
Biotechnology
Food Technology

101/ BIOTECHNOLOGY

103/ BUILDING TECHNOLOGY
Architectural Option
Economics Option

106/ CHEMICAL SCIENCES TECHNOLOGY
Environmental and Industrial Chemistry Option
Pulp and Paper Option

109/ CIVIL AND STRUCTURAL TECHNOLOGY
Geotechnical/Highways Option
Water Resources Option
Construction Option
Structures Option

114/ COMPUTER SYSTEMS TECHNOLOGY
Data Communication Systems Option
Decision Systems Option
Expert Systems Option
Information Systems Design
Microcomputer Systems Option

118/ FISH, WILDLIFE AND RECREATION

118/ FOOD TECHNOLOGY

120/ FORESTRY

120/ GEOGRAPHIC INFORMATION SYSTEMS

122/ MECHANICAL DESIGN & MANUFACTURING TECHNOLOGIES
CAD/CAM
Mechanical Design
Mechanical Manufacturing
Mechanical Systems
Plastics
Robotics and Automation
Industrial Education (Technology Education)
Teacher Education

134/ MINING

137/ NONDESTRUCTIVE TESTING

138/ PETROLEUM AND NATURAL GAS

140/ RENEWABLE RESOURCES
Forestry
Fish, Wildlife and Recreation

145/ SURVEYING AND MAPPING
Photogrammetry Option
Technician Program

149/ WOOD PRODUCTS MANUFACTURING

SCHOOL OF ENGINEERING TECHNOLOGY

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Terry Suen, Administrative Officer
Shameem Hameer, Administrative Assistant

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Food Sciences

Civil Technologies

Doug Deans, B.A., Associate Dean
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Civil and Structural
Geographic Information Systems
Surveying and Mapping

Computer Systems Technology

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Engineering Technology Entry Program

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Industrial Education (Technology Education) Teacher Education
Mechanical Advanced Diplomas
Mechanical Systems
Mechanical Technology
Plastics
Robotics and Automation

Process Technologies

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Chemical Sciences
Mining
Nondestructive Testing
Petroleum and Natural Gas
Quality Assurance and Nondestructive Testing
Wood Products Manufacturing

Renewable Resources Technology

J.T. Neilson, B.A.Sc., P.Eng., Associate Dean
Fish, Wildlife and Recreation
Forestry

ACADEMIC STUDIES

The Academic Studies Division offers Communication, Chemistry, Mathematics and Physics courses 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 review, or to students who do not have the necessary prerequisites for entrance into BCIT programs.

In addition the Division offers Refresher Mathematics and Refresher Physics specifically for students who need a brief review in these subjects. These refresher courses provide such a review but are not acceptable substitute prerequisites for mathematics or physics.

The Division also offers the Engineering Technology Entry (ETE) program. This 15-week day school program provides academic upgrading to students who wish to enroll in Engineering Technology programs.

Academic studies 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 the Engineering Technology Entry program, in September, January, and May.

  Interested students are encouraged to call 434-1610 for further information.

How to Make Up Course Deficiencies

Preparatory programs are available for those students who lack specific prerequisites or desire refresher courses. For information, contact Student Services at 434-3304.

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 your company's 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

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 program workload by reviewing the academic prerequisites.

Provisional Acceptance

A student who is lacking one or more prerequisites may still apply to be provisionally accepted into his/her desired technology program and enroll in the appropriate pre-entry course(s). Upon satisfactory completion of the necessary pre-entry course(s), the student will be fully accepted into the technology program. Pre-entry courses are offered in each of the BCIT terms: September, January, May, and throughout the summer months. Check the Part-time Studies flyer for dates, or phone 434-1610. The following Pre-entry courses are offered to those who need prerequisites or who wish to improve their existing grades:

Technical Mathematics: Introduction—For the School of Health Sciences and the School of Engineering Technology.

Effective Writing and Independent Learning Skills—Preparation courses for every technology.

Comprehensive Reading, Writing and Learning Skills—Preparation courses for every technology and BCIT equivalent of English 12 for every technology.

Technical English as a Second Language—Equivalent to BCIT's English Language requirement for second language students.

Chemistry—Chemistry 11.

Physics—Physics 11.

Pre-Entry Course Descriptions and Credits

Chemistry

CHEM 0001 (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 1101 (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; titrations. Lab work consists of qualitative and quantitative analysis. This course meets the Chemistry 12

entrance requirement for BCIT. Prerequisite: Chemistry 11 or CHEM 0001. 6 credits.

Communication

COMM 0004 (COMM 005) Technical English as a Second Language (80 hours)—If your language skills need upgrading before you can enroll in COMM 0005, this course is for you. It includes the speaking, listening, reading and writing skills needed to carry out the writing and speaking tasks in COMM 0005. This course includes intensive work on strategies for learning a language, speaking skills, error identification, sentence structure, guided writing, and paragraph writing.

A grade of 65% in this course will allow you to enroll in COMM 0005. You will have to write an English Proficiency Test to determine your eligibility to enroll in COMM 0004.

COMM 0005 (COMM 004) Technical English for Second Language Students (80 hours)—If your first language is not English and you have good writing skills, this course is for you. It includes the reading, writing, speaking and listening skills needed for BCIT full-time programs. Sentence and paragraph development, reading comprehension, vocabulary expansion, speaking skills, and library skills are emphasized. Grammatical skills are taught in conjunction with writing assignments. You'll also practice proofreading for major errors in sentence structure, grammar and vocabulary.

A grade of 65% in this course meets the prerequisite (a "P" in English 12 or equivalent) for many technologies.

A grade of 70% equals a "C" in English 12.

A grade of 75% or better meets the prerequisite (a C+ in English 12) for selected technologies.

Prerequisite: Applicants will write an English Proficiency Test to determine their eligibility for enrolment. If your language skills need upgrading, you will be required to complete COMM 0004 before enrolling in COMM 0005. Non credit.

COMM 0008 (COMM 003) Comprehensive Reading, Writing and Learning Skills (80 hours)—This course is designed for students whose first language is English and who have not completed Grade 12 High School English. It emphasizes the reading, writing and study skills needed for BCIT full-time programs. The course includes efficient reading, library research skills, reading comprehension, grammar, writing fundamentals and speaking skills.

A grade of 65% or higher in this course meets the prerequisite (a "P" in English 12 or equivalent) for many technologies.

A grade of 70% equals a "C" in English 12.

A grade of 75% or better meets the prerequisite for selected technologies (a C+ in English 12).

Prerequisite: Applicants will write an English Proficiency Test to determine their eligibility for enrolment. Students for whom English is a second language should enroll in COMM 0005. Non credit.

COMM 0020 (COMM 002) Independent Learning Skills (24 hours)—Learn how to read efficiently, cope with assignments, use computer-managed learning packages, study independently, take exams successfully, manage your time and get the most from new instruction techniques. Includes methods for reading textbooks and learning from objectives. Non credit.

COMM 0021 (COMM 001) Effective Writing (24 hours)—Prepares students for writing requirements in full-time programs at BCIT. Especially useful for students who need to develop their basic skills in business and technical writing. Concentrates on paragraph development, organization and effective sentences in letter and memo writing. Non credit.

Mathematics

MATH 0001 (MATH 001) Technical Mathematics Introduction—An upgrading 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 Math 12 entrance requirements at BCIT. Students intending to enter a technology which requires a Math 12 grade of C+ or better, must achieve a final mark of 65% or higher in MATH 0001. Prerequisite: C or better in Math 11 or approved equivalent math course. Non credit.

MATH 0002 (MATH 002) Technical Mathematics Introduction (Correspondence)—Flexible entry correspondence course that satisfies the Math 12 entrance requirement for BCIT. Students intending to enter a BCIT technology which requires a Math 12 grade of C+ or better must achieve a final mark of 65% or higher in MATH 0002. 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 0001). Prerequisite: A pass in Math 11 or an approved equivalent mathematics course. Non credit.

Physics

PHYS 0309 (PHYS 009) Pre-entry and ETE Physics—Covers those topics in applied physics which are important for success in BCIT programs with Physics 11 as a prerequisite. Topics include kinematics, dynamics, equilibrium, energy, fluids, heat, electrostatics and DC circuits. Emphasis is placed on problem-solving. There is a laboratory component to the course. This course meets the Physics 11 entrance requirement for BCIT programs, with a grade of 65% or better required for programs specifying C+ in Physics 11. Prerequisite: Mathematics 11. Non credit..

Refresher Courses

MATH 0004 (MATH 003) Refresher Mathematics—A review of mathematical techniques essential for success in basic technical math and calculus courses in BCIT technology programs. Topics include common algebraic methods for solving equations, simplifying expressions, manipulating formulas, etc.; basic trigonometry; graphing properties of common geometric figures; techniques for solving problems. Emphasis will be placed on developing practical skills and systematic approaches to solving problems and verifying the solutions. This course is for students who have met the Math 12 prerequisite for their programs, but have not used basic mathematical techniques for several years and would like to strengthen them. Prerequisite: Math 12 or equivalent. Non credit.

PHYS 0304 (PHYS 004) Refresher Physics—Provides a review of the basic Physics 11 concepts which are important for success in most first-year physics courses in BCIT technology programs. Topics include kinematics, dynamics, mechanical energy, electricity and optics. There will be some lab exercises and problem-solving skills will be emphasized. This course is recommended for students who have taken Physics 11 more than one year ago, who have not applied the concepts and need to refresh their skills. Prerequisite: Physics 11 or equivalent. Non credit.

Engineering Technology Entry Program

This 15-week day school program provides academic upgrading to students wishing to enroll in an Engineering Technology program at BCIT. The ETE program provides courses in chemistry, communication, mathematics and physics which meet the School of Engineering Technology prerequisites in these areas.

The program also includes an introductory course in computer applications and a general interest seminar course. This program is one term (15 weeks) in duration. The program will be offered three times a year, with intakes in September, January, and May.

Students enrolled in the ETE program could be provisionally accepted (at the time of enrolment) into an Engineering Technology program in the subsequent term, subject to satisfactory completion of the ETE program. Prerequisite: English 11 and Mathematics 11 or equivalent.

ETE Courses		Clrm hrs/wk
CHEM 0010	Introductory Applied Chemistry	6.0
COMM 0007	Introductory Communication	6.0
COMP 0107	Computer Literacy	2.0
MATH 0005	Introductory Technical Mathematics	7.0
NTRY 0301	Technology Entry Seminar	1.0
PHYS 0309	Pre-entry and ETE Physics	7.0

Students will normally take either chemistry or physics, depending on which subject is not a prerequisite for the Engineering Technology program for which they have applied for provisional acceptance. Core courses (Computer Literacy, Math, Communication and the ETE seminar) are essential in order to maintain status as an ETE student.

For further information on the Engineering Technology Entry Program, please call Student Services at (604) 434-3304, or toll-free at 1-800-667-0676.

ETE Course Descriptions and Credits

CHEM 0010 (CHEM 010) Introductory Applied Chemistry—Covers those chemistry topics which are essential for success in BCIT programs with Grade 11 Chemistry as a prerequisite. Topics include basic atomic structure, elements and compounds, chemical reactions, solutions, acids and bases, and oxidation reduction reactions. This course meets the Chemistry 11 entrance requirement for BCIT programs. Non credit..

COMM 0007 (COMM 010) Introductory Communication—Emphasizes reading, writing and study skills needed for BCIT programs. Develops basic skills in technical writing, including paragraph development, organization and effective sentences in letter and memo writing. Also includes word processing, efficient reading, library research skills, reading comprehension and study skills. A grade of 65% or higher meets the English 12 "P" entrance requirement of many BCIT technologies. A grade of 75% meets the English 12 C+ entrance requirement of some technologies. Prerequisite: English 11 or equivalent. Non credit.

COMP 0107 (COMP 010) Computer Literacy—This computer lab course introduces students to DOS fundamentals, word processing and spreadsheets, including graphical applications. DOS topics include computer terminology and common file commands. Word processing topics include basic text entry and editing, formatting, block commands and file commands. Spreadsheet topics include data entry, functions, graphics, file commands and simple macros. Non credit.

MATH 0005 (MATH 005) Introductory Technical Mathematics—Covers those topics in technical mathematics which are important for success in BCIT programs with Mathematics 12 as a prerequisite. Topics include algebraic operations, simple equations, ratios, basic geometry, quadratic equations, logarithms, graphs, linear equations and trigonometry. This course meets the Mathematics 12 entrance requirement for BCIT programs, with a grade of 65% or better required for programs specifying C+ in Mathematics 12. Prerequisite: Math 11 or Algebra 11 or Program Head approval. Non credit.

NTRY 0301 (NTRY 001) Technology Entry Seminar—Includes a variety of topics of interest to ETE students involving relationships with fellow students, the ETE program, BCIT, stress management, financial management, institute resources, career opportunities and business and industry concerns. Other topics will be decided through instructor-student discussions.

PHYS 0309 (PHYS 009) Pre-entry and ETE Physics—Covers those topics in applied physics which are important for success in BCIT programs with Physics 11 as a prerequisite. Topics include kinematics, dynamics, equilibrium, energy, fluids, heat, electrostatics and DC circuits. Emphasis is placed on problem-solving. There is a laboratory component to the course. This course meets the Physics 11 entrance requirement for BCIT programs, with a grade of 65% or better required for programs specifying C+ in Physics 11. Prerequisite: Mathematics 11. Non credit..

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Pam Curtis, Secretary
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Barbara Schillinger, B.A., M.A.
Jean Scribner, B.A., M.A.
Rudy Spence, B.Comm., B.A., M.Ed.
Don Steele, B.A. (Hons.)
David Vale, B.A., B.Ed., M.Ed.
Kathy Vance, B.A. (Hons.), M.A., Ph.D.
Susan Woo, B.Sc.

Mathematics Department
Eric Hiob, B.Sc., M.Sc., Ph.D., Program Head
Camille Abel, Secretary
Maria Bojadziev, Dip.Ing.
Jack Brown, B.Sc. (Hons.), M.A.
Andy Chu, B.A.Sc., P.Eng.
Graham Cocksedge, B.Sc.For., M.Eng.
Clayton Copping, B.Sc.
Stella Dumitrescu, B.A.Sc., M.Sc.
Andy Ellingsen, B.Sc.
Peter Hobbins, B.Sc.
Jeanne Kurz, B.Sc., M.Sc., Ph.D.
Colin Lawrence, B.Sc. (Hons.)
E. Ron Martin, B.Sc., M.Ed.
Louise Routledge, B.A., B.Ed., C.Q.E.
David Sabo, B.Sc. (Hons.)
Val Sawadsky, B.A., B.Sc. (Hons.)
Endre Toth, B.Sc.
Brian Turner, B.Sc.

Physics Department
Donna MacDuff, B.Sc., Cert.Ed., Program Head
Rosalie Loverock, Secretary
Gary Bodnar
Cor Deurzen, B.Sc., M.A., Ph.D.
Frank DiSpirito, B.A.Sc, M.A.Sc.
Len Greenwood, B.Eng., B.A., Cert.Ed.
Dieter Hecker, Dipl.Tech.
Dave Kenyon, B.Sc.
Amar Kshatriya, B.Sc., M.Sc., C.P.G.S. (Cantab.), M.Ed.
Ann McArthur, B.Sc. (Hons.), Cert.Ed. (Cantab.)
Umit Olcay, B.Sc.
Walter Olson, B.Sc., M.Sc.
Barry Pointon, B.Sc., M.Sc.
J. Richard Saunders, B.Sc., M.Sc.
Gary Schellenberg, Dipl.Tech.
Owen Shuen, B.A.Sc., B.Sc.
Dave Thom, B.Sc.
Wayne Withers
On Leave
Ron Knott, B.A. (Hons.), M.Ed.
Eileen Stephens, B.A., M.A.

BIOLOGICAL SCIENCES

Diploma Programs

Two programs are offered in Biological Sciences: Biotechnology and Food Technology. Both of them offer secure and worthwhile career possibilities in a variety of settings.

See Biotechnology, below.
See Food Technology, page 118.

BIOTECHNOLOGY

Diploma Program

Biotechnology, an important and challenging twentieth century technology, makes use of such modern tools as gene splicing, protein engineering and cell fusion.

Job Opportunities

Biotechnology graduates will be employed by biological research laboratories, pharmaceutical manufacturers, analytical laboratories, and nurseries involved in the cloning of plants and trees.

Graduates are employed as scientific research technicians by B.C. Research, Helix Biotechnology, Quadra Logic Technologies, the Biomedical Research Centre, UBC and the B.C. Cancer Agency. As Laboratory Technicians, graduates perform biochemical/ microbiological testing for employers such as GVRD and Environment Canada. Beginning salaries range from $24,000 to $27,000/ annum for a Laboratory/Research Technician.

Program Length

Two years full-time beginning in September each year.

Total Fees (subject to change—does not include book or supply costs)

$3,965.30 for the two-year program (1993/94).

Degree Transfer/Completion

Simon Fraser University grants up to two years credit towards a B.Sc. in Biological Sciences to graduates of this program.

Prerequisites

High school graduation with English 12, Math 12 and Chemistry 11 are course requirements for the Biotechnology program. ***Note:** Biotechnology is currently under curriculum review. There may be adjustments to the courses listed below.

Program: BIOTECHNOLOGY

			Clrm Hrs/wk
Level 1			
BIOT	1020	Introductory Microbiology	6.0
BIOT	1310	Introductory Biotechnology	4.0
CHEM	1103	Chemistry 1 for Bio Sciences	6.0
FOOD	1030	Biology	5.0
MATH	1441	Basic Technical Mathematics	6.0
PHYS	1144	Physics: Bio Sciences/ Biotechnology 1	5.0
Level 2			
BIOT	2300	Microbiology for Biotechnology	6.0
BIOT	2310	Laboratory Operation	3.0
CHEM	2203	Chemistry 2 for Bio Sciences	6.0
COMM	1244	Communication for Biotechnology	3.0
MATH	2441	Statistics for Biological Sciences	5.0
OPMT	1243	Operations Management	2.0
PHYS	2144	Physics: Bio Sciences/ Biotechnology 2	5.0
Level 3			
BIOT	3300	Industrial Microbiology	6.0
BIOT	3320	Molecular Genetics 1	6.0
BIOT	3330	Plant Cell Biology	7.0
BIOT	3340	Biochemistry 1	6.0
CHEM	3311	Instrumental Analytical Methods	5.0
Level 4			
BIOT	4320	Molecular Genetics 2	6.0
BIOT	4330	Animal Cell Biology	6.0
BIOT	4340	Biochemistry 2	6.0
BIOT	4360	Process Systems for Biotechnology	6.0
BIOT	4380	Directed Studies	4.0
COMM	2444	Advanced Communication for Biotechnology	2.0

Course Descriptions

BIOT 1020 (BISC 102) Introductory Microbiology—The course is designed to train students in the basic microbiological procedures employed in a laboratory: the use and care of the microscope; staining methods, aseptic techniques; methods of identifying important micro-organisms.

BIOT 1310 (BISC 131) Introductory Biotechnology—A survey of all aspects of biotechnology including the ethical implications of this technology. Topics include: fermentation, single cell protein, recombinant DNA, monoclonal antibodies, cell culture, and enzymes.

BIOT 2300 (BISC 230) Microbiology for Biotechnology—The application of microbiology to biotechnology. Topics include taxonomy, microbial physiology, microbial genetics, and their applications in biotechnology. Prerequisite: BISC 1020.

BIOT 2310 (BISC 231) Laboratory Operation—Lecture material will cover laboratory safety procedures for handling hazardous chemical and biological material; laboratory management, including purchasing and inventory control as well as laboratory equipment and services.

BIOT 3300 (BISC 330) Industrial Microbiology—The use of microorganisms to produce marketable products or services. Topics include fermentation systems for alcohol, organic chemicals, and pharmaceuticals; waste management and microbial sewage treatment; single cell protein; food microbiology; and the control of microbial bio-deterioration. Prerequisite: BIOT 2300.

BIOT 3320 (BISC 332) Molecular Genetics 1—An introduction to genetics viewed from the molecular level. Topics include Mendel's laws, gene replication, gene regulation and recombinant DNA. Prerequisite: BIOT 2300.

BIOT 3330 (BISC 333) Plant Cell Biology—This course will deal with techniques of plant regeneration through somatic embryogenesis and organogenesis. It will also include micropropagation of herbaceous and woody plants, virus eradication techniques, protoplast fusion and production of haploid plants. Genetic engineering of single cells and regeneration of genetically-transformed cells are additional topics. Prerequisite: FOOD 1030.

BIOT 3340 (BISC 334) Biochemistry 1—This course deals with the aspects of biochemistry relevant to biotechnology. The structure and properties of molecules (proteins, lipids, hormones, etc.) will be examined as well as their role in metabolism. Principles learned will be applied to problems in biotechnology.

BIOT 4320 (BISC 432) Molecular Genetics 2—The application of molecular genetics to human health care, agriculture, forestry, veterinary medicine, microbiology and aquaculture. Prerequisite: BIOT 3320.

BIOT 4330 (BISC 433) Animal Cell Biology—Cell biology is the search for structure/function relationships at the sub-cellular level. This course examines the inner workings of the animal cell and the application of this knowledge to biotechnology. Topics include in-vitro cell culture and manipulation, immunology, and the production of monoclonal antibodies. Prerequisite: BIOT 3320, 3340.

BIOT 4340 (BISC 434) Biochemistry 2—A continuation of BIOT 3240. This course covers the applications of biochemistry to biotechnology. Protein purification and characterization, enzyme kinetics and analysis, and enzyme probes, etc. Prerequisite: BIOT 3340.

BIOT 4360 (BISC 436) Process Systems for Biotechnology—This course covers fermentation technology and downstream processing of biotechnology products. The operation of equipment such as fermenters, freeze-driers, filtration systems and industrial centrifuges is discussed. Instrumentation for process control and product analysis is covered. The application of biotechnology systems to waste management is stressed. Prerequisite: BIOT 2310, 3300.

BIOT 4380 (BISC 438) Directed Studies for Biotechnology—Students will select projects and prepare a formal report on some aspect of biotechnology. Projects may have a laboratory component in which students perform experiments toward their projects under the supervision of an industry or faculty sponsor.

CHEM 1103 (CHEM 103) Chemistry 1 for Biological Sciences—An introductory course on 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 including WHMIS are emphasized.

CHEM 2203 (CHEM 203) Chemistry 2 for Biological Sciences—An introductory organic chemistry course with specific topics related to biotechnology. Topics include carbohydrates, lipids, proteins, solvents. Isomerism of selected compounds is discussed. Laboratory exercises consist of quantitative, and qualitative analysis and separation of organic compounds. Prerequisite: CHEM 1030.

CHEM 3110 (CHEM 311) Instrumental Analytical Methods—Instrumentation used for chemical analysis. The theory, construction, application and operation of instrumentation is discussed. Instruments include: spectrophotometry (visible, UV, NIR and infra-red, emission, absorption), flame photometry, chromatography (gas, liquid, high pressure liquid). Laboratory exercises involve use of these instruments. Prerequisite: CHEM 2030.

COMM 1244 (TCOM 119) Communication for Biotechnology—This course teaches the skills necessary for success in the biotechnology industry. Students learn practical writing, speaking and presentation techniques, and the correct formats for short reports, instructions and lab reports. They also research and deliver an oral report on a new development in their technology, write a skill-focused career package, take part in a meeting, and give a persuasive oral presentation.

COMM 2444 (TCOM 219) Advanced Communication for Biotechnology—This course teaches how to do up-to-the-minute research in biotechnology, critically analyze the results of that research and present the results in a seminar. Students will also prepare a career package of their skills and qualifications. Prerequisite: COMM 1244.

FOOD 1030 (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.

MATH 1441 (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 and other applications of the derivative, the differential, anti-derivatives, indefinite integral, definite integral with area under a curve. Introduction to MS-DOS computing using spreadsheet software.

MATH 2441 (MATH 244) Statistics 1 and 2 for Biological Sciences—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.

OPMT 1243 (OPMT 243) Operations Management—These sessions will cover the use of computers with database, word processing and spreadsheet programs. The interfacing of computers with laboratory equipment for data acquisition and control will also be covered.

PHYS 1144 (PHYS 102) Physics: Biosciences/Biotechnology 1—An introductory course which covers a wide range of physical principles, with special relevance to biological sciences technology. First term topics include kinematics, dynamics, friction, statics, energy, power, circular motion, momentum, properties of solids, fluids and fluid mechanics.

PHYS 2144 (PHYS 202) Physics: Biosciences/Biotechnology 2—Second term topics include temperature, heat, calorimetry, kinetic theory, heat transfer, basic electricity and magnetism, colorimetry, optics and radiation. Measurement, data analysis, experimental techniques and report writing are emphasized. Prerequisite: PHYS 1144.

Faculty and Staff

P.A. Barran, B.Sc., M.Sc., Ph.D., R.P.Biol., Program Head, Biotechnology
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K. Turner, B.Sc., M.Sc., P.Ag.

Advisory Committee Members: Biotechnology

C. Breuil, Paprican
L. Kemp, Simon Fraser University
M. Little, Syndel Laboratories Ltd.
A. Matheson, University of Victoria
W.R. McMaster, University of B.C.
J. Mueller, NRC—IRAP
P. Logan, Quadra Logic Technologies
D. Kilburn, University of B.C.
H. Ziltener, Biomedical Research Centre (Chairman)

BUILDING TECHNOLOGY

Diploma Program

Spiralling advances in technology have increased the public's expectation of their communities and the buildings constructed in 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. These two factors, high public expectations and the dynamic nature of the industry, present both a challenge and an opportunity—attractive criteria for any career.

Job Opportunities

Graduates of Building Technology perform many tasks of a technological nature as part of the interdisciplinary team of professionals and tradespersons involved in the building design, construction and management process. Graduates have the advantage of understanding buildings from several perspectives—the architectural and structural elements; the mechanical, plumbing, drainage, and electrical systems; the feasibility implications and the contractual and managerial processes.

Graduates of Building Technology become senior drafting personnel, job captains, specification writers, estimators or contract managers, building inspectors, officials in property management departments, appraisers and assessors, partners in construction organizations and technical representatives for building suppliers and equipment manufacturers. Many graduates will become estimators with general and sub-trade contractors, preparing bids and checking job costs and progress. Some continue into architectural careers.

The growing field of Building Technology presents opportunities in consulting offices, assisting in design, specification writing and construction inspecting; with contractors, estimating, making shop drawings and supervising; with suppliers, explaining the capabilities and applications of equipment and systems.

The Program

This Diploma program is designed to give both men and women a sound preparation for rewarding careers in many areas of the construction industry.

All students follow a common two-year program which includes lectures, drafting room practice and field trips. In the second year (subject to departmental approval) students may choose from one of two areas of specialization:

Architectural—primarily intended for those students who plan to work in architectural offices, offer design services, or pursue an architectural degree.

Economics—primarily intended for those students who plan to follow careers in construction and project management.

Students are often able to further their education through summer jobs with architects, engineers, developers and contractors or by doing inspection work for public and private agencies.

Program Length

Two years full-time beginning in September each year.

Total Fees (subject to change—does not include book or supply costs)

$3,965.30 for the two-year program (1993/94).

Post-graduation

The Canadian Institute of Quantity Surveyors will accept graduates as Probationer Members and gives credit in a similar manner. Information on this professional development possibility is available from the Program Head.

Prerequisites

High School graduation with English 12, Math 12 and Physics 11 all with C, or better, are minimum course requirements for this program. Preference will be given to applicants who have: a B grade or better in the prerequisites, post-secondary experience, construction industry experience.

The program is currently under review in consultation with the Building Industry's Advisory Committee.

Program: BUILDING

Level 1 (Term 1 15 weeks)			Clrm Hrs/wk
BLDG	1000	Building Drawing	3.0
BLDG	1050	Construction Site Processes	3.0
BLDG	1200	Building Construction 1	6.0
BLDG	1400	Introduction to Computers	3.0
CIVL	1200	Building Structures 1	3.0
COMM	1140	Technical Communication for Building	4.0
MATH	1401	Basic Technical Mathematics for Building	5.0
PHYS	1140	Applied Physics for Building 1	4.0

Level 2 (Term 2A 10 weeks)			
BLDG	2000	Planning	2.0
BLDG	2200	Building Construction 2	6.0
BLDG	2250	Construction Contracts 1	2.0
BLDG	2400	CADD for Building	3.0
CIVL	2201	Building Structures 2	3.0
COMM	2240	Technical Communication for Building	3.0
MATH	2401	Calculus and Analytic Geometry for Building	5.0
OPMT	1185	Project Management	2.0
PHYS	2140	Applied Physics for Building 2	4.0

Level 2 (Term 2B 10 weeks)			Clrm Hrs/wk
BLDG	2000	Planning 2	3.0
BLDG	2200	Building Construction 2	6.0
BLDG	2300	Construction Estimating 1	4.0
BLDG	2405	CADD Applications for Building	3.0
CIVL	2201	Building Structures 2	3.0
ELEX	1805	Illumination	2.0
MATH	2401	Calculus and Analytic Geometry for Building	5.0
PHYS	2140	Physics for Building	4.0

Option: ARCHITECTURAL

Level 3 (15 weeks)			
BLDG	3000	Architectural Option 1	6.0
BLDG	3200	Building Construction 3	6.0
BLDG	3300	Construction Estimating	4.0
BLDG	3350	Construction Specifications	2.0
BLDG	3500	Codes and Regulations	2.0
CIVL	3202	Building Structures 3	3.0
COMM	3340	Advanced Technical Communication	2.0
ELEX	1805	Illumination	3.0
MSYS	3880	Introduction to Mechanical Systems in Buildings	5.0

Level 4 (Term 4A 10 weeks)			
BLDG	4000	Architectural Option 2	6.0
BLDG	4200	Building Construction 4	6.0
BLDG	4300	Construction Estimating	34.0
BLDG	4350	Construction Specifications	2.0
BLDG	4505	Building Acoustics	2.0
CIVL	4203	Building Structures 4 (Architectural)	3.0
MECH	3980	Space Conditioning	2.0
OPMT	1260	Operations Management Fundamentals for Building	2.0

Level 4 (Term 4B 10 weeks)			
BLDG	4250	Construction Contracts 2	2.0
BLDG	4001	Architectural Option/ Projects	10.0
BLDG	4200	Building Construction 4	6.0
BLDG	4300	Construction Estimating	4.0
BLDG	4400	Construction Management	3.0
SURV	1120	Surveying for Building	3.0

Option: ECONOMICS

Level 3 (Term 3 15 weeks)			Clrm Hrs/wk
BLDG	3050	Economics Option 1	6.0
BLDG	3200	Building Construction 3	6.0
BLDG	3300	Construction Estimating 2	4.0
BLDG	3500	Codes and Regulations	2.0
CIVL	3202	Building Structures 3	3.0
COMM	3340	Advanced Technical Communication for Building	2.0
ELEX	2810	Electrical Systems	3.0
MSYS	3880	Introduction to Mechanical Systems in Buildings	5.0

Level 4 (Term 4A 10 weeks)			
BLDG	4050	Economics Option 2	6.0
BLDG	4200	Building Construction 4	6.0
BLDG	4250	Construction Contracts	2.0
BLDG	4300	Construction Estimating 3	4.0
BLDG	4350	Construction Specifications	2.0
BLDG	4505	Building Acoustics	2.0
CIVL	4203	Building Structures 4	3.0
MECH	3980	Space Conditioning	2.0
OPMT	1260	Operations Management Fundamentals for Building	2.0

Level 4 (Term 4B 10 weeks)			
BLDG	4051	Economics Option Projects	10.0
BLDG	4200	Building Construction 4	6.0
BLDG	4300	Construction Estimating	4.0
MATH	4401	Mathematical Methods/Computing for Building	4.0
SURV	1120	Surveying for Building	3.0

Course Descriptions

BLDG 1000 (BLDG 101) Building Drawing—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 together with an emphasis on three-dimensional drawing techniques.

BLDG 1050 (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 practice layouts.

BLDG 1200 (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 1400 (BLDG 125) 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 2000 (BLDG 200) 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 1000.

BLDG 2200 (BLDG 202) Building Construction 2—Continuation of BLDG 1200. Prerequisite: BLDG 1200.

BLDG 2250 (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. Prerequisite: BLDG 1050, 1200.

BLDG 2300 (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 1200.

BLDG 2400 (BLDG 209) CADD for Building—Microcomputer-based CADD using AutoCAD 2.62 software on AT's. The course includes an introduction to CADD machine components, architectural working drawings, log-on procedures and display. An introduction to autoread functions is included. Prerequisite: BLDG 1400.

BLDG 2405 (BLDG 225) CADD Applications for Building—CAD applications are studied and used to perform tasks associated with construction and architectural drafting. An industry approved CAD program (currently AutoCAD) is used to allow the student to gain hands-on experience. Topics include advanced editing functions, complex entity creation, dimensioning, block transfers and plotting. Prerequisite: BLDG 2400.

BLDG 3000 (BLDG 309) Architectural Option 1—Short history of contemporary architecture and building. Conceptualization and planning, theory, aesthetics and structure as integral parts of design. Space planning, retrofit design; residential design; introduction to model building. Prerequisite: Completion of first year program.

BLDG 3050 (BLDG 316) Economics Option 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 3200 (BLDG 302) Building Construction 3—Continuation of BLDG 2200. 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 2200.

BLDG 3300 (BLDG 306) Construction Estimating 2—Continuation of BLDG 3300 (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 2300.

BLDG 3350/4350 (BLDG 305/405) 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 1050, 2200.

BLDG 3500 (BLDG 313) 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 2000, 2200.

BLDG 4000 (BLDG 408) Architectural Option 2—Continuation of BLDG 3000. Graphics and freehand drawing of architectural subject matter. Advanced design projects/problems. Architectural model making. Extensive seminar discussion; possible guest lecturers and field trips. Prerequisite: BLDG 3000.

BLDG 4001 Architectural Option/ Projects—Continuation of BLDG 4000 with heavy emphasis on a building design project.

BLDG 4052 (BLDG 415) Economics Option 2—Continuation of BLDG 3050. Financial management and contract management. Cost accounting and budget

control methods. Bid strategies and procedures. Development of feasibility studies. Presentation of reports on construction economics and jobsite controls. Techniques of costing, pricing and analysis of economic data. Prerequisite: BLDG 3050.

BLDG 4051 Economics Option/Projects—Continuation of BLDG 4050 with a heavy emphasis on a construction management project.

BLDG 4200 (BLDG 402) Building Construction 4—Continuation of BLDG 3300. Prerequisite: BLDG 3200.

BLDG 4250 (BLDG 304) Construction Contracts 2—Continuation of BLDG 2250 Detailed examination 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 2250.

BLDG 4300 (BLDG 406) Construction Estimating 3—Continuation of BLDG 3300. 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 3300.

BLDG 4400 (BLDG 411) Construction Management/Computer Spreadsheets—Provides the opportunity to apply problem-solving methodology to typical construction management problems. Emphasis will be on problems associated with large comprehensive housing projects, high-rise construction, and other large construction projects. The course includes project control, task scheduling, motion economy and productivity. Prerequisite: BLDG 1050, 2300, 3300.

BLDG 4505 (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 with appropriate acoustical and aesthetic qualities for building. Calculations encountered in acoustical considerations. Prerequisite: BLDG 3200.

CIVL 1200 (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 analyze 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 problem-solving tutorial sessions.

CIVL 2201 (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 1200.

CIVL 3202 (CIVL 345) Building Structures 3—Emphasizes elementary structural design concepts for timber, steel and reinforced concrete structures. Students become familiar with design aids such as handbooks, manuals, catalogs and tables used in the construction industry. Course includes timber, steel and concrete, and concepts such as lateral stability and resistance to wind and earthquake forces. Prerequisite: CIVL 2201.

CIVL 4203 (CIVL 445) Building Structures 4—Basic concepts of soil mechanics, including identification and classification of soils, soil strength and settlement. Shallow and deep foundations. Retaining walls. Excavation protection, dewatering, seepage, compaction and consolidation, slope stability. Basic concepts of prestressed concrete including pre-tensioned and post-tensioned systems. Reinforced masonry as an alternative to reinforced concrete walls; pros and cons. Formwork for concrete. Prerequisite: CIVL 3202.

COMM 1140 (TCOM 102) Technical Communication for Building—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.

COMM 2240 (TCOM 201) Technical Communication for Building—In this applied communication course students learn the theory and practice of 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: COMM 1140.

COMM 3340 (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: COMM 1140, 2240.

ELEX 1805 (ELEC 150) Illumination—Deals with the types and characteristics of lighting sources; quantity and quality of light; lighting units, terminology and calculations.

ELEX 2810 (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 operation costs; recognize and avoid building designs that create costly electrical design problems. Prerequisite: ELEX 1805.

MATH 1401 (MATH 140) Basic Technical Mathematics for Building—Radian measure. Trigonometric functions, solution of triangles, and vectors. 3D trigonometry. Irregular areas and volumes. Exponentials and logarithm, decibel scale, financial mathematics related to building technology.

MATH 2401 (MATH 240) Calculus and Analytic Geometry for Building—Differentiation: the meaning of the derivative, rules, implicit differentiation and applications related to the technology (applied maxima/minima, related rates and differentials). Integration: indefinite integral, definite integral, fundamental theorem of calculus, and applications (areas, means, volumes, arc length, centroids, moment of inertia, work, beam stress analysis, etc.). Analytic geometry: circle, parabola, ellipse, hyperbola, with building architectural applications.

MATH 4401 (MATH 440) Microcomputer Applications for Building—Usage of spreadsheet software to model selected applications in building construction economics.

MSYS 3880 (MSYS 305) Heating Ventilating and Air Conditioning—An introduction to factors influencing indoor comfort and heat transfer in buildings, properties of air and air conditioning processes, considerations for zoning, solar radiation, and applications of H.V.A.C. systems with descriptions of function and operation of components. These principles will be applied to a small building of a non-specialized nature.

MSYS 3980 (MSYS 412) Plumbing Systems—Encompasses a study of principles and practices of plumbing systems with a strong emphasis on achieving an acceptable level of proficiency in understanding components, materials and design layout as applied to potable water, storm and sanitary systems.

OPMT 1185 (OPMT 185) Project Management—An introduction to the fundamentals of Critical Path Method (CPM) as it applies to project planning, scheduling,control and management. The course includes arrow, precedence and time logic diagrams, resource allocation, time cost analysis and the role of the computer.

OPMT 1260 (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 method study techniques to examine and improve the way in which a job is accomplished; work measurement techniques for estimating, planning, cost control and engineering economics.

PHYS 1140 (PHYS 125) Applied Physics for Building 1—A general physics course designed to meet the specific needs of Building Technology. There is a lab component which includes the use of computer data analysis software. Topics include statics, kinematics, linear and rotational dynamics, work and energy, simple machines and the basic properties of solids and fluids.

PHYS 2140 (PHYS 225) Applied Physics for Building 2—A general physics course designed to meet the specific needs of the Building Technology. There is a lab component which includes the use of computer data analysis software. Topics include thermodynamics (properties of gases, change of state, heat transfer, refrigeration and heat pumps), periodic motion (waves, SHM, sound), and electromagnetics (electrostatics, DC circuits, magnetism, induction, generators and motors, intro to AC), and light. Prerequisite: PHYS 1140.

SURV 1120 (SURV 120) Introduction to Survey for Building—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.

Faculty and Staff

D.C.Deans, B.A., Associate Dean
F.A.A. Alfeld, Dipl.Eng., Instructor
M. Gevers, B.Sc., B.Sc. (C.E.), P. Eng., Instructor
R. Guerin, A.Sc.T., Instructor
D.C. Hale, Dipl.T., Assistant Instructor
M. Elling, B. Econ.
M. Kuzych, B. Sc., B. Ed., B.Arch., M.R.A.I.C., M.A.I.B.C., Instructor
J.A. McInnes, P.Eng., Instructor
A. Maharajh, B.A., Dipl.T., A.Sc.T., M.C.I.Q.S. Part-time Studies Coordinator
M. Tanaka, B.Arch., M.R.A.I.C., M.A.I.B.C., Instructor
D. Yablonski, Dipl.T., A.Sc.T., Assistant Instructor

Building Technology Advisry Committee

A. Bailey, B.C. Building Corporation
M. Baker, Retired
K. Chandok, 401 West Georgia Management Ltd.
D. Charbonneau, Public Works Canada
T. Hamilton, E. W. Hamilton Ltd.
D. James, David H. James Ltd.
R. Letkeman, Ray Letkeman Architect, Inc.
D. McComb, Polygon Group Ltd.
E. Stregger, Costex Management Inc.
K. Wickham, Barclay Construction Ltd.

CHEMICAL SCIENCES TECHNOLOGY

Diploma Program

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 specialists.

The Program

This Diploma program offers the student a foundation in general science and technology in the first year of studies, with the opportunity for specialization in the 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 the student will have the opportunity to specialize in one of the following options:

Environmental and Industrial Chemistry: Includes courses covering detailed topics in air, water and soil sampling and analysis, air pollution control, industrial wastewater treatment processes and remediation of contaminated sites.

Pulp & Paper: Includes a detailed study of the pulp and paper industry including the kraft process, paper making, laboratory testing and environmental air, water and solid waste control.

Program Length

Two years full-time beginning in September each year.

Total Fees (subject to change—does not include book or supply costs)

$3,965.30 for the two-year program (1993/94).

Accreditation

The program is accredited by the Applied Science Technologists and Technicians of B.C.

Prerequisites

High School graduation with English 12, Chemistry 11 and Math 12 are course requirements for this program. Physics 11 and Chemistry 12 are strongly recommended.

Program: CHEMICAL SCIENCES

Level 1			Clrm Hrs/wk
CHEM	1101	Chemistry 1 for Chemical Sciences	16.0
CHSC	1100	Computer Applications for Chemical Sciences	1.0
CHSC	1103	Engineering Materials 1	3.5
CHSC	1119	Environmental Science	4.5
COMM	1135	Introduction to Technical Communication	3.0
MATH	1411	Basic Technical Mathematics for Chemical Sciences	5.0
MECH	1800	Interpretation of Technical Drawing	2.0
PHYS	1141	Physics: Chemical Sciences 1	5.0

Level 2			
CHEM	2201	Chemistry 2 for Chemical Sciences	6.0
CHEM	2204	Chemical Laboratory Techniques	3.0
CHSC	1202	Laboratory Workshop	1.5
CHSC	2203	Engineering Materials 2	3.5
CHSC	2248	Industrial Chemical Processes	3.5
COMM	2241	Technical Communication for Chemical Sciences	3.0
MATH	2411	Calculus for Chemical Sciences	5.0
MATH	2412	Statistics for Chemical Sciences	5.0
PHYS	2141	Physics: Chemical Sciences 2	5.0

Option: ENVIRONMENTAL AND INDUSTRIAL CHEMISTRY

Level 3			
CHEM	3309	Organic Chemistry 1 for Chemical Sciences	6.0
CHEM	3310	Physical Chemistry	5.0
CHEM	3314	Analytical Chemistry 1	6.0
CHSC	3320	Unit Project 1	2.0
CHSC	3341	Unit Operations 1	6.0
MATH	3411	Numerical Methods for Chemical Sciences	5.0

Level 4			
CHEM	4409	Organic Chemistry 2 for Chemical Sciences	6.0
CHEM	4414	Analytical Chemistry 2	6.0
CHSC	3448	Industrial Chemistry	2.0
CHSC	4420	Unit Project 2	3.0

Plus 4 Electives from the following lists:

			Clrm Hrs/wk
Environmental Chemistry			
CHEM	4416	Analytical Instrumentation	2.0
CHSC	3413	Environmental Analytical Methods	3.0
CHSC	4411	Pollution Science and Microbiology	6.0
CHSC	4412	Waste Management	3.0
Industrial Chemistry			
CHSC	4408	Ore Analysis	3.0
CHSC	4441	Unit Operations 2	6.0
ELEX	2830	Process Measurement	2.0
PETR	4403	Process Dynamics	3.0

Option: PULP AND PAPER

Level 3			
CHEM	3310	Physical Chemistry	5.0
CHEM	3314	Analytical Chemistry 1	6.0
CHSC	3320	Unit Project 1	2.0
CHSC	3341	Unit Operations 1	6.0
CHSC	3346	Pulp and Paper	6.0
MATH	3411	Numerical Methods for Chemical Sciences	5.0

Level 4			
CHEM	4414	Analytical Chemistry 2	6.0
CHSC	3413	Environmental Analytical Methods	3.0
CHSC	4421	Pulp and Paper Project	5.0
CHSC	4441	Unit Operations 2	6.0
CHSC	4446	Pulp and Paper 2	6.0
ELEX	2830	Process Measurement	2.0
PETR	4403	Process Dynamics	3.0

Course Descriptions

CHEM 1101 (CHEM 101) Chemistry 1 for Chemical Sciences—Topics include stoichiometry, nomenclature, chemical equilibrium, acid-base titrations, Ph, buffer solutions, solubility product, atomic structure and bonding. The application of chemical principles to industrial processes is emphasized. The lab work includes gravimetric, volumetric and qualitative analysis.

CHEM 2201 (CHEM 201) Chemistry 2 for Chemical Sciences—A continuation of CHEM 1101. Topics include oxidation-reduction titrations, electro-chemical cells, electrolysis, electroplating, properties of solids, liquids and gases, colligative properties and the chemistry of select metallic and non-metallic elements. The industrial application of chemical principles is emphasized. This course also contains a unit on laboratory safety which covers the toxicity, storage and disposal of chemicals. The lab work includes qualitative and quantitative analysis. Prerequisite: CHEM 1101.

CHEM 2204 (CHEM 204) Chemical Laboratory Techniques—This course emphasizes the safe analysis of natural samples where interfering elements or substances must be removed before the final analysis, with particular emphasis on safety awareness and application. The student will gain experience in: weighing, moisture and ashing; use of the muffle furnace and Parr Bomb; gravimetric separations and analysis; volumetric separations and analysis including acid-base, redox and complexometric determinations; ion exchange separation and analysis; spectrophotometric analysis; physical methods including viscosity and specific gravity measurements and use of the centrifuge. In addition, various solvent extraction, distillation and similar methods will be studied. The course starts with an introduction to sampling procedures. Prerequisite: CHEM 1101.

CHEM 3309 (CHEM 309) Organic Chemistry 1 for Chemical Sciences—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, aromatics, alcohol. Petroleum refining, addition polymerisation, synthetic rubber. Theory of infrared spectroscopy, interpretation of spectra. Prerequisite: CHEM 2201 and CHSC 2248.

CHEM 3310 (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 physiochemical measurements. Prerequisite: CHEM 2201.

CHEM 3314 (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 ore analysis for iron, chromium, tin, copper, arsenic, zinc, sulphur and silica, as well as fire assaying for gold and silver. Prerequisite: CHEM 2201.

CHEM 4409 (CHEM 409) Organic Chemistry 2 for Chemical Sciences—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. Prerequisite: CHEM 3309.

CHEM 4414 (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.). Prerequisite: CHEM 3314.

CHEM 4416 (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 1100 (CHSC 100) Computer Applications for Chemical Sciences—An introduction to microcomputer software packages including electronic spreadsheets, databases and graphical methods, with applications to Chemical Sciences Technology.

CHSC 1119 (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.

CHSC 1202 (CHSC 202) Laboratory Workshop—Instruction in basic workshop techniques including glass blowing, soldering, brazing and gas welding. Use of hand and bench tools.

CHSC 1203 (CHSC 203) Engineering Materials—Continuation of CHSC 103.

CHSC 2103 (CHSC 103) Engineering Materials—Physical testing of materials including metals, plastics, wood and wood products, concrete, ceramics and soils. Nondestructive testing. Microscopy, photomicrography and photography.

CHSC 2248 (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 and other B.C. chemical process industries. Lab sessions involve the testing and control procedures utilized in industrial applications.

CHSC 3311 (CHSC 311) Pollution Science and Organic Chemistry—An introduction to organic chemistry with applications to industrial pollution problems.

CHSC 3320 (CHSC 320) Unit Project 1—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 3341 (CHSC 341) Unit Operations 1—Fluid flow in piping systems; thermodynamic properties of steam; introduction to entropy; thermodynamic gas processes; compressors; psychrometric properties of air; introduction to cooling towers; flow of heat by conduction, convection and radiation; heat transfer coefficients; heat exchangers. Principles and application of equipment for evaporation, distillation, absorption and liquid-liquid extraction. Application of principles to problem-solving is emphasized throughout the course.

CHSC 3346 (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 3413 (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 3448 (CHSC 448) Industrial Chemistry 2—A survey course covering major chemical process industries. Lecture material is selected from the following topics: chlorine and caustic production, metal refining, material and energy balances, mineral processing.

CHSC 4408 (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 4411 (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 4412 (CHSC 412) Waste Management—Physical, biological and chemical methods used in treating municipal and industrial waste waters. Major industrial techniques for control of air pollutants are discussed. The remediation of contaminated soil sites is also covered.

CHSC 4420 (CHSC 420) Unit Project 2—See CHSC 3320.

CHSC 4421 (CHSC 421) Pulp and Paper Project—A project relating to the pulp and paper industry is chosen by each student with assistance from faculty advisors. The project involves both reading and laboratory research. Regular written progress reports and a final report are required. Prerequisite: CHSC 3320, 3346.

CHSC 4441 (CHSC 441) Unit Operations 2—See CHSC 3341.

CHSC 4446 (CHSC 446) Pulp and Paper—See CHSC 3346.

COMM 1135 (TCOM 101) Introduction to Technical Communication—This course covers basic writing and speaking skills needed for communicating technical information in industry. Students complete writing assignments which are specially prepared for Chemical Sciences Technology. They learn how to organize messages, illustrate documents, define and describe mechanisms and processes, and write memos, letters, and instructions. They also prepare and deliver oral presentations.

COMM 2241 (TCOM 202) Technical Communication for Chemical Sciences—Students write a resume and job application letter, and prepare for job interviews. They write several short reports, do primary and secondary research to prepare a proposal, practise effective meeting strategies, and give a persuasive oral presentation. Prerequisite: COMM 1135.

ELEX 2830 (ELEC 254) Process Measurement—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 1411 (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 formuli, trigonometric equations, and inverse functions.

MATH 2411 (MATH 230) Calculus for Chemical Sciences—Delta Process. The derivative. Differentiation rules. Applied maximum/minimum and error analysis. Integration. Indefinite and definite integral. Area under a curve. Volume of solids of rotation.

MATH 2412 (MATH 231) Statistics for Chemical Sciences—Organization and graphical presentation of data. Frequency distributions. Measures of central tendency and variation. Introduction to concepts of probability theory. Random variables. Probability distributions. The normal distribution. Sampling, estimation, and basics of hypothesis testing for means and proportions.

MATH 3411 (MATH 341) Numerical Methods 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.

MECH 1800 (MECH 102) Interpretation of Technical Drawing—Introduces students to engineering drawings as a method of communication. Students will learn how to read various types of engineering drawings and how to communicate using drawings. Emphasis is on visualization, dimensioning and freehand sketching.

MINE 4154 (MINE 454) Mining Industry for Extractive Metallurgy—An introduction to mineral and rock identification, nature of ore bodies, mining methods.

PETR 4403 (PETR 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 1141 (PHYS 114) Physics: Chemical Sciences 1—The first term of this introductory level course covers mechanics and wave motion. Mechanics topics include kinematics, vectors, dynamics, energy and circular motion. Wave motion topics include simple harmonic motion, general waves, sound and light. Mathematical treatment requires the use of algebra and trigonometry. The accompanying lab program stresses measurement, data analysis, experimental technique and report writing.

PHYS 2141 (PHYS 214) Physics: Chemical Sciences 2—The second term of this introductory level course covers electricity and magnetism, heat, fluid mechanics and nuclear physics. Electricity and magnetism include electrostatics, DC circuits, magnetic fields, magnetic induction, AC circuits and semiconductors. Heat includes heat and temperature, heat transfer, ideal gases and thermodynamics. Fluid mechanics includes hydrostatics and hydrodynamics. Mathematical treatment and lab procedures are continuations from the first term. Prerequisite: PHYS 1141.

Faculty and Staff

J.T. Neilson, B.A.Sc., P.Eng., Associate Dean
W.R. Irvine, B.A., M.Sc., P.Eng.
S. Berghold
J. Berry, B.Sc., Ph.D., Program Head
R. Drouin, Dipl.T.
D.J. McLeod, A.R.M.T.C., A.I.M.
T. Malakoff, Dipl.T.
T. Voksepp, B.A.Sc., P.Eng.
E. Woo, Dipl.T.

Advisory Committee Members

P. Stoddart, Workers' Compensation Board, Chair
P. Beauchemin, Chem-Security Ltd.
N. Brodie, Powertech Labs. Inc.
W. Deverall, Analytical Service Laboratories
D. Dixon, Quanta Trace Laboratories Inc.
A. Donkelaar, NLK-Celpac
S. A. Heimburger, FMC of Canada Ltd.
P. Mussallem
W. Soper, Westcoast Energy Ltd.
A. Strang, Howe Sound Pulp & Paper Ltd.

CIVIL AND STRUCTURAL TECHNOLOGY

Diploma Program

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, test lab technicians, design detailers and investigation and construction technologists, in government and in private industry. A number of graduates have founded their own consulting and construction businesses. Others are project managers and supervisors in engineering, contracting, surveying or architectural companies, or work in design or analysis.

The Program

This diverse and stimulating diploma 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 and structural technology. These include Geotechnical/Highways, Water Resources, Construction and Structures.

Program Length

Two years full-time beginning in September each year.

Total Fees (subject to change—does not include book or supply costs)

$3,965.30 for the two-year program (1993/94).

Degree Transfer/Completion

Graduates of the Civil and Structural Program, with 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 high academic standing also obtain good transfer credits to other Canadian Universities such as the University of Waterloo and the University of Calgary.

Accreditation

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

High school graduation with English 12, Math 12 and Physics 11 are course requirements for this program. Preference will be given to applicants who have a C grade or better in the prerequisites.

Exemption from the academic requirements may be made in the case of mature applicants with appropriate practical experience.

Program: CIVIL AND STRUCTURAL

Level 1			Clrm Hrs/wk
CIVL	1000	Statics	6.0
CIVL	1001	Graphical Communication 1	2.0
CIVL	1040	Hydrology	3.0
CIVL	1080	Concrete Technology	3.0
COMM	1135	Introduction to Technical Communication	3.0
MATH	1421	Basic Technical Mathematics for Civil & Structural	5.0
PHYS	1142	Physics for Civil & Structural 1	5.0
SURV	1130	Surveying for Civil & Structural 1	3.0

Level 2A (10 weeks)			
CIVL	2002	Stress Analysis	6.0
CIVL	2003	Graphical Communication 2	2.0
CIVL	2004	Civil Computer Applications	3.0
CIVL	2041	Hydraulics 1	3.0
COMM	2242	Technical Communication for Civil & Structural	3.0
MATH	2421	Calculus for Civil & Structural	5.0
PHYS	2142	Physics for Civil & Structural 2	5.0
SURV	2230	Surveying for Civil & Structural 2	3.0

Level 2B (10 weeks)			
CIVL	2003	Graphical Communication 2	2.0
CIVL	2004	Civil Computer Applications	3.0
CIVL	2041	Hydraulics 1	3.0
CIVL	2160	Elementary Structural Design	6.0
COMM	2242	Technical Communication for Civil & Structural	3.0
MATH	2421	Calculus for Civil & Structural	5.0
PHYS	2142	Physics for Civil & Structural	5.0
SURV	2230	Surveying for Civil & Structural 2	3.0

Second Year Program Options:

Set A—Geotechnical/Highways
Set C—Water Resources
Set D—Construction
Set E—Structures

Set A: GEOTECHNICAL HIGHWAYS

Level 3 (15 weeks)			Clrm Hrs/wk
CIVL	3006	Highway Design	6.0
CIVL	3042	Hydraulics 2	3.0
CIVL	3082	Soil Mechanics 1	6.0
CIVL	3164	Structural Design General	6.0
COMM	3342	Advanced Technical Communication for Civil & Structural	2.0
MATH	3421	Calculus 2 and Linear Algebra	4.0
SURV	3330	Surveying for Civil & Structural 3	3.0

Level 4A (10 weeks)			
CIVL	3007	AutoCAD 1 for Civil Engineering	3.0
CIVL	3120	Subdivision Planning	3.0
CIVL	3121	Urban Street Design	3.0
CIVL	4008	Civil Engineering Construction	3.0
CIVL	4009	Construction Contract Law	1.0
CIVL	4020	Projects	3.0
CIVL	4083	Soil Mechanics 2	6.0
COMM	4442	Advanced Technical Communication for Civil & Structural	2.0
MATH	4421	Statistics for Civil & Structural	3.0
SURV	4430	Surveying for Civil & Structural 4	3.0

Level 4B (10 weeks)			
CIVL	2081	Asphalt Technology	3.0
CIVL	4008	Civil Engineering Construction	3.0
CIVL	4009	Construction Contract Law	1.0
CIVL	4020	Projects	3.0
CIVL	4084	Soil Mechanics 3	6.0
CIVL	4122	Municipal Services	6.0
COMM	4442	Advanced Technical Communication for Civil & Structural	2.0
MATH	4421	Statistics for Civil & Structural	3.0
SURV	4430	Surveying for Civil & Structural 4	3.0

Set C: WATER RESOURCES

Level 3 (15 weeks)			Clrm Hrs/wk
CIVL	3006	Highway Design	6.0
CIVL	3042	Hydraulics 2	3.0
CIVL	3082	Soil Mechanics 1	6.0
CIVL	3164	Structural Design General	6.0
COMM	3342	Advanced Technical Communication for Civil & Structural	2.0
MATH	3421	Calculus 2 and Linear Algebra	4.0
SURV	3330	Surveying for C & S 3	3.0

Level 4A (10 weeks)			
CIVL	3120	Subdivision Planning	3.0
CIVL	3121	Urban Street Design	3.0
CIVL	4008	Civil Engineering Construction	3.0
CIVL	4009	Construction Contract Law	1.0
CIVL	4020	Projects	3.0
CIVL	4043	Water Resources	3.0
CIVL	4083	Soil Mechanics 2	6.0
COMM	4442	Advanced Technical Communication for Civil & Structural	2.0
MATH	4421	Statistics for Civil & Structural	3.0
SURV	4430	Surveying for Civil & Structural 4	3.0

Level 4B (10 weeks)			
CIVL	2081	Asphalt Technology	3.0
CIVL	3007	AutoCAD 1 for Civil Engineering	3.0
CIVL	4008	Civil Engineering Construction	3.0
CIVL	4009	Construction Contract Law	1.0
CIVL	4020	Projects	3.0
CIVL	4043	Water Resources	3.0
CIVL	4122	Municipal Services	6.0
COMM	4442	Advanced Technical Communication for Civil & Structural	2.0
MATH	4421	Statistics for Civil & Structural	3.0
SURV	4430	Surveying for Civil & Structural 4	3.0

Set D: CONSTRUCTION

Level 3 (15 weeks)			
CIVL	3005	Highway Design Basic	3.0
CIVL	3007	AutoCAD 1 for Civil Engineering	3.0
CIVL	3042	Hydraulics 2	3.0
CIVL	3120	Subdivision Planning	3.0
CIVL	3161	Structures 1	3.0
CIVL	3164	Structural Design General	6.0
COMM	3342	Advanced Technical Communication for Civil & Structural	2.0
MATH	3421	Calculus 2 and Linear Algebra	4.0
SURV	3330	Surveying for Civil & Structural 3	3.0

Level 4A (10 weeks)			Clrm Hrs/wk
CIVL	3082	Soil Mechanics 1	6.0
CIVL	4008	Civil Engineering Construction	3.0
CIVL	4009	Construction Contract Law	1.0
CIVL	4020	Projects	3.0
CIVL	4162	Structures 2	6.0
COMM	4442	Advanced Technical Communication for Civil & Structural	2.0
MATH	4421	Statistics for Civil & Structural	3.0
OPMT	1180	Construction Mgt 1	3.0
SURV	4430	Surveying for C & S 4	3.0

Level 4B (10 weeks)			
CIVL	2081	Asphalt Technology	3.0
CIVL	4008	Civil Engineering Construction	3.0
CIVL	4009	Construction Contract Law	1.0
CIVL	4122	Municipal Services	6.0
CIVL	4166	Structural Detailing	3.0
COMM	4442	Advanced Technical Communication for Civil & Structural	2.0
MATH	4421	Statistics for Civil & Structural	3.0
SURV	4430	Surveying for Civil & Structural 4	3.0

Set E: STRUCTURES

Level 3 (15 weeks)			
CIVL	3005	Highway Design Basic	3.0
CIVL	3007	AutoCAD 1 for Civil Engineering	3.0
CIVL	3042	Hydraulics 2	3.0
CIVL	3120	Subdivision Planning	3.0
CIVL	3121	Urban Street Design	3.0
CIVL	3161	Structures 1	6.0
COMM	3342	Advanced Technical Communication for Civil & Structural	2.0
MATH	3421	Calculus 2 and Linear Algebra	4.0
SURV	3330	Surveying for Civil & Structural 3	3.0

Level 4A (10 weeks)			
CIVL	3082	Soil Mechanics 1	6.0
CIVL	4008	Civil Engineering Construction	3.0
CIVL	4009	Construction Contract Law	1.0
CIVL	4020	Projects	3.0
CIVL	4162	Structures 2	6.0
COMM	4442	Advanced Technical Communication for Civil & Structural	2.0
MATH	4421	Statistics for Civil & Structural	3.0
OPMT	1180	Construction Management 1	3.0
SURV	4430	Surveying for Civil & Structural 4	3.0

Level 4B (10 weeks)			
CIVL	2081	Asphalt Technology	3.0
CIVL	4008	Civil Engineering Construction	3.0
CIVL	4009	Construction Contract Law	1.0
CIVL	4083	Soil Mechanics 2	6.0
CIVL	4163	Structures 3	6.0
CIVL	4166	Structural Detailing	3.0
COMM	4442	Advanced Technical Communication for Civil & Structural	2.0
MATH	4421	Statistics for Civil & Structural	3.0
SURV	4430	Surveying for Civil & Structural 4	3.0

Course Descriptions

CIVL 1000 (CIVL 101) Statics—This foundation course in mechanics provides a thorough introduction to the relationship between applied loads and resultant forces for statically determinate members and structures. Lectures are combined with closely supervised problem sessions. Topics include vector analysis, force systems, freebody diagrams, equilibrium, force/pressure relationships, elementary hydrostatics, analytical method of joints and method of sections for truss analysis, machines, pinned plane frame analysis, shear force and bending moment diagrams for trapezoidal loading, and section properties for built-up sections.

CIVL 1001 (CIVL 108) Graphical Communication 1—This first course will begin with the tracing of drawings with emphasis on line-work, lettering and dimensioning. More difficult assignments involving re-drawing details to new scale ratios will be introduced as your skills increase. Drawing layout, overall presentation and completeness of information will complete this fundamental course. Consideration will be given to consistency of line-work and lettering rather than speed. In the two follow-up terms, speed will become more important. Terminology related to many aspects of civil engineering will be introduced during the lecture sessions.

CIVL 1040 (CIVL 103) Hydrology—This introductory course presents the basic concepts and techniques needed for watershed analysis and drainage facility design. Fundamental concepts include rainfall intensity, runoff, catchment area, streamflow, mass balance, snowmelt, flood frequency and the hydrologic cycle. The streamflow estimation procedures presented are the rational method, unit hydrograph and flood frequency analysis. Course content is reinforced through assigned reading, lectures and problem-solving. Basic observation and estimation skills are developed through field assignments or a small field project.

CIVL 1080 (CIVL 109) Concrete Technology—Provides the knowledge required to select suitable materials for making quality concrete; design a concrete mix for strength, workability and economy; sample and conduct quality control tests on concrete and aggregates. Students will understand the theory and practices used in concrete manufacturing and construction. Topics include cements, water/cement ratio, admixtures, concrete properties manufacturing, transportation, placing, finishing, curing, CSA code A23. 1 and 2 Inspection Techniques.

CIVL 2002 (CIVL 202) Stress Analysis—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 1000.

CIVL 2003 (CIVL 208) Graphical Communication 2—This course builds on the material given in its prerequisite, CIVL 1001, and continues in much the same manner. As in CIVL 1001, examples will be drawn from the civil, structural and architectural fields, but more emphasis will be placed on speed and layout as the course progresses. The principal focus of this portion of the course is to accelerate the student's transfer of knowledge from sketches to final drawings. Presentation and comprehension of material will also continue to be stressed, particularly line quality and lettering. Prerequisite: CIVL 1001.

CIVL 2004 (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 databases. Highway terminology—horizontal/vertical curves. Introduction to Canadian Standards. Prerequisite: CIVL 1000, MATH 1421.

CIVL 2041 (CIVL 207) Hydraulics 1—Prepares students to analyze and design pipe-pump systems for water distribution and other purposes, and to analyze the hydrostatic forces on fixed or floating structures. Topics include fluid properties, hydrostatic pressure and forces, buoyancy and stability of floating and submerged objects, continuity,

Bernoulli's equation, energy and hydraulic grade lines, head losses, pump characteristics and selection, cavitation, and basic cost analysis for pipe-pump systems. Topics are taught using lectures, reading, problems and, if possible, laboratory exercise. Prerequisite: CIVL 1000.

CIVL 2081 (CIVL 410) Asphalt Technology—After successfully completing this introductory course, a student will be able to select suitable materials for asphaltic concrete design using the Marshall method. Topics include plant and paving quality control, asphaltic cement testing, calculation for asphaltic design.

CIVL 2160 (CIVL 203) Elementary Structural Design—Having 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, are used as examples. Prerequisite: CIVL 2002.

CIVL 3005 (CIVL 419) Highway Design Basic—Students will prepare preliminary drawings and a design brief for an actual project in B.C. Students will choose an alignment within a corridor and design spiralled curves and a preliminary alignment. Curves will be suitably superelevated. Students will select an appropriate typical section. Existing ground and proposed alignment data will be input into a computer earthworks program. Input files will be adjusted interactively with this program in order to achieve an earthworks balance. The resulting mass haul diagram will be analyzed. Students will prepare a report or series of short reports at various stages during the course.

CIVL 3006 (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 2041, 2004.

CIVL 3007 (CIVL 383) AutoCAD 1 for Civil Engineering—(1) Basic CADD commands for controlling elements, views, drawings and files. (2) Project using this 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 1000, 2004.

CIVL 3042 (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 2041.

CIVL 3082 (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. Prerequisite: CIVL 1000, 2041.

CIVL 3120 (CIVL 315) Subdivision Planning—Provides the student with an understanding of the planning concepts and restraints for subdivision development at the municipal/city level. Sections of the Municipal Act and local bylaws are reviewed to establish layout criteria, subdivision procedures and rezoning applications. Consideration will also be given to the engineering requirements and concerns of external approving agencies. In preparing an actual subdivision plan, the student will be evaluated based on the city, developer and engineers view points, complete with a preliminary cost analysis.

CIVL 3121 (CIVL 314) Urban Street Design—Through a review of the urban street classification system, the student will determine the basic requirements of a road right-of-way and its relationship to other utilities. In preparing the design of a major road, it will be necessary to understand both vertical and horizontal design elements and the use of cross-sections to correlate these design controls. The concepts of road drainage, intersection design, sidewalks, channelisation and drawing preparation will be discussed. A review of the design process, extent of field information, legal surveys and the preparation of as-constructed drawings will conclude the course.

CIVL 3161 (CIVL 322) Structures 1—Structural analysis of statically indeterminate structures is introduced using the method of moment distribution. Later, computer methods of structural analysis are illustrated by using the computer program PFRAME. Reinforced concrete design includes design for flexure, shear, deflection and axial loads. Students prepare a reinforced concrete design project which includes preliminary design, structural analysis, design of beams and columns, preparation of engineering drawings, and detailing of reinforcement. Prerequisite: CIVL 2160.

CIVL 3164 (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 2160.

CIVL 4008 (CIVL 435) Civil Engineering Construction—The organization, cost and sequence of construction activities for a typical civil engineering project are all interrelated. This course will examine aspects of overall planning, scheduling and cost estimating. Your introduction to basic types of construction equipment and their use will be further illustrated by construction videos and films. A typical construction project will be used as the basis of in-class exercises and assignments for plan reading, quantity take-offs, estimating costs and scheduling. Various techniques for scheduling construction activities and establishing precedence diagrams will be demonstrated and the critical path(s) analysis of activities determined.

CIVL 4009 (CIVL 460) Construction Contract Law—This is a preliminary course in the area of contract administration. It will introduce the student to the three major types of construction contracts, their specific applications and the contractual relationships between the various parties. The contents of a typical contract document, bonding and claims will be discussed and illustrated through the use of construction scenarios. Prerequisite: COMM 2242.

CIVL 4020 (CIVL 499) Projects—The objective of this course is to allow students to make contacts with the civil engineering/construction industry and, in conjunction with a company, develop a project. The project should involve the investigation of a current and relevant problem for the company. Interim progress reports should provide full details of the investigation, conclusions and recommendations. Prerequisite: COMM 2242.

CIVL 4043 (CIVL 416) Water Resources—Through lectures, problem sessions and field assignments, the student is introduced to a wide range of water resource problems, methods of analysis and solutions. Topics include drainage, flood control, hydroelectric power generation, well hydraulics, irrigation, water supply, sewage, sewerage and coastal engineering. In addition to basics from the course prerequisites, the fundamentals of sedimentation, detention, engineering economics, hydraulic modelling and numerical solution techniques are reviewed. Prerequisite: CIVL 1041, 3042.

CIVL 4083 (CIVL 426) Soil Mechanics 2—This course applies the knowledge learnt in CIVL 3082 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 3082.

CIVL 4084 (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 4083.

CIVL 4122 (CIVL 412) Municipal Services—This course is intended to complement the Subdivision Planning and Urban Street Design courses. The student will prepare detail designs for storm and sanitary sewers together with the analysis of the watermain distribution network for a residential subdivision layout. The application of current design criteria to each of these designs together with the complete terminology of the appurtenances used, will prepare the student for careers in either design or construction of the municipal infrastructure. Computer programs will also be used to check design tabulations for sanitary sewers and for the analysis of the water distribution system. Emphasis will be placed on the preparation of plan and profile drawings for the design sections, together with all calculations and design tabulations to meet industry standards. Prerequisite: CIVL 2041.

CIVL 4162 (CIVL 423) Structures 2—Through analysis and design projects, students continue to achieve appreciation and understanding of structures. Emphasis is placed on formwork design, prestressed concrete and reinforced masonry. 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 3161 or 3164.

CIVL 4163 (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 4162.

CIVL 4166 (CIVL 434) Structural Detailing—Students are required to design connections for structural steel beams, columns, and bracing, and to produce the required drawings for steel fabrication.

COMM 1135 (TCOM 101) Introduction to Technical Communication—This course covers basic writing and speaking skills needed for communicating technical information in industry. Students learn how to organize messages, illustrate documents, define and describe mechanisms and processes, and write memos, letters and instructions. Students also prepare and deliver oral presentations.

COMM 2242 (TCOM 203) Technical Communication for Civil & Structural—Students will write job application letters and resumes and learn about job interviews. They write short progress, incident, trip and inspection reports common to the Civil and Structural field. They also practice oral reporting. Prerequisite: COMM 1135.

COMM 3342 (TCOM 302) Advanced Technical Communication for Civil & 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: COMM 1135, 2242.

COMM 4442 (TCOM 401) Advanced Technical Communication for Civil & Structural—In this course, students continue to practise 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: COMM 1135, 2242, 3342.

MATH 1421 (MATH 142) Basic Technical Mathematics for Civil & Structural—Review of basic algebra. Solution of equations and systems of equations. Trigonometry, vectors, radian measure. Irregular areas and volumes. Variations. Logarithms and solution of logarithmic and exponential equations.

MATH 2421 (MATH 242) Calculus for Civil & Structural—Straight line, log graphs and the conic sections. Limits, derivatives of algebraic and transcendental functions. Application of derivatives. Indefinite and definite integrals. Calculation of areas, volumes. Solution of the differential equations of beams with distributed loads.

MATH 3421 (MATH 342) Calculus 2 and Linear Algebra—Calculating moments, centroids and moment of inertia. Fluid pressure. Matrix algebra. Solution of system of equations using matrices. Determinants. Linear programming using simplex. Duality theorem.

MATH 4421 (MATH 442) Statistics for Civil & Structural—Organization and graphical presentation of data. Elements of probability. Discrete and continuous probability distributions. Estimating. Testing of hypothesis. The Weibull distribution. Flood frequency analysis.

OPMT 1180 (OPMT 180) Construction Management 1—The purpose of this course is to provide students with an appreciation of common financial business practice. This will be demonstrated through different types of business ownership, the relationship between business and the economy and the need for and sources of capital. Principles of engineering economics and accounting will be used to illustrate the monetary and interest related forms of economic evaluation.

PHYS 1142 (PHYS 107) Physics for Civil & Structural 1—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 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 and nuclear phenomena. The lab program stresses measurements, data analysis and experimental techniques.

PHYS 2142 (PHYS 207) Physics for Civil & Structural 2—See PHYS 1142. Prerequisite: PHYS 1142.

SURV 1130 (SURV 130) Surveying for Civil & Structural 1—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 2230 (SURV 230) Surveying for Civil & Structural 2—See SURV 1130.

SURV 3330 (SURV 330) Surveying for Civil & Structural 3—See SURV 1130.

SURV 4430 (SURV 430) Surveying for Civil & Structural 4—See SURV 1130.

Faculty and Staff

D.C. Deans, B.A., Associate Dean
T. Abbuhl, Dipl.T., A.Sc.T.
A.R. Barren, B.Sc., Ph.D., P.Eng., Program Head
R.B. Brown, Dipl.T., A.Sc.T.
B. Butler, M.I.C.E., M.I. Struct E., C.Eng., P. Eng.
P. Cunnington, B.Sc., P. Eng.
M.J. Heinekey, B.Tech., Dipl.T., Dipl. Adult Ed., M.B.A., A.Sc.T.
J. McLean, B.Ed., A.Sc.T.
C. Niwinski, M.A. Sc., P. Eng.
C.A. Payne, B.A.Sc., M.A.Sc., P.Eng.
E. Reid, M.I.C.E., C.Eng., P.Eng.
R.C. Starr, B.Eng., M.A.Sc., P.Eng., Chief Instructor

Civil & Structural Technology Advisory Committee

T. Mulder, P. Eng., City of Vancouver (Chairman)
N. Atchison, P. Eng., District of Surrey
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R. Chapman,P. Eng., Ministry of Transportation and Highways
B. Conlin, P. Eng., Golder Associates Ltd.
K. Fyvie, A. Sc. T., Terra Engineering Ltd.
D. Halliday, A. Sc. T., Coast Steel Fabricators
W. Kyle, P. Eng., District of Surrey
C. Sinclair, P. Eng., Corporation of Burnaby
T. Pataky, P. Eng., B.C. Hydro
B. Wallace, P. Eng., N.D. Lea Consultants Ltd.

COMPUTER SYSTEMS TECHNOLOGY

Diploma Program

Computers are used to store, manipulate, analyze and display vast quantities of information in unlimited combinations of text, images and sound. Information technology is increasingly used in science, industry, health, business, and the arts as a creative and analytical tool. Large mainframe computers, medium-sized minicomputers and desktop personal computers are commonly used tools, and increasingly connect with communications networks spanning vast distances. Systems analysts define the problem to be solved and design solutions. Programmers give the computer a detailed set of instructions (called a program) to implement the design. These functions are often combined into one job—the Analyst/Programmer. The human element is critical to the success of any computer application.

Job Opportunities

Many graduates begin their careers as junior programmers or junior analyst/programmers and, after some experience, are promoted to programmers, systems analysts, knowledge engineers, programmer/analysts or operating systems programmers. Others seek entrepreneurial roles in the computer world as independent business owners, software authors, consultants, or suppliers of systems and equipment. Career opportunities exist in such areas as management, software and hardware sales, technical writing, training others on computers, consulting, knowledge engineering, software development and technical support.

Application areas include transaction processing (such as order processing, airline reservations, banking systems), accounting functions, sales analysis, forecasting and simulation, database management, engineering, decision support and communications.

The Program

The first year of the program is a mix of computer-related and general business courses. The computer-related courses use mainframe and microcomputers to introduce: standard techniques of programming using Pascal, C, and COBOL languages; the use of software packages covering word processing, spreadsheets and databases; systems analysis and design. The general business courses include accounting, economics, mathematics, statistics and communications.

In the second year, students specialize in one of the options listed below. Most options are limited in size to about 20 students. Where the number of applicants exceeds the available seats, students are placed using a weighted average of first-year marks.

Second Year Options

Data Communications Systems: Offers specialized courses in the rapidly expanding data communications and computer networking field. Students design and develop programs to implement protocol drivers, file transfer protocols and LAN applications. UNIX and MS-DOS operating systems are used in depth. Students are given a working knowledge of UNIX networking tools such as TCP/IP and UUCP. Computer simulation and modelling techniques are used to analyze the throughput performance of networks.

Decision Systems: Specializes in scientific systems and computer modelling to assist in decision-making. Topics include: UNIX, computer simulation, expert systems, optimization, computer graphics, GIS, OOPL and C++.

Expert Systems: Specializes in the branch of Artificial Intelligence that 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: Provides a specialization involving system development in the information processing environment, with special emphasis on management information systems (MIS) and software engineering for medium and large computer systems.

Microcomputer Systems: Specializes in microcomputer technology, microcomputer systems programming, micro-based systems design and micro applications software, including networks and graphical user interface systems.

Program Length

Two years full-time beginning in September each year.

Total Fees (subject to change—does not include book or supply costs)

$3,965.30 for the two-year program (1993/94).

Prerequisites

Candidates are evaluated on an individual basis. We encourage applications from all interested persons regardless of their formal prerequisites. All applicants are required to attend a Computer Systems information session and then submit a portfolio which includes a resume, a covering letter describing their background and their expectations, and official transcripts showing completion of the minimum requirements. The minimum requirements are: English 12, Math 12, and Computer Science 12 all with C+ or proof of equivalent competency. Information session dates are available at Student Services, 434-3304.

Second-Year Direct Entry

Qualified applicants are accepted for direct entry into the second year of the program provided they have completed the equivalent of the first year of the program. First-year equivalency may be obtained through any combination of courses from other post secondary institutions, BCIT part-time courses and, in some cases, work experience. Direct Entry applicants should apply well in advance since seat availability is limited, and should consult with the C.S.T. Diploma Program Coordinator to ensure they meet equivalency standards.

Accreditation

The Computer Systems Technology two-year Diploma Program has been accredited by the Canadian Information Processing Society (C.I.P.S.) and by the Data Processing Managers Association (D.P.M.A.).

Advanced Diploma/ Bachelor of Technology

In addition to the two-year Computer Systems Technology diploma program, an Advanced Diploma in Computer Systems Technology is offered through Part-time Studies. A Bachelor of Technology (Computer Systems) is also offered by the Open Learning Agency in collaboration with BCIT. For details, please contact the School of Engineering, Part-time Studies department.

Additional Information

Applicants should enjoy using a logical and systematic approach in solving problems. Because students spend many hours at computer terminal keyboards, we strongly recommend that they be able to touch type. Ownership of a suitable personal computer is required. Consult the department for specification details.

The Computer Systems curriculum is under continual review to ensure currency. Current courses may therefore vary from this calendar. New course information may be obtained from the Computer Systems Technology office or from Student Services.

Program: COMPUTER SYSTEMS

Level 1		Clrm Hrs/wk
COMM 1114	Business Communication for Computer Systems	3.0
COMP 1000	Enhanced Learning Skills	1.0
COMP 1510	Programming Methods	6.0
COMP 1710	Computer Applications Fundamentals	6.0
ECON 1150	Economic Issues	3.0
FMGT 1100	Accounting 1	4.0
MKTG 1102	Essentials of Marketing	3.0
OPMT 1113	Applied Mathematics	4.0

Level 2		Clrm Hrs/wk
COMM 2214	Business Communication for Computer Systems	4.0
COMP 2510	Programming in C	4.0
COMP 2520	Programming in COBOL	4.0
COMP 2710	Systems Analysis and Design	5.0
COMP 2720	Computer Organization/Architecture	4.0
FMGT 2100	Accounting 2	4.0
OPMT 1133	Statistics in Industry	4.0

Level 3		Info	Dec	Micro	DCom	Exp
COMP 2750	Intro to Decision Systems	3	3	3	3	3
COMP 3510	Applications Programming C/PC Assembler	-	6	6	6	6
COMP 3520	Applications Programming Cobol/Assembler	6	-	-	-	-
COMP 3710	Relational Databas Systems	4	4	4	4	4
COMP 3720	Intro to Data Communications	3	3	3	3	3
COMP 3900	Computer Projects 1	5	5	5	5	5
COMP 3910	Software Engineering	5	-	-	-	-
COMP 3930	Decision Systems 1	-	5	-	-	-
COMP 3950	Micro Systems andApplications 1	-	-	5	-	-
COMP 3970	Expert Systems 1	-	-	-	-	5
COMP 3990	Data Communications/Networks 1	-	-	-	5	-
ELEX 2865	Introduction to Computer Hardware	-	4	4	4	4
ORGB 2110	Organizational Behavior	3	-	-	-	-

Level 4A (first 10 weeks of the term)		Info	Dec	Micro	DCom	Exp
BLAW 3600	Computers and the Law	3	3	3	3	3
COMP 3730	Operating Systems Concepts	5	5	5	5	5
COMP 4520	Applications Programming PL/1, CICS	4	-	-	-	-
COMP 4550	Advanced Programming Topics: OOPL	6	6	6	6	6
COMP 4900	Computer Projects 2	5	5	5	5	5
COMP 4910	Selected MIS topics	4	-	-	-	-
COMP 4930	Decision Systems 2	-	8	-	-	-
COMP 4950	Micro Systems and Applications 2	-	-	8	-	-
COMP 4970	Expert Systems 2	-	-	-	-	8
COMP 4990	Data Communications/Networks 2	-	-	-	8	-

Level 4B (second 10 weeks of the term)		Info	Dec	Micro	DCom	Exp
BLAW 3600	Computers and the Law	3	3	3	3	3
COMP 4520	Applications Programming PL/1, CICS	4	-	-	-	-
COMP 4530	AS/400 Principles of Operation	4	-	-	-	-
COMP 4540	AS/400 Programming (RPG)	4	-	-	-	-
COMP 4560	Advanced Programming Topics	-	6	6	6	6
COMP 4710	Software Engineering/CASE	4	4	4	4	4
COMP 4730	Operating Systems Applications	-	5	5	5	5
COMP 4900	Computer Projects 2	5	5	5	5	5
COMP 4910	Selected MIS topics	4	-	-	-	-
COMP 4930	Decision Systems 2	-	8	-	-	-
COMP 4950	Micro Systems and Applications 2	-	-	8	-	-
COMP 4970	Expert Systems 2	-	-	-	-	8
COMP 4990	Data Communications/Networks 2	-	-	-	10.5	-

Course Descriptions

BLAW 3600 (ADMN 483) Computers and the Law—Gives the student basic knowledge of Canadian law with emphasis on how the law affects those in the computer industry. The course includes the law of tort, contracts, sale of goods, secured transactions, employment, intellectual property, partnerships and companies.

COMM 1114 (BCOM 103) Business Communication for Computer Systems—Teaches basic communication theory and the principles of effective business writing.

Students apply these principles to informational and persuasive memos and letters. The term includes an informational oral presentation. Assignments are specific to the computer industry.

COMM 2214 (BCOM 203) Business Communication for Computer Systems—Continues COMM 1114. This course teaches strategies for writing a variety of informational and analytical reports, getting a job, interviewing clients, holding productive meetings, and making persuasive oral presentations. The term includes a 15-hour block on effective and readable manuals for the end-users of computer systems and programs. The major assignment for the term involves an oral and written proposal to clients for a new system. Prerequisite: COMM 1114.

COMP 1000 (COMP 152) Enhanced Learning Skills—Assists new Computer Systems students in increasing their success at BCIT. The course covers skills in retention, time management, reading, test taking, note taking, report writing, oral presentation and planning.

COMP 1510 (COMP 154) Programming Methods—Complements COMP 1710 and is a prelude to all future systems and programming courses. The course introduces modern principles of programming methodologies. Students are taught to write programs that are readable, well structured, and easy to maintain. Standard data structures and algorithms are introduced.

COMP 1710 (COMP 174) Computer Applications Fundamentals—Addresses computer fundamentals and personal productivity. Opens with a review of computer literacy basics (hardware and software). Addresses basic productivity tools such as MS-DOS, text editing, word processing, spreadsheets, database management, and communications. Covers business information systems, particularly the key operations and standard financial applications. Introduces the student to advanced productivity tools: time management, desktop publishing and power programming. Includes extensive hands-on lab work on both the PC and the mainframe, related to lecture material.

COMP 2510 (COMP 257) Programming C—Studies the philosophy of C as the basis of explaining the apparent power and freedom in C programming. Basic C syntax, input/output, functions and advanced data structures are covered. Pointers are studied in detail. The C environment and the concept of reusable functions are emphasized. Prerequisite: COMP 1510, 1710.

COMP 2520 (COMP 258) Programming in COBOL—Introduces the COBOL language. Uses the structured, modular programming techniques developed in COMP 1510 to solve practical business problems. Topics include subroutines, record and file processing, tables, business reports and data validation. Prerequisite: COMP 1510, 1710.

COMP 2710 (COMP 270) Systems Analysis and Design —Continues the material covered in COMP 1710. Areas include systems development life cycle, starting project, 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. Prerequisite: COMP 1510, 1710; FMGT 1100, COMM 1114, OPMT 1113.

COMP 2720 (COMP 252) Computer Organization/Architecture—Examines in detail the workings of PC DOS and the way the system interfaces with users, application languages and hardware. The components of a microcomputer, including CPU characteristics, memory addressing, and instruction sets are studied. The course also introduces assembly language and debugging issues. Focuses on direct control of microcomputer devices. Prerequisite: COMP 1510, 1710.

COMP 2750 (COMP 280) Introduction to Decision Systems—Gives 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. Prerequisite: OPMT 1133.

COMP 3510 (COMP 356) Applications Programming C/PC Assembler—Builds on previous programming courses. Explores algorithm, file organization, program and system development using the C language. Some emphasis is placed upon developing efficient systems (i.e., making best use of system resources). Examines alternative algorithms, profiling and tuning techniques, and the use of assembly language to improve performance. Prerequisite: COMP 2720, 2510.

COMP 3520 (COMP 350) Applications Programming Cobol/Assembler—Builds on previous programming courses. Covers programming languages pertinent to the student's option, with an emphasis on good programming style. Students write several programs incorporating a variety of programming techniques. Various popular platforms may be used in compiling the programs. Prerequisite: COMP 2510.

COMP 3710 (COMP 370) Relational Database Systems—Covers relational database technology, including basic characteristics; relational algebra; entity-relationship charts; data analysis and design; dependencies; anomalies and normalization; query languages (SQL); loading, retrieval and updating; data dictionary; creating and using views; report writer. Students design, load and update a relational database. Prerequisite: COMP 2710.

COMP 3720 (COMP 471) Intro to Data Communications—Covers basic concepts and terminology related to data communications and computer networking (DC/CN). Includes principles of DC/CN protocols at physical, datalink, and application theory related to data transmission to interconnect PC-based systems via serial and parallel ports, modems, mainframe emulators, and LAN's. Students write simple communications drivers, use available DC packages and evaluate this software. Prerequisite: COMP 2720, 2510.

COMP 3730 (COMP 352) Operating Systems Concepts—Covers topics related to the management of computer resources by an operating system (software) and supporting hardware. Topics include processor management and scheduling, memory management and input/output management. Prerequisite: COMP 2720, 2510, 2520.

COMP 3900 (COMP 392) Computer Projects 1—Allows students to work on projects of their choice within guidelines specified by faculty. The projects are drawn from a variety of sources, especially from industrial situations, and may require extensive contact with the business community. Students work in teams and seek advice from a faculty member acting as their project supervisor. Some of the projects continue through both terms, whereas others end in COMP 3900 and new ones start in COMP 4900. Prerequisite: COMM 2214, COMP 2720, 2510, 2520, 2710.

COMP 3910 (COMP 353) Software Engineering—Covers principles and techniques of software engineering including software life cycle models, productivity measures, planning and project control, software testing methods, specification methods, modularity constraints, design methods, implementation requirements, software maintenance, software portability and reusability. Prerequisite: COMM 1114, COMP 2710.

COMP 3930 (COMP 380) Decision Systems 1—The development of computer and non-computer models that 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.

Behavioral as well as quantitative aspects are emphasized. Feasibility studies, reports and presentations, are required throughout. Students develop programs in FORTRAN and C. Prerequisite: Successful completion of first year or permission of the instructor.

COMP 3950 (COMP 351) Micro Systems and Applications 1—Provides students with sound technical knowledge of the IBM PC and it's operating system, and a thorough knowledge of networks including setup, administration and NetBIOS programming. Students gain significant depth and breadth in a microcomputer software development environment and develop specific expertise in at least one significant applications package. Prerequisite: COMP 2720, 2510.

COMP 3970 (COMP 357) Expert Systems 1—Gives students proficiency in the LISP language for use as an Expert System development tool in COMP 4970. Once the basic syntax and features of the language have been covered, the course focuses on LISP application areas, in particular those suitable for Expert Systems work. Prerequisite: Successful completion of first year or permission of the instructor.

COMP 3990 (COMP 386) Data Communications/Networks 1—Covers the data communications topics Local Area Networks (theory, installation, administration); basic data communications programming (BIOS, handling serial interrupts, simple protocols); and data communications hardware. This course is required for the Data Communications Option. Prerequisite: Successful completion of first year CST or permission of the instructor.

COMP 4520 (COMP 460) Application Programming PL/1, CICS—Covers methodology that maximizes the value of developing systems by focusing on the strategic requirements of an organization. Information Engineering increases quality and productivity through the automation of the systems development tasks. Multiple tools such as CASE, 4GL, Interface Builders and Code Generators are used to accomplish this objective. Prerequisite: COMP 3710, 3910.

COMP 4530 (COMP 456) AS/400 Principles of Operation—Gives an overview of principles of AS/400 operation. Discusses AS/400 tools, utilities and design alternatives. Prerequisite: COMP 3730.

COMP 4540 (COMP 466) AS/400 Programming (RPG)—Covers AS/400 programming including CL language, RPG/400 batch and on-line programming, screen and file handling. Prerequisite: COMP 3520, or 3510.

COMP 4550 (COMP 461) Advanced Programming Topics: OOPL—Introduces the major principles behind the OOPL paradigm including data abstraction, class hierarchies and inheritance, encapsulation, message passing, polymorphism, etc. Students acquire experience with typical OOPL's such as Smalltalk, Actor, C++ and object-oriented extensions to popular microcomputer-based languages such as Pascal and C. Prerequisite: COMP 3520/3510

COMP 4560 (COMP 462) Advanced Programming Topics—Covers contemporary topics in programming pertinent to the student's option. Depending upon the option, it may cover specialty languages, advanced applications or advanced topics in programming. Prerequisite: COMP 3730/3510.

COMP 4710 (COMP 472) Software Engineering/CASE—Features software engineering practices and computer-aided software engineering (CASE). Includes the CASE software development environment; software methodologies; code generation; categories of CASE tools; implementation considerations; CASE software life cycle; software reusability; software re-engineering. Students develop a project using CASE software tools. Prerequisite: COMP 3710.

COMP 4730 (COMP 452) Operating Systems Applications—Provides hands-on experience at the operating system level, pertinent to the student's option. Depending on the option, topics may include exposure to the AS/400 or to Unix in a workstation environment (Sun). Prerequisite: COMP 3730 and permission of the instructor (as topics may change, consult program head).

COMP 4900 (COMP 492) Computer Projects 2—See COMP 3900. Prerequisite: COMM 2214,COMP 2720, 2510, 2520, 2710.

COMP 4910 (COMP 453) Selected MIS Topics—Covers current technology in Information Systems including management planning; computer resources; physical and data security; data compression; data encryption; benchmarks; introduction to data analysis and modelling. Students participate in case studies based on articles from current technical journals. Prerequisite: COMP 3910.

COMP 4930 (COMP 481) Decision Systems 2—Covers systems that 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 3930, behavioral 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. Prerequisite: COMP 3930.

COMP 4950 (COMP 451) Micro Systems and Applications 2—Addresses software development practices, and advanced software design and development in event-driven graphical user interface (GUI) environments (OS/2 and Windows). Prerequisite: COMP 3950, 3510.

COMP 4970 (COMP 457) Expert Systems 2—Stresses Expert Systems project development techniques. The PROLOG language is taught as the course progresses and students use LISP, PROLOG or Expert Systems shell packages to develop major projects. Prerequisite: COMP 3970.

COMP 4990 (COMP 486) Data Communications/Networks 2—Covers advanced data communications programming (Advanced Protocols, NetBIOS); network design and performance analysis; and UNIX programming for data communications. This course is required for the Data Communications option. Prerequisite: COMP 3990.

ECON 1150 (ADMN 101) Economic Issues—Enables students to critically assess current economic issues and policies in Canada. At the end of the course, students will understand the relationship of the major economic sectors: consumers, investment, government, financial institutions, and exports/ imports in the foreign sector. In particular, students will be informed on current events such as the Goods and Services Tax (GST) and Free Trade Agreement (FTA) in general and about the potential data gathering and analyses implicit for some industries because of these events.

ELEX 2865 (ELEC 261) Introduction to Computer Hardware—This course extends the student's knowledge of the C language by programming into an interface, activating both digital and analog I/O, and giving a concrete sense of ports, buffers, latches, decoding and memory. The course combines further exploration of the 8253 timer chip, the 8259 programmable interrupt controller, the 8250 UART and the keyboard, with the hands-on experience of installing both types of floppy drive and a hard drive. Prerequisite: COMP 2510, 2720.

FMGT 1100 (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 2100. 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 2100 (FMGT 201) Accounting 2—The follow-up to FMGT 1100, topics include notes and accounts receivable, long-lived assets, liabilities, partnerships and corporations, cash-flow, manufacturing accounting, management accounting, consolidated statements, and analysis of financial statements. Prerequisite: FMGT 1100.

MKTG 1102 (MKTG 102) Essentials of Marketing—Provides the student with an overview of the marketing concept and how it can be applied to any type of organization or service. Material includes the controllable and uncontrollable elements of marketing, strategy planning, market characteristics, marketing research techniques, market segmentation and target market selection.

OPMT 1113 (OPMT 113) Applied Mathematics—The first portion of the course includes positional numbering systems, binary arithmetic and an introduction to Boolean Algebra as it relates to operation of digital computers. The second phase reviews and applies the concepts of linear, quadratic and exponential functions, including logarithms. The third 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 1133 (OPMT 133) Statistics in Industry—Provides 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.

ORGB 2110 (ADMN 220) Organizational Behavior—Helps the student become more effective in dealing with the human element in a business enterprise. Topics include individual factors such as personality, attitudes, perception and motivation; group factors such as communication, leadership, power and politics, group dynamics and conflict; and examples of organizational factors such as organizational structure and culture and managing change. Application to managing projects is used as much as possible.

Faculty and Staff

K. Takagaki, B.A., Ph.D.,C.M.A., C.D.P., Associate Dean
A. Abdulla, Dipl.T., B.Sc(EE), P.Eng., Program Head, Data Communications Systems
P. Abel, B.A. (Hons.), Program Head, Information Systems Option
B.R. Anderson, C.C.P., C.D.P., C.Tech., Program Head, Microcomputer Systems Option
R. Coolidge, Dipl.T.
K.D. Fraik, P.T.S. Administrative Assistant
D.L. Gervin, Dipl.T., B.Ed., B.A., M.A., C.D.P., Program Head (CST)
H. Holst, C.D.P., C.S.P. (on Leave of Absence)
M.W. Lo, B.Sc.(Hons.), M.Sc., Program Head, Advanced Diploma Program
R.B. Long, C.G.A., Manager, Information Technology Programs (P.T.S.)
F.J. Martin, B.A. (Hons.), M.Sc., F.L.M.I., C.D.P., Program Head, Expert Systems Option.
V.A. Nagel, Dipl.T., C.D.P.
J.L. Parry, B.Math.,
M. Ramkay, B.Sc.
M.E. Turner, M.B.A., Ph.D., P.Eng., Program Head, Decision Systems Option
A.Y.W. Wong, B.A.Sc., M.Eng., P.Eng.

(Part-Time and Sessional)

M. Ben Aissa
R. Chakravarti, B.Sc., M.B.A.
R. Day, BASc., M.A.
D. King, B.Math, M.A.
R. Mueller, Dipl.T., B.Sc.

Computer Systems Advisory Committee

N. Cercone, Professor and Director, Centre for Systems Science, Simon Fraser University
A. Elkington, President, Gateway Training and Consulting
G. Gisel, President, Sierra Systems Consultants Inc.
J. Grey, Branch Manager, B.C.Industry, IBM Canada Ltd.
J. Grushcow, President, Consumers Software Inc.
O. Hartviksen, Canadian Airlines International
G. Horner, Manager, Systems End User Services, Insurance Corp. B.C.
A. Jones, Sierra Systems Consultants, Inc.
W. Kurz
C. MacDonald, President, H.C.L. MacDonald & Assoc. Ltd.
B. Steele, President and Chief Operating Officer, Westech Information Systems Inc.
E. Will, Managing Director, LGS Group Inc.

FISH, WILDLIFE & RECREATION

Diploma Program

See Renewable Resources Technology, page 140.

FOOD TECHNOLOGY

Diploma Program

Graduates are employed by large companies such as Nabob Foods, Labatt's and Molson's, Sun-Rype and Lucerne Foods, Fraser Valley Foods, and Dairyland Foods. Beginning salaries vary according to the company. You can get a good idea of current salaries and job requirements from the classified sections of the major newspapers in your area. In B.C., employers often specify a BCIT Diploma or a science degree in their job requirements.

Program Length

Two years full-time beginning in September each year.

Total Fees (subject to change—does not include book or supply costs)

$3,965.30 for the two-year program (1993/94).

Degree Transfer/Completion

Simon Fraser University grants up to two years credit towards a B.Sc. in Biological Sciences to graduates of this program. BCIT graduates wanting a degree in Food Science from the University of British Columbia are assessed on an individual basis by UBC.

Prerequisites

High school graduation with English 12, Math 12 and Chemistry 11 are course requirements for the Food Technology program.

Program: FOOD TECHNOLOGY

Level 1			Clrm Hrs/wk
BIOT	1020	Introductory Microbiology	6.0
CHEM	1103	Chemistry 1 for Biological Sciences	6.0
FOOD	1030	Biology	5.0
FOOD	1090	Introduction to Food Technology	3.0
MATH	1441	Basic Technical Mathematics for Biological Sciences	6.0
PHYS	1144	Physics: Bio Sciences/ Biotechnology 1	5.0

Level 2		Clrm Hrs/wk
CHEM 2203	Chemistry 2 for Biological Sciences	6.0
COMM 1244	Communication for Biotech/Foodtech	4.0
FOOD 2010	Food Processing 1	6.0
FOOD 2020	Microbiology for Food Processing	5.0
MATH 2441	Statistics for Biological Sciences	5.0
PHYS 2144	Physics: Bio Sciences/ Biotechnology 2	5.0

Level 3		
BUSA 1100	Management	3.0
CHEM 3311	Instrumental Analytical Methods	5.0
FOOD 3010	Food Processing 2	5.0
FOOD 3030	Quality Control 1	4.0
FOOD 3040	Food Analysis 1	5.0
FOOD 3250	Sanitation for Food Processing	6.0
OPMT 1343	Operations Management for Food Technology	3.0

Level 4		
COMM 2454	Advanced Communication for Food Technology	3.0
ELEX 2825	Instrumentation for Biological Science	3.0
FOOD 4010	Food Processing 3	5.0
FOOD 4020	Process Systems for Food Technology	5.0
FOOD 4030	Quality Control 2	4.0
FOOD 4040	Food Analysis 2	5.0
FOOD 4390	Directed Studies for Food Technology	3.0
MATH 4441	Introduction to Computing for Biological Sciences	4.0

Course Descriptions

BIOT 1020 (BISC 102) Introductory Microbiology—The course is designed to train students in the basic microbiological procedures employed in a laboratory: the use and care of the microscope; staining methods, aseptic techniques; methods of identifying important micro-organisms.

BUSA 1100 (ADMN 102) Management—A study of the management functions of planning, organizing, staffing and controlling. Included are such topics as forms of business ownership, tactical and strategic planning, decision-making, structuring the organization, providing human resources and controlling operations. Students are given the opportunity to develop analytical and communication skills by analyzing and presenting solutions to typical business problems.

CHEM 1103 (CHEM 103) Chemistry 1 for Biological Sciences—An introductory course on 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 including WHMIS are emphasized.

CHEM 2203 (CHEM 203) Chemistry 2 for Biological Sciences—An introductory organic chemistry course with specific topics related to food technology. Topics include carbohydrates, lipids, proteins, solvents. Isomerism of selected compounds is discussed. Laboratory exercises consist of quantitative and qualitative analysis, and separation of organic compounds. Prerequisite: CHEM 1030.

CHEM 3311 (CHEM 311) Instrumental Analytical Methods—Instrumentation used for chemical analysis. The theory, construction, application and operation of instrumentation is discussed. Instruments include spectrophotometry (visible, UV, NIR and infra-red, emission, absorption), flame photometry, chromatography (gas, liquid, high pressure liquid). Laboratory exercises involve use of these instruments. Prerequisite: CHEM 2030.

COMM 1244 (TCOM 101) Communication for Biotech/Food Tech—This course teaches the skills necessary for success in the food industry. Students learn practical writing, speaking and presentation techniques, and the correct formats for short reports, instructions and lab reports. They also research and deliver an oral report on a new development their technology, write a skill-focused career package, take part in a meeting, and give a persuasive oral presentation.

COMM 2454 (TCOM 221) Advanced Communication for Food Technology—In this course, students update their career package, write and present a manual or feasibility study and a proposal, prepare a brochure, take part in meetings and give a persuasive presentation. Prerequisite: COMM 1244.

ELEX 2825 (ELEC 253) Instrumentation for Biological Science—An orientation course for the food processing option covering the principles and practices of automatic control systems. Operation and application of common measurement systems for pressure, temperature and flow are described. The principles of negative feedback and closed loop control are developed. Basic control strategies of on/off, proportional, integral and derivative are introduced. Principles of Programmable Logic Controllers are presented so that food technologists can communicate their needs to PLC programmers.

FOOD 1030 (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.

FOOD 1090 Introduction to Food Technology—An introduction to the field of food science and technology. The sciences used to provide knowledge for food technology, the importance of food in providing proper nutrition, and the opportunities for employment in the food industry will be discussed.

FOOD 2010 (BISC 201) Food Processing 1—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 food packaging. Experimental portions of food will be preserved by various methods during lab periods. Prerequisite: BIOT 1020, CHEM 1030. Corequisite: CHEM 2030.

FOOD 2020 (BISC 202) Microbiology for Food Processing—The application of microbiology to food manufacturing. The isolation of micro-organisms significant to food processing. Maintaining high bacteriological standards in processed foods. Shelf-life studies, spoilage control, food fermentation. Assessing microbiological test results and report writing to management. Prerequisite: BIOT 1020. Corequisite: FOOD 2010.

FOOD 3010/4010 (BISC 301/401) Food Processing 2—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: FOOD 2010. Corequisite: FOOD 3030.

FOOD 3030 (BISC 303) Quality Control 1—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 tri-stimulus colorimetry and measurement of color in foods. Prerequisite: FOOD 2010, MATH 2441.

FOOD 3040 (BISC 304) Food Analysis 1—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 1030, 2030. Corequisite: CHEM 3110.

FOOD 3250 (BISC 406) Sanitation for Food Processing—Good manufacturing practices, personal hygiene, HACCP systems relating to the sanitation of food plants are stressed. Properties of appropriate cleaners and sanitizers are studied together with the proper use of equipment for cleaning. Sanitary and safety design of food processing plants and equipment as well as appropriate waste management are discussed.

FOOD 4010 (BISC 401) Food Processing 3—See FOOD 3010. Prerequisite: FOOD 3010. Corequisite: FOOD 4020.

FOOD 4020 (BISC 402) Process Systems for Food Technology—The acquisition and handling of materials for food processing are presented. Operations used in food processing systems such as heat transfer and product separation are studied. Dehydration, packaging, fluid and solids handling systems used in food processing plants are discussed. Prerequisite: PHYS 1144, 2144.

FOOD 4030 (BISC 403) Quality Control 2—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: FOOD 3030.

FOOD 4040 (BISC 404) Food Analysis 2—An introduction to the chemistry and practical laboratory analysis of lipids, vitamins and minerals. Methods for the determination of food additives, detection of food contaminants (e.g. aflatoxin), and the characterization of food processing waste water will also be addressed. Prerequisite: FOOD 3040, CHEM 3110.

MATH 1441 (MATH 144) Basic Technical Mathematics for Biological Sciences—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 and other applications of the derivative, the differential, derivative, anti-derivatives, indefinite integral, definite integral with area under a curve. Introduction to MS-DOS computing using spreadsheet software.

MATH 2441 (MATH 244) Statistics for Biological Sciences—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 4441 (MATH 444) Introduction to Computing for Biological Sciences—Database applications using Lotus 1-2-3 with an introduction to macros. Topics include design of the database, queries, tables, regression, data distributions and associated graphics. This course is intended to provide data handling support for directed studies projects the students do in the last term of their program. Prerequisite: MATH 1441.

OPMT 1353 (OPMT 353) Operations Management for Food Technology—This course covers the principles of Total Quality Management (TQM) and how they relate to business requirements for modern quality management systems in the food processing industry. In addition to regulations for the industry, global trading customers are demanding the implementation of quality management systems equivalent to ISO 9000 or CAN3-Z299 series. These create a foundation for company practice which is enhanced by continuous improvement in all operations generated by TQM. Topics include maximizing employee potential, employee empowerment, systematic problem-solving and measurement for total quality.

PHYS 1144 (PHYS 102) Physics: Biosciences/Biotechnology 1—An introductory course which covers a wide range of physical principles, with special relevance to biological sciences technology. First term topics include kinematics, dynamics, friction, statics, energy, power, circular motion, momentum, properties of solids, fluids and fluid mechanics.

PHYS 2144 (PHYS 202) Physics: Biosciences/Biotechnology 2—Second term topics include temperature, heat, calorimetry, kinetic theory, heat transfer, basic electricity and magnetism, colorimetry, optics and radiation. Measurement, data analysis, experimental techniques and report writing are emphasized. Prerequisite: PHYS 1144.

Faculty and Staff

K.G. Cummings, Dipl.T.
W. Hooge, B.S.A., P.Ag.
A. McCannel, B.Sc., M.Sc.
V.J. Martens, B.S.A., M.Sc., P.Ag., Program Head, Food Technology
J. L. Nichols, B.Sc., M.Sc., Ph.D.
A.C. Rodriguez, B.S., M.S., Ph.D. (on leave)
J.K. Soutter, H.D.F.T., A.Sc.T.
K. Turner, B.Sc., M.Sc., P.Ag.

Advisory Committee Members: Food Technology

A. Gelder, Lucerne Foods Ltd. (Chairperson)
G. Christie, Dairyland Foods
I. Devlin, Fisheries & Oceans Canada
L. Sullivan, Nabob Foods Ltd.
B. F. McCrum, Agriculture Canada
R. Clark, Flavour House Ltd.
R. Minchin, Thos. J. Lipton Ltd.
R. Patterson, Lilydale Poultry Coop
I. Woodrow, B.C. Food Technology Centre

FORESTRY

Diploma Program

See Renewable Resources Technology, page 140.

GEOGRAPHIC INFORMATION SYSTEMS

Advanced Diploma Program

Geographic Information Systems (GIS) technology is rapidly transforming the way in which we manage and use geographic data, and is increasingly being recognized as an essential tool in such diverse fields as forest management, urban planning, engineering, municipal management, and environmental studies.

The Advanced Diploma Program in Geographic Information Systems is designed for students with a background in a relevant discipline or technology. The Program is available in a full-time 9-month program format, through part-time studies, or a combination of these.

The curriculum balances theory and practice and covers GIS principles, training in GIS software, technical issues in GIS, remote sensing, digital mapping, computer programming and management issues in GIS. Each student also undertakes the design and implementation of a major independent GIS project.

Entrance Requirements

Diploma of Technology or University/College Degree in a related field. Students should possess good communication skills, ability to reason in a logical manner, a good disposition towards team work, fundamental computer literacy and computer programming skills.

Applicants should submit a resume and a letter of intent explaining their reasons for taking the program. Applications should indicate clearly whether the program is to be taken on a full-time or part-time basis.

Program of Studies

The general course requirement for graduation from the program is a minimum of 50 credits, but may be greater, depending on academic background. ADP courses are selected from the following categories:

Credits	
ADP Technology Courses	27
Management	8
Projects	15

Courses in these categories require a suitable background in the following areas: Computer programming (C programming, file and data handling); Mathematics (numerical methods,

linear algebra, statistics); Fundamentals of Computer Systems (mathematics for computing, operating systems, hardware and software technology, applications), fundamentals of GIS, fundamentals of mapping for GIS, communications.

Students lacking formal education or proven ability in these areas will be required to complete the following foundation technology courses or their equivalent:

Foundation Technology			Credits
MECH	7070	Introductory C Programming	3.0
(AICO	823)	Data Structures in C	3.0
(AICO	750)	Database Systems	3.0
GIST	5121	Applied Mathematics 1	3.0
GIST	5130	Technical Topics in Computer Systems	3.0
GIST	6121	Applied Mathematics 2	3.0
GIST	5108	Fundamentals of Mapping	3.0

Some of these courses may be taken concurrently with ADP Core and Advanced Technology Courses. All students entering the program will initially be registered in the fundamental courses and may apply for credit or exemption after program commencement.

ADP Technology (27 credits required)

Core (15 credits)

GIST	5100	Fundamentals of GIS	3.0
GIST	6100	Technical Issues in GIS	3.0
GIST	5133	GIS Database Systems	3.0

One of:

GIST	5125	PAMAP GIS Level 1	3.0
GIST	5126	Terrasoft GIS Level 1	3.0
GIST	5128	ARC/INFO GIS Level 1	3.0

One of:

GIST	6125	PAMAP GIS Level 2	3.0
GIST	6126	Terrasoft GIS Level 2	3.0
GIST	6128	ARC/INFO GIS Level 2	3.0

Advanced Technology (12 credits)

GIST	6102	Applications Modelling and Customization	3.0
GIST	6101	Selected Topics in GIS	3.0
GIST	6118	Remote Sensing	3.0
GIST	6108	Digital Mapping	3.0
GIST	6133	Object Oriented Programming with C++	3.0
GIST	6134	Data Communications and Networking	3.0

Management (8 credits minimum)

Required:

GIST	6110	Management Issues in GIS	3.0

Electives: (Suggested)

GIST	6135	GIS System Management	3.0
MECH	7060	Graphic System Management	2.0

Students may also select Management course electives from other advanced diploma or degree programs, subject to program approval.

Project (15 credits)

GIST	5119	Technology Assessment	3.0
GIST	5120	Project Planning	3.0
GIST	6120	Project	9.0

Course Descriptions

GIST 5100 (GIST 700) Fundamentals of Geographic Information Systems—An overview of GIS covering fundamental concepts and terminology, the role of GIS in spatial data management and digital mapping, the multipurpose cadastre and resource GIS, methods of data collection and input, data modelling and representation, storage and retrieval of spatial data, concepts of database systems, manipulation and analysis features of GIS.

GIST 5108 (GIST 708) Fundamentals of Mapping—Examines the technologies associated with the acquisition and modelling of primary coordinate data for GIS base maps. Topics covered include coordinate systems and map projections, mapping systems, photogrammetric mapping, global positioning systems, accuracy of spatial data.

GIST 5119 (GIST 719) Technology Assessment—Hardware and software for GIS and related technologies. System comparison and evaluation for project implementation.

GIST 5120 (GIST 720) Project planning—Students will research project topics, present a project proposal, establish supervisors, identify sources of data and begin data acquisition.

GIST 5121 (GIST 721) Applied Mathematics 1—Numerical methods. Floating point computations, matrices, and simultaneous linear equations, interpolation methods, approximation methods, linear algebra, solutions to non-linear equations.

GIST 5125 (GIST 725) PAMAP GIS Level 1—Introduction to operational aspects of PAMAP GIS software in a microcomputer environment. Topics include data entry, editing and map design GIS operations using MAPPER, and fundamental GIS operations using ANALYZER. Working problems drawn from resource management.

GIST 5126 (GIST 726) Terrasoft GIS Level 1—Introduction to operational aspects of TERRASOFT GIS software in a microcomputer environment. Topics include data entry, editing and map design in TERRASOFT CAD environment, and fundamental GIS operations. Working problems drawn from resource management and urban applications.

GIST 5128 (GIST 728) ARC/INFO GIS Level 1—Introduction to operational aspects of GIS software using ARC/INFO GIS in a workstation environment. Topics include data entry and editing in ARCEDIT, map design in ARCPLOT, and fundamental GIS operations. Working problems drawn from resource management and urban applications.

GIST 5130 (GIST 730) Technical Topics in Computer Systems—Reviews trends in computer system architecture, hardware and software, operating systems, programming languages, and application programs. Concepts of data communications and networking, and introductory mathematics for computing.

GIST 5133 (GIST 733) GIS Database Systems—Introduces students to relational database systems in a networked GIS software environment. Topics include the relational database model, relational algebra, query languages, data definition language, data dictionaries, normal forms, distributed systems. Linking databases and GIS. Prerequisite: (AICO 750).

GIST 6100 (GIST 800) Technical Issues in GIS—Examines a variety of data structures and algorithms used in GIS. Covers such topics as digital elevation modelling, spatial interpolation, generalization, data standards, digital data exchange, and data integration. Prerequisite: GIST 5100.

GIST 6101 (GIST 801) Selected Topics in Geographic Information Systems—Examines current topics in GIS such as rule- and knowledge-based systems, error in GIS, visualization, three and four dimensional GIS, object oriented databases and programming, multi-media. Prerequisite: GIST 6100.

GIST 6102 (GIST 802) Applications Modelling and Customization—Raster and vector methods of modelling with GIS software. Customization of GIS software: macro programming, menu development, applications programming interfaces. Prerequisites: GIST 5100; GIST 5125/6125 OR GIST 5126/6126 OR GIST 5128/6128.

GIST 6108 (GIST 808) Digital Mapping—Standard practices for compilation, transformation, editing and storage of digital spatial data. Prerequisite: GIST 5108.

GIST 6110 (GIST 810) Management Issues in GIS—GIS project management, GIS integration with external systems, data acquisition and conversion issues, training issues, spatial data management. Prerequisite: GIST 5100; GIST 6100.

GIST 6118 (GIST 718) Remote Sensing—Describes the concepts and foundations of remote sensing; the features of the instrumentation used in remote sensing; defines pattern recognition and examines the key steps in applying remote sensing to earth resources management problems. Prerequisite: GIST 6121 (may be taken concurrently).

GIST 6120 (GIST 820) Project—Continuation of GIST 720. Students will implement and manage a major independent project. Prerequisite: GIST 5120.

GIST 6121 (GIST 821) Applied Mathematics 2—Spatial Statistics. Prerequisite: GIST 5121.

GIST 6125 (GIST 825) PAMAP GIS Level 2—A continuation of GIST 725 covering the interpreter, topographer and file translator utilities and user commands. Prerequisite: GIST 5125.

GIST 6126 (GIST 826) Terrasoft GIS Level 2—A continuation of GIST 726 covering use of database software, coordinate geometry, digital terrain modelling, analytical GIS functions, and data import/export. Prerequisite: GIST 5126.

GIST 6128 (GIST 828) ARC/INFO GIS Level 2—A continuation of GIST 728 covering use of ARC macro language programming, coordinate geometry, digital terrain modelling, analytical GIS functions, data import/export, cartographic production. Prerequisite: GIST 5128.

GIST 6133 (GIST 833) Object Oriented Programming With C++—Introduces concepts of object oriented programming (encapsulation, inheritance, polymorphism) using C++ in a microcomputer environment. Problems drawn from computer graphics and geographic information systems. Prerequisite: MECH 7070;(AICO 823).

GIST 6134 (GIST 834) Data Communications and Networking—Communication between computers. Networking theory and practice. Distributed processing with special emphasis on microcomputers. Software management of LAN systems. Theory of ETHERNET and ISO standard. Prerequisite: GIST 5130.

GIST 6135 (GIST 735) GIS System Management—Account management, system backup, startup and shutdown procedures, system accounting, system security. Introduction to networking, distributed GIS databases in a heterogenous computing environment. Prerequisite: GIST 5130 or equivalent industry experience.

MECH 7060 (AICO 707) Graphic System Management—Issues related to the acquisition, implementation and management of computer systems for CAD/CAM applications. Drawing files management, hardware and software selection, networking, security and maintenance.

MECH 7070 (AICO 722) Introductory C Programming—Provides an introduction to programming in the C language on microcomputers. Topics include looping, decision-making, functions, arithmetic and string manipulation, pointers.

(AICO 750) Database Systems—An introduction to database systems: hierarchical, network and relational models. Students will receive hands-on experience with cmmercial database software. Emphasis in engineering and geographic applications.

(AICO 823) File and Data Structures—Sequential, direct and keyed indexed file handling. Queues, linked lists, trees. Prerequisite: MECH 7070 (AICO 722). Recommended: GIST 5130 or equivalent.

Faculty and Staff

D. Deans, B.A., Associate Dean
J. Candy, H.N.C., Dipl.Tech., B.Sc., Coordinator
R. Miller, Dipl.Tech., B.A., M.Sc., Program Head
S. Churchill, B.Sc.

Geographic Information Systems Advisory Committee

C. Hermansen, Timberline
R. Balser, Ministry of Crown Lands
M. Feuchtwanger, Simon Fraser University
K. Fila, Shortreid Terrain Data Ltd.
C. Goodbrand, Reid, Collins and Associates
W. Herdin, District of Coquitlam
M. Kramer, H.A. Simons Ltd.
R. Lake, MacDonald Dettwiler and Associates
D. Lemkow, Digital Resource Systems
T. Naylor, District of Surrey
F. Peet, Eidetic Digital Imaging Ltd.
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D. Reiner, Digital Mapping Group Ltd.
P. Sallaway, PAMAP Technologies
D. Wills, Smith, Sierra Systems Consultants, Inc.
D. Stewart, ESRI Canada Ltd.
G. Tomlins, B.C. Research Council
B. Whitehead, MacMillan Bloedel

MECHANICAL DESIGN AND MANUFACTURING TECHNOLOGIES

CAD/CAM
Mechanical Design
Mechanical Manufacturing
Mechanical Systems
Plastics
Robotics and Automation
Industrial Education (Technology Education)
Teacher Education

Common First Year

The CAD/CAM, Mechanical Design, Mechanical Manufacturing and Mechanical Systems programs share a common first year of a two-year program. On successful completion of the first year, students select their appropriate option to complete the diploma requirements.

***Note:** Mechanical Technologies are currently under curriculum review.

Program Length

Two years full-time beginning in September each year.

Total Fees (subject to change—does not include book or supply costs)

$3,965.30 for the two-year program (1993/94).

Prerequisites

For first year applicants: High School graduation with English 12, Math 12 and Physics 11.

Direct entry applicants into second year are assessed individually on their post-secondary academic achievement, experience and computer skill (MECH 2205 or equivalent). Applicants should have a solid academic background and good communication skills, be able to apply ideas in practical situations and be able to work effectively with people in a team situation.

Degree Transfer/Completion

Graduates from the program have the option of obtaining their engineering degrees by applying to the University of Victoria or Lakehead University, which have bridging agreements with BCIT.

Graduate Programs

Graduate engineering technologists and engineers are offered the opportunity of upgrading their skills through the Mechanical Advanced Diploma programs.

Common First Year Courses

Level 1		Clrm Hrs/wk
CHSC 1105	Engineering Materials 1	4.0
COMM 1149	Technical Communication	4.0
MATH 1491	Technical Mathematics for Mechanical	5.0
MECH 1100	Engineering Graphics 1	3.0
MECH 1105	CAD Graphics 1	4.0
MECH 1120	Introduction to Thermal Processes	3.0
MECH 1140	Statics	74.0
MECH 1170	Computer Applications	3.0

Level 2		
CHSC 2205	Engineering Materials 2	4.0
MATH 2491	Calculus for Mechanical	4.0
MECH 1210	Manufacturing Processes	4.0
MECH 2200	Engineering Graphics 2	3.0
MECH 2205	CAD Graphics 2	4.0
MECH 2240	Strength of Materials	4.0
MECH 2245	Dynamics	4.0
PHYS 2149	Physics for Mechanical	4.0

CAD/CAM TECHNOLOGY

Diploma Program

Engineering and industrial practices have been and will continue to be transformed by the introduction of computers into the workplace. Engineers and technologists routinely use CAD (Computer Aided Design), CAM (Computer Aided Manufacturing) and CAE (Computer Aided Engineering). A graduate of the CAD/CAM program will be capable of applying engineering principles to the solution of engineering and industrial problems as well as managing computers in an engineering environment.

CAD/CAM technology has important applications in the production, supervision, distribution and storage of the computerized design database. The design database not only conveys the graphical information needed for the design and development of machines, tools, buildings and structures, but also the associated non-graphical information. The exchange of both graphical and non-graphical information between databases allows engineers and technologists to use computers more efficiently for both design and manufacturing.

Job Opportunities

While the primary area of employment for the CAD/CAM technologist is the mechanical design and manufacturing industry, graduates have found work in the many disciplines that use CAD/CAM. Some graduates have worked for software developers, consulting and service companies. Other graduates have successfully started their own companies to supply CAD/CAM services.

The Program

The common first-year provides training in the traditional engineering disciplines and the operation of CAD systems. The second year develops the student's skills in computer applications and processes as well as mechanical design.

Accreditation

It is anticipated that this option will be accredited by the Applied Science Technologists and Technicians of British Columbia.

***Note:** CAD/CAM is currently under curriculum review. There may be adjustments to the courses described below.

Specialty: CAD/CAM

Second Year Courses

Level 3		Clrm Hrs/wk
CDCM 2370	Data Structures in "C"	6.0
CDCM 3305	CAD Graphics 3	3.0
CDCM 3375	CAD Customization	4.0
MATH 3491	Numerical Methods for Mechanical	4.0
MECH 2350	Fluid Power 1	3.0
MECH 3340	Machine Design 1	4.0
MANU 3318	CNC Programming	5.0

Level 4		
CDCM 3460	CAD/CAM System Management	3.0
CDCM 3470	File Handling and Database	6.0
CDCM 4405	CAD Graphics 4	4.0
CDCM 4490	CAD/CAM Projects	5.0
COMM 2460	Advanced Technical Communication for CAD/CAM	4.0
MATH 4602	Mathematics for CAD/CAM	4.0
MECH 4440	Machine Design 2	5.0

MECHANICAL TECHNOLOGY (Design or Manufacturing Specialties)

Diploma Program

The mechanical technologist may be employed in the design, selection, fabrication and installation of machines and mechanical devices, and in the production side of manufacturing. It is a field of tremendous scope where technologists 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 other installations. 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.

Accreditation

This option is accredited by the Applied Science Technologists and Technicians of B.C.

*Note: The Design Specialty is currently under curriculum review. There may be adjustments to the courses described below.

Specialty: DESIGN

Second Year Courses

Level 3		Clrm Hrs/wk
ELEX 2845	Electrical Equipment	4.0
MATH 3491	Numerical Methods	4.0
MECH 2310	Manufacturing Processes 2	4.0
MECH 2350	Fluid Power 1	3.0
MECH 3315	Manufacturing Processes 3	4.0
MECH 3320	Thermal Engineering 1	4.0
MECH 3325	Fluid Mechanics	4.0
MECH 3340	Machine Design 1	4.0
MECH 3345	Computer Aided Engineering	4.0

Level 4		
COMM 2449	Technical Communication	4.0
ELEX 2835	Instrumentation for Mechanical	4.0
MECH 3450	Fluid Power 2	3.0
MECH 3460	Engineering Economics (Term 4A)	3.0
MECH 4420	Thermal Engineering 2	4.0
MECH 4425	Fluid Systems (Term 4B)	4.0
MECH 4440	Machine Design 2	5.0
MECH 4490	Design Projects	5.0

*Note: The Manufacturing specialty is currently under curriculum review. There may be adjustments to the courses listed below.

Specialty: MANUFACTURING

Second Year Courses

Level 3		Clrm Hrs/wk
ELEX 2845	Electrical Equipment	4.0
MANU 3310	Material Removal Processes	5.0
MANU 3312	Computer Aided Manufacturing	4.0
MANU 3316	Advanced Materials	4.0
MECH 2350	Fluid Power 1	3.0
MANU 3314	Tool Design	5.0
OPMT 1182	Total Quality Mgt.	5.0

Level 4		
COMM 2449	Technical Communication	4.0
MANU 4410	Material Joining Processes (Term 4A)	4.0
MANU 4412	Production Planning (Term 4B)	4.0
MANU 4450	Automated Manufacturing	4.0
MANU 4490	Manufacturing Projects (Term 4B)	3.0
MATH 4491	Statistics/Quality Control	4.0
MECH 3440	Mechanical Equipment (Term 4A)	4.0
MECH 3450	Fluid Power 2	3.0
MANU 3410	Metrology	4.0
OPMT 1411	Production Management	4.0

MECHANICAL SYSTEMS

Diploma Program

Mechanical systems for buildings must provide comfortable, healthy and safe environments for occupants and, as well, optimize energy use. Advancing technology provides a wide range of challenging careers in a dynamic industry where Mechanical Systems graduates perform many technical tasks as a part of a multidisciplinary team of professionals, sales and tradespersons. In recent years, the pursuit of higher building standards has placed greater demands on mechanical systems providing expanding opportunities for the graduate.

Job Opportunities

Graduates of the Mechanical Systems Option may assume the role of mechanical estimator, mechanical systems designer, specification writer, field inspector or may be employed in sales, systems balancing companies in areas of heating-ventilating and air conditioning, fire protection, plumbing systems and mechanical equipment operation and maintenance. Supervisory posts may be assumed after appropriate job experience.

The Program

Course material examines water distribution, drainage, fire protection, refrigeration, heating, ventilating and air conditioning, mechanical equipment and maintenance for buildings, backed by support courses which include fluid engineering, thermodynamics, and computer applications.

Accreditation

This option is accredited by the Applied Science Technologists and Technicians of British Columbia.

*Note: Mechanical Systems is currently under curriculum review. There may be adjustments to courses listed below.

Specialty: MECHANICAL SYSTEMS

Second Year Courses

Level 3		Clrm Hrs/wk
ELEX 2840	Instrumentation for Mechanical Systems/ Plastics	5.0
MATH 3491	Numerical Methods	4.0
MECH 3320	Thermal Engineering 1	4.0
MECH 3325	Fluid Mechanics	4.0
MSYS 2380	Interpretation of Building Construction	4.0
MSYS 3380	Air Conditioning 1	3.0
MSYS 3384	Heating and Ventilating 1	4.0
MSYS 3388	Plumbing	3.0

Level 4		Clrm Hrs/wk
COMM 2449	Technical Communication	4.0
MECH 3440	Mechanical Equipment (Term 4A)	4.0
MECH 3460	Engineering Economics (Term 4A)	3.0
MSYS 4440	Mechanical Systems (Term 4B)	4.0
MSYS 4460	Mechanical Estimating (Term 4B)	4.0
MSYS 4465	Maintenance Management (Term 4B)	4.0
MSYS 4480	Air Conditioning 2	6.0
MSYS 4484	Heating and Ventilating 2	4.0
MSYS 4488	Fire Protection (Term 4A)	4.0
OPMT 1460	Industrial Engineering	4.0

PLASTICS

Diploma Program

The program is designed to provide practical and theoretical training in plastic product/mold engineering with emphasis on a thorough understanding of the processes used to produce quality plastic products for a variety of applications: packaging, coatings and adhesives, construction, electronics, electrical, consumer, automotive, etc.

Job Opportunities

The plastics industry is the fastest growing secondary manufacturing industry in Canada, particularly in B.C. This tremendous growth is expected to continue on a broad scale. Graduates of the Plastics Technology program will find opportunities for satisfying and rewarding careers in manufacturing, product and process research and development, technical sales and marketing, product and mold 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 thermoforming, rotational molding, injection molding, blow molding, extrusion, film 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 science, polymer chemistry, mathematics, technical communication, mechanical design and computer-aided drafting.

Prerequisites

High school graduation with English 12, Math 12 and either 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.

Accreditation

It is anticipated that this program will be accredited by the Applied Science Technologists and Technicians of British Columbia.

Program: PLASTICS

		Clrm Hrs/wk
Level 1		
CHEM 1120	General Chemistry for Plastics	4.0
COMM 1149	Technical Communication	4.0
MATH 1491	Technical Mathematics for Mechanical	5.0
MECH 1100	Engineering Graphics 1	3.0
MECH 1105	CAD Graphics 1	4.0
MECH 1140	Statics	4.0
MECH 1170	Computer Applications	3.0
PLAS 1110	Plastics Technology 1	4.0
Level 2		
CHEM 2220	Organic Chemistry for Plastics	4.0
CHSC 1262	Engineering Materials for Plastics Technology	3.0
MATH 2491	Calculus for Mechanical	4.0
MECH 1210	Manufacturing Processes	4.0
MECH 2200	Engineering Graphics 2	3.0
MECH 2240	Strength of Materials	4.0
PHYS 1162	Physics for Plastics Technology	4.0
PLAS 2210	Plastics Technology 2	4.0
Level 3		
CHEM 3320	Polymer Chemistry and Technology	4.0
ELEX 2840	Instrumentation for Mechanical Systems/Plastics	5.0
MATH 3491	Numerical Methods	4.0
MECH 2350	Fluid Power 1	3.0
MECH 3340	Machine Design 1	4.0
PLAS 3310	Plastics Technology 3	7.0
PLAS 3340	Plastics Design	2.0
PLAS 3345	Injection Molding Analysis	2.0
Level 4		
COMM 2462	Technical Communication for Plastics	4.0
MATH 4491	Statistics/Quality Control	4.0
MECH 3450	Fluid Power 2	3.0
MECH 3460	Engineering Economics (Term 4A)	3.0
OPMT 1411	Production Management	4.0
PLAS 3440	Fiber Reinforced Plastics	4.0
PLAS 4410	Plastics Technology 4	6.0
PLAS 4490	Plastics Project	4.0

ROBOTICS AND AUTOMATION

Cooperative Diploma Program

The Robotics and Automation 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 automated machinery in a modern, well-equipped lab will be emphasized. Particular attention will be given to applying automation techniques to industries in British Columbia.

Job Opportunities

Graduates of the Robotics and Automation Technology find employment in industries utilizing computers and electronics to control mechanical systems. Technologists write specifications and plan for purchasing new equipment, design, construct and implement control systems and troubleshoot and maintain automation systems. Some graduates are currently working as Research and Development technologists while others have successfully started their own automation consulting businesses.

The Program

The Robotics and Automation program consists of four terms. Students are admitted into the first level in September only. This is a cooperative education program which combines academic terms with salaried cooperative work terms. Students wanting to participate in the coop program must meet separate requirements in addition to the technology entrance requirements. These requirements are available from the Coop Office. The complete Cooperative Education Policy including student, Institute and employer responsibilities is available through the Cooperative Education Office and the Registrar's Office.

Degree Transfer/Completion

Transfer credit from the Robotics and Automation Technology to University degree programs is possible, on an individual basis.

Accreditation

It is anticipated that this program will be accredited by the Applied Science Technologists and Technicians of British Columbia.

Prerequisites

High school graduation with Math 12 and Physics 11, both with C+ or better, and English 12 are required for this program. Preference will be given to those candidates who have completed the prerequisites, and an Industrial Education course, within the last three years.

Program: ROBOTICS & AUTOMATION

Level 1 (September—January)			Clrm Hrs/wk
COMM	1163	Technical Writing for Robotics	3.0
ELEX	1105	Circuit Analysis 1	6.0
ELEX	1115	Digital Techniques 1	5.0
ELEX	2125	"C" Programming	4.0
MATH	1341	Basic Technical Math for Robotics	6.0
MECH	1110	Production Processes 1	4.0
PHYS	1163	Physics for Robotics Technology	5.0

Level 2 (February—May)			
ELEX	2105	Circuit Analysis 2	5.0
ELEX	2115	Digital Techniques 2	6.0
ELEX	2120	Electronic Circuits 1	7.0
MATH	2341	Calculus for Robotics	6.0
MECH	2210	Production Processes 2	4.0
PHYS	2163	Applied Physics for Robotics Technology	5.0

Level 3 (September—January)			
ELEX	3205	Data Acquisition and Signal Conditioning	6.0
MATH	3341	Transform Calculus for Robotics	4.0
MECH	2355	Fluid Power 1 (Robotics)	3.0
ROBT	3340	Robot Applications	7.0
ROBT	3350	Automation Equipment	5.0
ROBT	3355	Microprocessors /Interfacing	6.0

Level 4 (February—May)			
COMM	2463	Advanced Technical Writing/Robotics	3.0
ELEX	4335	Feedback Systems	7.0
MECH	3455	Fluid Power 2 (Robotics)	3.0
OPMT	1183	Industrial Engineering for Robotics	4.0
ROBT	3415	Computer Integrated Manufacturing	5.0
ROBT	4450	Robot Sensors	5.0
ROBT	4490	Robotics Project	4.0

INDUSTRIAL EDUCATION (TECHNOLOGY EDUCATION) TEACHER EDUCATION

Certificate Program

The Teacher Education program for (Industrial) Technology Education teachers is a cooperative program between BCIT and UBC which consists of 3 components:

- 30 credits of university transfer arts and science courses completed at a university or college;
- completion of a Certificate or Diploma of Industrial Education program at BCIT;
- completion of the pedagogical program at UBC culminating in a Bachelor of Education Degree.

After completing some or all of the 30 credits of university transfer courses, all applicants apply to BCIT to enter this cooperative program. Applicants may contact the Faculty of Education at UBC for specific information about the UBC portion of the program or suitability of transfer courses.

The BCIT portion of the program provides students with the technical skills and knowledge and some basic career experience required for teaching industrial and technology education in B.C. schools. This program may also lead to careers in post-secondary, industrial training or other occupations that require technical generalists. There are 2 program options: Regular and Accelerated.

Regular Program Option

The BCIT Regular program is open to graduates of secondary schools who do not have formal trade or technological training and work experience. In this program, the student will take one year of university transfer courses at any college or university, two years of technical training at BCIT and finally attend UBC for a 12-month program that culminates in the B.Ed. degree and B.C. Professional Teaching Certificate. Potential applicants to the program are advised to complete courses in Math and Sciences (Chemistry, Physics) as a part of the university transfer component.

Applicants must have good English oral and writing skills and should complete one or more courses in mathematics and science at the graduation level. Preference will be given to applicants who have completed one or more TTED courses or to applicants with some identifiable technical experience.

***Note:** IETE is currently under curriculum review. There may be adjustments to the courses listed below.

Program: IETE REGULAR

Level 1 Term 1 (Sept—Dec)			Clrm Hrs/wk
TTED	3100	Teaching Design Drawing and CAD 1	6.0
TTED	3110	Teaching Precision Measurement	1.0
TTED	3120	Teaching Product Manufacturing	16.0
TTED	3140	Materials in Technology Ed 1	4.0
TTED	3170	Using Computers in Teaching	3.0

Level 2 Term 2 (Jan—May)			
TTED	4200	Teaching Design Drawing and CAD 2	6.0
TTED	4240	Materials in Technology Ed 2	4.0
TTED	4250	Power and Energy for Tech Ed	8.0
TTED	4260	Teaching Electronics 1	8.0
TTED	4270	Using Computers in Teaching	2.0

Level 3 Term 3 (Sept—Dec)			
MATH	5941	Basic Mathematics IETE	4.0
TTED	5350	Teaching Automotive Systems 1	10.0
TTED	5360	Teaching Electronics 2	10.0
TTED	5370	Managing Computer Labs 1	2.0
TTED	5390	Introduction to Tech Ed	4.0

Level 4 Term 4 (Jan—May)			
COMM	1594	Communication for IETE	4.0
TTED	6400	Teaching Design and CAD 3	3.0
TTED	6420	Teaching Metal Product Manufacturing	8.0
TTED	6430	Teaching Wood/Composites Manufacturing	8.0
TTED	6470	Managing Computer Labs 2	2.0
TTED	6480	Technical Projects for Tech Ed	4.0
TTED	6490	Tech Ed Applications	4.0

Accelerated Program Option

To qualify for entrance to the Accelerated Program, an applicant must have journeyed or technology certification, or equivalent, in an area related to the B.C. school technical curriculum. This program allows successful students to earn a B.C. Standard Teaching Certificate after two years training, one at BCIT and one at UBC. The requirements for the B.Ed. degree and the Professional Certificate may be completed later through part-time evening and summer courses.

Although admission is possible without completion of all university transfer courses, only applicants with 12 credits of university transfer courses including 6 credits of English will be admitted. Potential applicants to the program are advised to complete courses in Math and Sciences (Chemistry, Physics) as a part of the university transfer component.

Program: IETE ACCELERATED

Level 1 Term 1 (Sept—Dec)			Clrm Hrs/wk
MATH	5941	Basic Math for IETE	4.0
TTED	3100	Teaching Design Drawing and CAD 1	6.0
TTED	3110	Teaching Precision Measurement	1.0
TTED	3120	Teaching Product Manufacturing 1	16.0
TTED	3140	Materials in Technology Ed 1	4.0
TTED	3170	Using Computers in Teaching 1	3.0
TTED	5390	Introduction to Tech Ed	4.0

Level 2 Term 2 (Jan—May)			
COMM	1594	Communication IETE	4.0
TTED	4200	Teaching Design Drawing and CAD 2	6.0
TTED	4240	Materials in Technology Ed 2	4.0
TTED	4250	Power and Energy for Tech Ed	8.0
TTED	4260	Teaching Electronics 1	8.0
TTED	4270	Using Computers in Teaching 2	2.0
TTED	6490	Tech Ed Applications	4.0

Course Descriptions

CDCM 2370 (AIC0 504) Data Structures in "C"—Introduction to "C". Emphasis will be on the solution of problems solvable in a microcomputer environment, software package design and implementation, and programming techniques. Problems will be selected from polygon processing algorithms. Prerequisite: MECH 1170 or equivalent.

CDCM 3305 (CDCM 311) CAD Graphics 3—2D and 3D graphics using Microstation software.

CDCM 3375 (CDCM 305) CAD Customization—The productivity and utility of commercially available CAD software is increased by enhancing and tailoring the software for specific disciplines. The use of AutoLISP for applications with AutoCAD. Accessing the CAD database. Prerequisite: MECH 2205.

CDCM 3460 (CDCM 407) CAD/CAM System Management—Issues related to the acquisition, implementation and management of computer systems for CAD/CAM applications. Drawing files management, hardware and software selection, networking, security and maintenance.

CDCM 3470 (AICO 601) File Handling and Database—Sequential, direct and keyed indexed file handling. Introduction to database systems; hierarchical, network and relational. Emphasis on micro-based systems and engineering applications. Inventory control, bill of materials (BOM), discussion of databases and their impact in an integrated data processing environment. Prerequisite: CDCM 2370.

CDCM 4405 (CDCM 408) CAD Graphics 4—Computer generation of 3D models using wireframe, surface and solids modelling software. The creation and generation of shaded models and animation for engineering applications. Prerequisite: MECH 2205.

CDCM 4490 (CDCM 409) CAD/CAM Projects—Students integrate skills in graphics, programming, databases and engineering technology and apply them to industrial purposes.

CHEM 1120 (CHEM 120) General Chemistry for Plastics—Review of general principles of chemistry leading to an understanding of matter, plastic or otherwise. Includes physical and chemical change, atomic structure and bonding. Equations, molar weights and stoichiometry provide the tools necessary to carry out reaction calculations and quantitative analysis. Also includes solution chemistry (mechanism preparation acid-base and redox), corrosion and the behavior of gases, liquids and solids. Laboratory exercises are designed to teach safe working techniques and correct attitude, and include analysis and aqueous reactions.

CHEM 2220 (CHEM 220) Organic Chemistry for Plastics—Surveys the wide field of organic compounds. Starting with hydrocarbons, a firm foundation of organic structure and naming is established, typical reactions are described. Derivatives of hydrocarbons (alcohols), halides, phenols, carbonyl compounds, carboxylic acids and derivatives, esters, amides, acid chlorides and anhydrides, are presented. Naming, structure, reactions and involvement in the plastics industry is emphasized. Knowing the structure of commercial plastic materials, a correlation is made between their physical properties, intermolecular forces and end-use requirements.

CHEM 3320 (CHEM 320) Polymer Chemistry and Technology—The different ways in which plastics behave during processing and in service performance depend on the polymer which is present; additives and copolymers modify this behavior. CHEM 3320 shows how these variables are related to the chemical structure of the polymer by exploring many commercial examples of condensation and addition polymers. Lab work involves the use of safe techniques in a series of polymer preparations, analyses, identifications and characterizations.

CHSC 1105 (CHSC 105) Engineering Materials 1—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 1262 (CHSC 262) Engineering Materials for Plastics Technology—See CHSC 1105.

CHSC 2205 (CHSC 205) Engineering Materials 2—Continuation of CHSC 1105.

COMM 1149 (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 techniques of technical writing, and research and employment application techniques. They write technical memos, letters and descriptions, and give an oral report.

COMM 1163 (TCOM 118) Technical Writing for Robotics—Emphasizes clear, correct, concise technical writing for the robotics 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 learn how to prepare content and design visuals, and deliver technical briefings.

COMM 1594 (TCOM 594) Communication for IETE—Emphasizes practical communication skills for those in technical fields and "English Across the Curriculum" applications.

COMM 2449 (TCOM 210) Technical Communication—In this course, students apply techniques from COMM 1149 to produce a project proposal, evaluation or comparison report, a progress report and a major formal report. Meetings, interpersonal communication techniques, and oral reports are an integral part of this Term 4 course. Prerequisite: COMM 1149.

COMM 2460 (TCOM 216) Advanced Technical Communication for CAD/CAM—This course emphasizes more advanced writing for the CAD/CAM industry. Students write a resume and application letters, and hold interviews for industry employment. They also prepare proposals, reports, oral briefings and documentation describing the CDCM 4490 project. They prepare for and conduct meetings. Students enrolled in this course must be concurrently enrolled in CDCM 4490.

COMM 2462 (TCOM 217) Technical Communication for Plastics—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 report. They also present an oral technical report. Prerequisite: COMM 1149.

COMM 2463 (TCOM 218) Advanced Technical Writing/Robotics—In lectures, students are introduced to advanced technical writing techniques and principles. In labs they write industry-oriented reports and give technical briefings. They prepare proposals, progress reports and documentation describing the project designed and produced for ROBT 4490. Students also write a resume and application letter and prepare for and hold meetings and interviews. Students enrolled in COMM 2463 must be concurrently enrolled in ROBT 4490. Prerequisite: COMM 1163.

ELEX 1105 (ELEX 100) Circuit Analysis 1—Teaches the principles and methods of analysis related to DC circuits. Topics include SI units and terminology, voltage, current, work, energy, power and resistance. Methods of analysis include mesh, superposition, nodal, Thevenin and Norton. Transients in RC and RL circuits are analyzed. Average and RMS values for sinewaves and rectangular waves are calculated. Labs are synchronized with lectures so that theory is studied and confirmed by application.

ELEX 1115 (ELEX 102) Digital Techniques 1—Begins with a description of the fundamental theory of the decimal and binary number systems followed by the binary (two states or levels) concept and the description of binary variables as related to mechanical switches. Various digital logic circuits are discussed and their truth tables and Boolean output equations are generated. Various logic sources are defined and interfaced to combinational logic circuits comprised of electronic logic gates. A TTL data book will be utilized to facilitate combinatorial logic circuit design. Boolean identities and Karnaugh mapping will be used to minimize algebraic expressions. Combinational digital logic will be designed and constructed implementing NAND and NOR gates using their proper Demorgan's equivalent logic symbols (Duality of Gates). Encoders and decoders will be introduced if time permits.

ELEX 2105 (ELEX 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, coupled circuits. The circuit theory is verified using multimeters, sine wave generators and dual trace oscilloscopes.

ELEX 2115 (ELEX 202) Digital Techniques 2—Builds on the knowledge gained in ELEX 1115. Studies the utilization of logic gates in larger combinational circuits such as magnitude, comparators, etc.; digital arithmetic and associated hardware; sequential logic devices such as D, J-K and T; flip-flops counters, shift registers and their application to systems such as frequency counters and parallel/serial data manipulation circuits; gathering and comprehension of electrical specifications from data books; noise margins; propagation delay and loading considerations. Interfacing techniques to discrete devices, analog and digital data multiplexing, bus structures and techniques, and an introduction to solid state memory devices.

ELEX 2120 (ELEX 203) Electronic Circuits 1—Explains how electronic circuits work, how to analyze, 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; DC power supplies and characteristics, and application of switching devices.

ELEX 2125 (ELEX 205) "C" Programming—An introductory course in microcomputer use, DOS operating system, programming languages, compilers and interpreters. The IBM personal computer is used throughout this course for interactive student training. The main part of the course covers "C" programs for engineering applications. Students will also learn to document and debug software, and to utilize available software libraries.

ELEX 2835 (ELEC 255) Instrumentation for Mechanical—TBA

ELEX 2840 (ELEC 256) Instrumentation for Mechanical Systems/Plastics—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.

ELEX 2845 (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.

ELEX 3205 (ELEX 341) Data Acquisition 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.

ELEX 4335 (ELEX 460) Feedback Systems—An introduction to linear feedback theory and practice as applied to motor position and speed control. Topics include block diagram representation and block diagram reduction of closed-loop systems; the characteristics and transient behavior of closed-loop control systems. Classification of systems into type, sensitivity to parameter variation, and system stability. Design of compensated motion control systems based on the Root Locus method and the Frequency Response method are discussed. The Z-Transform is introduced as an aid in the design of digital rather than analog controllers. Students use engineering software to aid them in problem-solving. Both analog and digital motion control systems are designed, assembled and tested.

MANU 3310 Material Removal Processes—Material removal processes will be evaluated based on their relative merits and the priorities of each process will be examined. Students will receive hands-on knowledge of various machine tools used for metal removal. Prerequisite: MECH 1210.

MANU 3312 (MECH 304) Computer Aided Manufacturing—Programming and operating procedures of Computer Numerical Control (CNC) machine tools will be investigated in this course. Part and machine setup procedures will be examined and proved on BCIT's CNC equipment. Computer Aided Manufacturing (CAM) techniques for programming will be studied in depth.

MANU 3314 (MECH 413) Tool Design—This course examines the design of special purpose tooling, process planning, design considerations of various types of jigs, fixtures, gauges, metal cutting dies, feed mechanisms, presses, scrap strip-layout and

the use of standard tooling components. AutoCAD and Carr Lane tool design assistance software will be utilized. Prerequisite: MECH 2200, 2205.

MANU 3316 (MECH 325) Advanced Materials—Students will investigate non-traditional materials currently found in modern manufactured equipment. These include plastics and composites and their forming processes. Prerequisite: CHSC 2205, MECH 1210.

MANU 3318 (ROBT 311) CNC Programming—The operation and application of computer numerically controlled (CNC) machine tools to manufacturing industries is investigated. Programming of CNC milling machines and lathes using manual and Computer Aided Manufacturing (CAM) methods will be studied. Prerequisite: MECH 1210, CDCM 1105.

MANU 3410 (MECH 444) Metrology—Includes measurement of surface texture and flatness, optical and electrical comparators, metrology of screw threads, precision measuring instruments, fundamentals of inspection and mass production gauging.

MANU 3418 (ROBT 402) Computer Integrated Manufacturing—Teaches the use of a microcomputer-based CAD system. Programming the operation of CNC machine tools using manual and computer-assisted methods is also covered in depth. The integration of Computer Aided Design and Manufacturing is investigated.

MANU 4410 Material Joining Processes—Methods of material joining including soldering, brazing and various welding processes will be investigated. This course will give the students hands-on experience with these joining processes.

MANU 4412 Production Planning—The relative merits of manufacturing processes will be examined. Process plans for manufactured parts requiring multiple processes will be developed. The economics of manufacturing processes will be analyzed.

MANU 4450 Automated Manufacturing—Techniques and equipment used in the automation of the manufacturing process are investigated. Robotics, automated part feeding mechanisms, programmable logic controllers (PLC's) and automated inspection techniques will be examined.

MANU 4490 (MECH 445) Manufacturing Projects— Students work in conjunction with an engineering company to solve problems that local industry has encountered. Generally this will encompass the design and manufacture of specialized equipment using AutoCAD, SmartCAM, conventional and CNC machine tools.

MATH 1341 (MATH 134) Basic Technical Math 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 1491 (MATH 149) 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 strong emphasis on illustrating the mathematics with applications from technology, engineering and the physical sciences.

MATH 2341 (MATH 234) Calculus for Robotics—The derivative, differentiation rules, applied maxima/minima and implicit differentiation with applications to robotics 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, evaluation of Fourier coefficients and line spectrum.

MATH 2491 (MATH 249) Calculus for Mechanical—A continuation of the differential and integral Calculus which was presented in MATH 1491. Topics include Calculus of the transcendental functions; curve sketching; maxima and minima; areas and volumes; centroids and moments of inertia; calculation of work and force due to fluid pressure; functions of several variables and partial derivatives; elementary first order differential equations. There will be a strong emphasis on illustrating the mathematics with applications from technology, engineering and the physical sciences.

MATH 3341 (MATH 334) Transform Calculus for Robotics—First and second order differential equations with application to robotics technology. Step and impulse functions. Laplace transforms of functions and mathematical operations. Inverse Laplace transforms. Solutions of differential equations. Solutions of applied problems appropriate to the robotics technology. Z-transforms of discrete signals and inverse Z transforms.

MATH 3491 (MATH 349) Numerical Methods—The application of numerical methods to engineering problems is introduced. Using the BASIC language, the algorithms are programmed and used in applied problems. Matrix methods and their application to computer graphics, linear programming and other applied mathematics problems are presented.

MATH 4491 (MATH 449) Statistics/Quality Control—The application of basic statistical principles and techniques to industrial quality control is emphasized in this course. Topics include descriptive statistics (Pareto and CE analysis), the Hypergeometric, Poisson, Binomial and Normal probability models; an introduction to hypothesis testing, tolerances and fits; sampling distributions, basic capability analysis and design of acceptance sampling plans, use of Mil-Std 105E risks in sampling, use and interpretation of control charting for x-bar and R or s, and statistical process control (SPC). MATH 4491 provides a sound foundation for students hoping to eventually challenge the American Society for Quality Control's Certified Quality Technician and Engineer examinations.

MATH 4602 (MATH 460) Mathematics for CAD/CAM—Geometric modelling including cubic splines, bezier curves and surface patches. Matrix approach to transformations. Raster 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.

MATH 5941 (MATH 594) Basic Mathematics IETE—A first-year math course covering skills necessary for teaching mechanical, electronics and technology courses at the secondary level.

MECH 1100 (MECH 100) Engineering Graphics 1—Techniques for 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, with emphasis on orthographic projection, auxiliary views, dimensions and working drawings.

MECH 1105 (CDCM 102) CAD Graphics 1—Computer-aided design using commercially available software. Includes an introduction to hardware requirements, operating systems, file handling and CAD concepts. CAD skills include element placement and manipulation, view control, measurement, text, dimensioning and plotting.

MECH 1110 (MECH 106) Production Processes 1—A basic orientation course which provides the student with practice in metal removal and metal joining and a study of related theory.

MECH 1120 (MECH 107) Introduction to Thermal Processes—Introduction to heat and fluid processes, steam tables, first law of thermodynamics. Basic steam power and refrigeration cycles.

MECH 1140 (MECH 104) Statics—Vectors, force systems, concurrent and coplanar, non-concurrent 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 1170 (CDCM 101) Computer Applications—Introduction to computer science and programming using popular commercially available spreadsheet software. Emphasis will be on engineering problems using structured problem-solving techniques. Introduction to DOS and BASIC programming.

MECH 1210 (MECH 225) Manufacturing Processes—An orientation course covering the basics of major manufacturing methods used today. Topics include metal cutting, welding, forming, casting, plastics processing, methods of numerical control and robotics programming as well as methods of measurement and inspection. The course addresses the principles upon which modern manufacturing processes are based.

MECH 2200 (MECH 220) Engineering Graphics 2—Advanced engineering graphic techniques including sections, isometrics, intersections, developments, single line pipe drawings, structural steel and connections, dimensional limits, tolerances and fits. Course work leads to specific engineering drawing assignments developed according to the student's program. Computerized drafting techniques may be used where appropriate. Prerequisite: MECH 1100.

MECH 2205 (CDCM 202) CAD Graphics 2—Continuation of MECH 1105. Advanced 2D drafting techniques, blocks, attributes, macro commands and menu customization. Introduction to 3D graphics modelling; wireframe, surface and solid models. Relationship of CAD software to other computer programs. Prerequisite: MECH 1105.

MECH 2210 (MECH 211) Production Processes 2—Evaluation of machine tool operations, organized processing, break even points and equal cost quantities, productivity and cost estimating. Machine tool specifications, testing and evaluation, and precision measurement.

MECH 2240 (MECH 206) Strength 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 2245 (MECH 208) 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. Introduction to mechanisms. Prerequisite: MECH 1140.

MECH 2310 (MECH 325) Manufacturing Processes 2—Machine tool operation, production processing and economics, evaluation of production features and equipment maintenance. Prerequisite: MECH 1210.

MECH 2350 (MECH 320) Fluid Power 1—Provides an understanding of pneumatic and hydraulic 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 2355 Fluid Power 1 (Robotics)—This course gives an understanding of pneumatic and hydraulic systems found in automated manufacturing 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 3315 (MECH 304) Manufacturing Processes 3—A study of hot and cold fabrication processes, materials and machines, quantities/costs will be investigated. An introduction to CNC programming by both manual and punched tape input.

MECH 3320 (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 3325 (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. Prerequisite: MECH 1140.

MECH 3340 (MECH 301) Machine Design 1—An introductory course in machine design, with emphasis on elementary design and analytical procedures for machine components. The course covers theories of failure, combined stresses, stress concentration, fatigue phenomena, welded and threaded connections, shafts, belt drives, geometric and force relationships in spur gearing. Problems are handled in both SI and Imperial units.

MECH 3345 (MECH 330) Computer Aided Engineering (CAE)—Computer Aided Engineering (CAE) analysis techniques such as 3D solid modelling, surface modelling and finite element methods (FEM) are discussed. Linear stress analysis in 2D and 3D are done by both the classical and the FEM approaches. Commercial FEM software packages are used for analysis and problem-solving. Prerequisite: Math 2491. Corequisite: Mech 3340 must be taken concurrently with Mech 3345.

MECH 3440 Mechanical Equipment—A study of mechanical transmissions using belts, chains and gear reducers in drive configurations, along with associated components and ancillary systems from an application, specification, selection, maintenance and safety point of view.

MECH 3450 (MECH 420) Fluid Power 2—Provides an understanding of hydraulic systems and associated electronic controls. 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, maintenance and troubleshooting are also covered. Prerequisite: MECH 2350.

MECH 3455 (MECH 421) Fluid Power 2 (Robotics)—Provides an understanding of hydraulic 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. Electronic control of fluid power systems is included. Prerequisite: MECH 2355.

MECH 3460 (MECH 460) Engineering Economics—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.

MECH 4420 (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. Energy management. Prerequisite: MECH 3320.

MECH 4425 (MECH 466) Fluid Systems—Dimensionless parameters. Pump characteristics, operation and maintenance. Cavitation. Air movement and supply, fan performance and characteristics, duct sizing and networks. Prerequisite: MECH 3325.

MECH 4440 (MECH 401) Machine Design 2—The sequel to MECH 3340, this course covers couplings, brakes and clutches; anti-friction and journal bearings; helical, bevel and worm gearing; power screws, springs and machine frame components; and an introduction to mechanical vibration with emphasis on critical speeds of rotating bodies. An introductory treatment of bulk material handling systems is also included. Problems are handled in both SI and Imperial

MECH 4490 (MECH 463) Design Projects—This course provides students the opportunity of developing engineering solutions to current industrial problems. Students are introduced to CAE methods using finite element analysis and other engineering software. Students work individually or in teams to analyze industry sponsored projects and prepare solutions through drawings, calculations and design application software.

MSYS 2380 (MSYS 303) Interpretation of Building Construction—Principles and practices of light building construction encompassing a study of building components and drawings. Students will produce a basic set of architectural drawings to demonstrate their understanding of building design and construction.

MSYS 3380 (MSYS 302) Air Conditioning 1—Heat transfer as applied to building construction including solar effect, calculation of cooling loads for single space and zoning of buildings. Use of psychrometric charts for air conditioning cycles, by-pass factor and cooling coil selection. Introduction to all-air systems with computer applications.

MSYS 3384 (MSYS 307) Heating and Ventilating 1—A study of residential warm air heating systems, components, controls, heat recovery and cooling systems. Topics will be applied to system design, selection of equipment and preparation of working drawings. Introduces alternate energy sources, solar heat systems and heat pumps. Covers the principles and practices of heat transfer and occupant comfort in buildings. Applications will be applied to preparing a heating load estimate.

MSYS 3388 (MSYS 304) Plumbing—B.C. plumbing code, basic engineering principles related to the plumbing field, graphic presentations in plumbing system design, load/demand calculations, piping methods, sizing of system components for water distribution and storm and sanitary drainage.

MSYS 4440 (MSYS 404) Mechanical Systems—A continuation of MECH 3440 which includes special interest areas related to the Mechanical Systems field. The course expands into such areas as piping specialities and WHMIS. Field trips to local companies are incorporated to demonstrate the various systems. Prerequisite: MECH 3440.

MSYS 4460 (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 "labour calculator," for ductwork, potable water, drainage and hydronic heating systems.

MSYS 4465 (MSYS 405) Maintenance Management —An introduction to the management and administration of basic maintenance practices, organization, planning, scheduling, control and reporting with emphasis on preventive maintenance. Typical maintenance software is used in labs/tutorials to produce preventive maintenance schedules, work orders, inventories and other maintenance related schedules and reports.

MSYS 4480 (MSYS 402) Air Conditioning 2—Selection of air conditioning equipment, fans, air outlets, refrigeration devices, control of air conditioning systems and cost analysis by computer software. Course includes sound propagation and transmission of vibration, sound absorption and vibration isolation. Prerequisite: MSYS 3380.

MSYS 4484 (MSYS 407) Heating and Ventilating 2—A study of basic commercial air heating and ventilating components, ductwork systems, and controls. Covers the principles and practices of hydronic heating systems. Encompasses building zoning, piping systems, boilers, products of combustion removal, combustion air, gaseous fuels, controls, with an overview of steam heat systems and energy cost estimating. Applications will be applied to preparation of designs and drawings. Prerequisite: MSYS 3384.

MSYS 4488 (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. Prerequisite: MECH 3325.

OPMT 1182 (OPMT 182) Total Quality Management—This is an introductory level course focusing on continuous improvement, quality assurance and plant layout. QA will include concepts of quality and reliability, quality planning, I.S.O. standards, QA in engineering, production and purchasing, documentation, auditing, and the human and legal aspects of QA.

OPMT 1183 (OPMT 183) Industrial Engineering for Robotics—Surveys the general background of operations management in terms of planning and organizing manufacturing operations. Topics include facility location and layout, methods improvement and production/inventory management.

OPMT 1411 (OPMT 411) Production Management—Emphasis is on the general background of production management in British Columbia companies. Covers planning and organizing for manufacturing a product. Manufacturing environments such as make-to-stock and make-to-order are examined from the production planning, inventory management and scheduling perspective. Topics such as MRP and JIT are covered in detail. Emphasis in the course is on the types of decisions a production manager must make and on the trade-offs involved.

OPMT 1460 (OPMT 460) Industrial Engineering—Covers problem-solving, decision-making and operations management approaches to project installation. Topics include critical path methods for planning and scheduling, allocation and control of project resources, productivity improvement and operations management techniques.

PHYS 1162 (PHYS 215) Physics for Plastics Technology—This introductory course deals with basic concepts in linear and rotational kinematics/dynamics, electricity and magnetism and solid state physics. General problem-solving skills are emphasized and concept applications are discussed. Data acquisition and analysis are stressed in the laboratory.

PHYS 1163 (PHYS 108) Physics for Robotics Technology—This course emphasizes topics of special relevance to robotics. Part 1: measurement and data analysis. Part 2: basic mechanics, including static equilibrium, work, energy, power, torque and rotational motion. Part 3: electrical fields, electrical potential and basic electrical properties of materials. Part 4: semiconductor physics including the theory, construction and operation of semiconductor devices.

PHYS 2149 (PHYS 216) Physics for Mechanical—A general level course covering the elements of wave motion, sound, light, basic electricity and magnetism.

PHYS 2163 (PHYS 208) Applied Physics for Robotics Technology—This course emphasizes topics of special relevance to robotics. Part 1: magnetics and electromagnetics with applications to robotic pickup systems and stepper motors. Part 2:

thermal energy and thermodynamics. Part 3: advanced mechanics with special emphasis on mechanical properties of matter, 3D force systems, stress and vibration. Prerequisite: PHYS 1163.

PLAS 1110 (PLAS 100) Plastics Technology 1—This is a general introduction to plastics technology. Information is presented on the scope of the plastics industry, the basic composition of plastic materials, health, safety and environmental considerations. The various forms of plastics and ingredients added to plastics are reviewed. The plastics families, their properties and how those properties are determined, are discussed in detail. Laboratory work complements lecture material.

PLAS 2210 (PLAS 200) Plastics Technology 2—Introduction to manufacturing processes used in the shaping and forming of plastic products. All the major processes such as injection, extrusion, blown film, expansion, compression, blow molding, casting, coating as well as fabricating and decorating processes are covered. In addition, some discussion of tooling, mold making, design and the commercial aspects of a plastics business are discussed. For each process, operating steps are reviewed. In general, the key features, advantages and disadvantages, and equipment used are presented.

PLAS 3310 (PLAS 300) Plastics Technology 3—A more in-depth presentation of thermoplastic processes, equipment, operating characteristics, process variables and their effect on product quality. Considerable time is spent learning to set up equipment and to operate it effectively. Material processing characteristics and product quality are related to laboratory studies of the rheological properties of plastics under various process conditions. Operation of production scale equipment is included. Prerequisite: PLAS 2210 or permission of instructor.

PLAS 3340 (PLAS 302) Plastics Design—Focuses on injection molds and part design. Mold components, their function, care and maintenance are covered. Mold stresses during and after injection are discussed and detailed stress calculations performed. Design rules for injection molded parts are reviewed along with the form and function of runners and gates. In general, dies and tooling are discussed. Prerequisite: PLAS 2210 or permission of instructor.

PLAS 3345 (PLAS 303) Injection Molding Analysis—This is a lab course introducing the use of MOLDFLOW software on SUNspark workstations for the analysis of plastic flow regimes in injection molds. The optimum selection of molding conditions for a given part and proper choice for part thickness, gate location, materials and a variety of other processing variables are evaluated using "MOLDFLOW" software. Prerequisite: PLAS 2210 or permission of instructor.

PLAS 3440 (PLAS 401) Fiber Reinforced Plastics—General review of fiber reinforced manufacturing processes and an introduction to composites used in the aerospace industries. Lab work includes resin systems, cure cycles, materials handling and safety; repair and finishing procedures. Prerequisite: PLAS 3310, CHEM 3320 or permission of instructor.

PLAS 4410 (PLAS 409) Plastics Technology 4—An extension of PLAS 3310, this course includes plant engineering aspects as well as material handling systems. A more in-depth review of extrusion, injection molding and blow molding processes, equipment and operating characteristics, along with specialized topics in compounding and plant locating. Prerequisite: PLAS 3310 or permission of instructor.

PLAS 4490 (PLAS 411) Plastics Project—Students select from a folio of industry sponsored projects or propose their own project. Each student or project team prepares a proposal and, once approved, presents the information to the class. Verbal and written status and final reports are presented. Students are assigned to a faculty advisor and may seek help from their peers. Emphasis is on acquiring good project management skills. Prerequisite: PLAS 3310 or permission of instructor.

ROBT 3340 (ROBT 301) Robot Applications—Discusses various robot configurations, the coordinate systems in which they operate and kinematics of robot motion. Investigates specifications such as accuracy, repeatability and load capability, and their importance in various applications. Machine elements used in automated equipment and associated machinery will be investigated.

ROBT 3350 (ROBT 302) Automation Equipment—Covers the basic principles of generators and the construction, speed-torque characteristics, braking conditions and speed control of permanent magnet DC motors. The course will also cover the operation and control of brushless DC motors and stepper motors.

ROBT 3355 (ROBT 303) Microprocessors/Interfacing—Investigates the software and hardware involved in the real-time control of a microprocessor-based system. Topics include microprocessor architecture, assembly language programming, input/output operations, interrupt handling and interfacing techniques between a computer and an automated controller. Troubleshooting techniques used in fault analysis are taught.

ROBT 3415 (ROBT 404) Computer Integrated Manufacturing—Teaches the use of a microcomputer-based CAD system. Programming the operation of CNC machine tools using manual and computer assisted methods is also covered in depth. The integration of Computer Aided Design and Manufacturing is investigated.

ROBT 4450 (ROBT 401) Robot Sensors—Investigates various methods of interfacing real-world systems to a digital computer through the use of analog-to-digital and digital-to-analog converters. Machine vision and object recognition, tactile force sensors, range finding and navigation techniques using proximity sensors, are studied.

ROBT 4490 (ROBT 403) Robotics Project—Students select a project based on some aspect of automated technology, endorsed by an industry sponsor. Each project team gives written and oral presentations on their proposed and completed design. Project management skills are emphasized in this course. Prerequisite: Enrolment in the final term.

TTED 3100 (INED 515) Teaching Design Drawing and CAD 1—The basic principles of design, relationship between design and manufacturing processes, aesthetic elements of design, design in classroom projects. 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, with a major focus on computer-aided drafting.

TTED 3110 (INED 504) Teaching Precision Measurement—The development of basic measuring skills required for success in the early parts of the program, with emphasis on teaching these skills to adolescent students.

TTED 3120 (INED 535) Teaching Product Manufacturing—The principles and systems of manufacturing and construction using wood, metal and synthetic materials. The design and planning procedures used in production. The equipment, materials and skills necessary to teach production courses using these materials at the junior secondary level. Safe use and maintenance of light and heavy machinery with adolescent students. Management of individually produced student projects. Prerequisite: TTED 3110; may be taken concurrently.

TTED 3140 (INED 575) Materials in Technology Ed 1—The study of materials commonly used in school industrial and technology education, through testing, research and experimentation. Specific

application to teaching technology courses at secondary level and integration with the objectives of technology education.

TTED 3170 (INED 506) Using Computers in Teaching—DOS operations and application programs useful in preparing lesson materials and managing a lab/shop.

TTED 4200 (INED 615) Teaching Design Drawing and CAD 2—The basic principles of design, relationship between design and manufacturing processes, aesthetic elements of design, design in classroom projects. 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, with a major focus on computer-aided drafting. Prerequisite: TTED 3100.

TTED 4240 (INED 675) Materials in Technology Ed 2—The uses of new materials and processes to solve technological engineering and design problems, with emphasis on student research projects for technology education programs. Includes the study of new systems and materials relevant to current economic development. Prerequisite: TTED 3110, 3120, 3140.

TTED 4250 (INED 650) Power and Energy for Tech Ed—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. Principles of robotic control in transmission of power. Prerequisite: TTED 3110, 3120.

TTED 4260 (INED 660) Teaching Electronics 1—The basic concepts of electronics taught at the junior secondary level. The use of experiments and projects for teaching electronics, integrating electronics into the technology education program. Electrical shop control, planning and safety. Effective use of equipment and materials. Prerequisite: TTED 3110, 3120.

TTED 4270 (INED 606) Using Computers in Teaching 2—DOS operations and application programs useful in preparing lesson materials and managing a lab/shop. Prerequisite: TTED 3170.

TTED 5350 (INED 850) Teaching Automotive Systems 1—The skills students need to master senior and career preparation, automotive shops, shop management, supervising student work on clients' cars. Prerequisite: TTED 4250.

TTED 5360 (INED 860) Teaching Electronics 2—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: TTED 4260.

TTED 5370 (INED 706) Managing Computer Labs—Advanced computer applications including configuration of software for running various programs and peripherals.

TTED 5390 (INED 505) Introduction to Tech Ed—Examines a wide range of topics related to teaching industrial and technical subjects with specific pedagogy for technical teaching. Includes observation visits to schools.

TTED 6400 (INED 715) Teaching Design and CAD 3—Applied problems in design and drafting for technology education. Prerequisite: TTED 4200.

TTED 6420 (INED 741) Teaching Metal Product Manufacture—The equipment, materials and skills necessary to teach metal materials at the senior secondary level: casting, forming, and conditioning processes; advanced and non-traditional machining; consideration of the role of the machine shop in emerging Technology Education programs. Prerequisite: TTED 3110, 3120.

TTED 6430 (INED 731) Teaching Wood/Composites Manufacture—The equipment, materials and skill necessary to teach wood and related materials at the senior secondary level. Management of large and mass-produced student projects. Prerequisite: TTED 3110, 3120.

TTED 6470 (INED 806) Managing Computer Labs 2—Advanced computer applications including troubleshooting and system configuration.

TTED 6480 (INED 875) Technical Projects for Tech Ed—Individual research project requiring the student to examine and report on the application of a technological product or process to industry, with emphasis on how the application might be used in teaching technological subjects.

TTED 6490 (INED 605) Tech Ed Applications—Examines a wide range of topics related to teaching industrial and technical subjects with specific pedagogy for technical teaching. Includes observation and activity visits to schools. Prerequisite: TTED 3190.

Faculty and Staff

T. Williams, B.Sc., M.Sc.(Mech Eng.), P.Eng., Associate Dean
E.B. Barry, B.SC
J. Bartz, Dipl. Tech.
P. Dollan, B.Sc.(Tech.)
B. Dunn, B.A.Sc
P. Esworthy, B.A.(Pol.Sci), B.E., Cert. IETE
D.C. Gerlitz, B.Sc., M.S..
A. Graham, H.N.C.
R.G. Graham, B.A.Sc., M.A.S.H.R.A.E., P.Eng., Program Head, Systems
G. Henderson, Dipl.T., ASTT
G.D. Johnson, M.I.Mech.E., C.Eng., M.I. Mfg.E., P.Eng., Program Head, Manufacturing
G. Johnson, B.A.(Geog.)
E. Kulhanek, M.Sc.
E. H.Labounty,
E. Morse, B.Sc., B.Eng., P.Eng
D. Lewis, B.A. Sc. (Mech), P.Eng., Program Head, Robotics
D. Mack, Dipl. T.
I. Mathie, B.E., M.Ed.
R. Merriam, B.Ed., M.Ed., Program Head, Industrial Ed (Teacher Ed)
P. Morrison, Dipl.T., B.Eng., A.Sc.T., Program Head, CAD/CAM
P. Paleologou, M.Eng. (Elec.)
J.E. Pretzlaff, Dipl.T.
J. Read, Dipl.T.
H. Rienks, Dipl.T., A.Sc.T.
J. Smith, B.A.Sc., P.Eng.
V.M. Strijack, B.Sc., P.Eng., Program Head, Common First-Year Studies
G. Thiessen, Dipl.T.
P. Trant, B.Ed., M.A.
P. Van Hulsen, B.Sc., Dipl.T.
D.F. Wilson, Ph.D., Program Head, Plastics
K. Wong, B.A.Sc., M.A.Sc., P.Eng., Program Head, Design

MINING

Diploma Program

The Industry
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. Gross profits and total numbers employed indicate the mining industry still commands a major position in B.C. Copper, zinc, gold and coal production predominate. Industrial mineral production is expanding. Mining is a worldwide industry. The workplace varies from offices to tents, and mountains to cities.

There is strong industry support. The advisory committee, composed mostly of industry representatives, meets twice annually to review the program. Field schools, guest lecturers, project sponsorship, professional associations and conventions provide opportunities for the student to interface with the mining world.

The Future
As long as civilization needs metals, ceramics and building materials, graduates will enter a wide field of mining and related occupations: geology, geophysics, geochemistry, surveying, sampling, assaying, mine planning, environmental control, production supervision, services (e.g. water control, road construction), rock mechanics, diamond drilling, blasting, equipment sales and computer applications. Independence, initiative, and a sense of responsibility are important. Salaries and benefits are high.

Economics
BCIT mining students enjoy an unusually high level of student financial assistance. There are several entrance scholarships available.

The Program
The curriculum is current, practical, intensive, and broad-based. Graduates are career-oriented.

Program Length
Two years full-time beginning in September each year.

Total Fees (subject to change—does not include book or supply costs)
$3,965.30 for the two-year program (1993/94).

Degree Transfer/Completion
There are good transfer arrangements with several universities and approximately 70% of our students ultimately continue to engineering degrees.

Accreditation
The program is accredited by the Applied Science Technologists and Technicians of British Columbia.

Prerequisites
High school graduation with English 12, Math 12 and either Physics 11 or Chemistry 11, are course requirements for this program.

Program: MINING

			Clrm Hrs/wk
Level 1			
CHEM	1102	Chemistry 1 for Mining/Petroleum	6.0
COMM	1135	Introduction to Technical Communication	3.0
MATH	1501	Basic Technical Mathematics for Mining	5.0
MINE	1101	Introductory Geology	3.5
MINE	1102	Mining Exploration	2.0
MINE	1103	Introduction to Computers	1.0
MINE	1108	Graphical Communication	2.0
PHYS	1147	Physics for Mining/Petroleum 1	6.0
SURV	1140	Surveying for Mining 1	3.0
Level 2			
CHEM	2202	Chemistry 2 for Mining/Petroleum	6.0
COMM	2250	Technical Communication for Mining	3.0
MATH	2501	Calculus for Mining	5.0
MINE	2101	Physical Geology	4.0
MINE	2102	Mining Methods	2.0
MINE	2108	Mine Drafting and Computer Graphics	2.0
PHYS	2147	Physics for Mining/Petroleum 2	6.0
SURV	2240	Surveying for Mining 2	3.0
Level 3			
CHSC	3305	Assaying	4.0
CHSC	3314	Mineral Processing	3.5
CIVL	1220	Statics and Strength of Materials	3.0
COMM	3350	Advanced Technical Communication for Mining	2.0
MATH	3501	Numerical Methods and Computing	5.0
MINE	3101	Structural Geology	3.5
MINE	3102	Blasting and Rock Mechanics	4.0
PHYS	3150	Mining Geophysics	3.0
SURV	3340	Surveying for Mining 3	3.0
Level 4			
CHSC	4405	Assaying 2	4.0
CHSC	4414	Mineral Processing 2	3.5
CIVL	2221	Strength of Materials (1/2 term course)	3.0
CIVL	2222	Geotechnical for Mining (1/2 term course)	3.0
CIVL	2223	Hydraulics	3.0
COMM	4450	Advanced Technical Communication for Mining	2.0
MATH	4501	Numerical Methods/Statistics	5.0
MINE	4101	Mineral Deposits	3.5
MINE	4102	Mine Planning	4.0
SURV	4440	Surveying for Mining 4	3.0

Course Descriptions
CHEM 1102 (CHEM 101) Chemistry 1 for Mining/Petroleum—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 2202 (CHEM 201) Chemistry 2 for Mining/Petroleum—A continuation of CHEM 1102 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.Lab work covers qualitative and quantitative analysis and physio-chemical separations.

CHSC 3305 (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 3314 (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: grinding, screening, gravity separation, cyclone classification, flotation, sedimentation, thickening, filtration. Emphasis on numerical solution of operating and design problems. Course includes laboratory work.

CHSC 4405 (CHSC 405) Assaying 2—A continuation of CHSC 3305. Also, environmental chemistry, acid generating potential.

CHSC 4414 (CHSC 414) Mineral Processing 2—A continuation of CHSC 314. Prerequisite: CHSC 3314.

CIVL 1220 (CIVL 339) Statics and Strength of Materials—The definitions, representations and uses of forces and moments are presented, leading to the equations of equilibrium. Topics include: free bodies, trusses, stresses, shear and bending moment diagrams.

CIVL 2221 (CIVL 443) 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. Prerequisite: CIVL 1220.

CIVL 2222 (CIVIL 444) Geotechnical for Mining—Study of environmental aspects of tailings dam disposal, quantity take off for feasibility and pond life. Optimization of pond sites. Longterm monitoring of pond and dam. General geotechnical topics including soil mass/volume composition classification, compaction, permeability, pore pressures and shear strength. Prerequisite: CIVL 2221.

CIVL 2223 (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 1220.

COMM 1135 (TCOM 101) Introduction to Technical Communication—This course covers basic writing and speaking skills needed for communicating technical information in industry. Students learn how to organize messages, illustrate documents, define and describe mechanisms and processes; write memos, letters and instructions. Students also prepare and deliver oral presentations.

COMM 2250 (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: COMM 1135.

COMM 3350 (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 reports, illustration techniques and technical briefings. Prerequisite: COMM 1135, 2250.

COMM 4450 (TCOM 404) Advanced Technical Communication for Mining—In this course students update their job search packages and write advanced analytical reports and proposals which emphasize environmental conflicts, management techniques, and conflict resolution. They also write more complex letters. As much as possible, assignments are integrated with students' other courses. Prerequisite: COMM 1135, 2250, 3350.

MATH 1501 (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 2501 (MATH 250) Calculus 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. Prerequisite: MATH 1501.

MATH 3501 (MATH 350) Numerical Methods and Computing—Microsoft Quick BASIC will be used to solve selected problems related to the Mining Technology. The next part of the course will be used to introduce Critical Path Scheduling and Leveling of Resources. The last topic is the Hardy Cross for analyzing nonlinear flow distribution of fluids.

MATH 4501 (MATH 450) Numerical Methods/Statistics—An introduction to linear programming using the Simplex method and Transportation algorithms. Most of the time will be spent on an introduction to statistics and geostatistics. Topics include estimation, hypothesis testing, regression and correlation, semivariograms and kriging.

MINE 1101 (MINE 101) Geology—Definition, basic concepts, earth's crust, geologic time; atomic structure of minerals, crystal forms and symmetry systems; properties of common minerals, sedimentary rocks, clastic and chemical sediment; igneous rocks, deformation of earth's crust; metamorphic rocks.

MINE 1102 (MINE 102) Exploration—An introduction to mining generally 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, geology, geophysics, sampling and diamond drilling. Maps, photos, reports and references, economics and planning.

MINE 1103 (MINE 103) Introduction to Computers —Provides a practical understanding of MS-DOS which will allow students to manipulate files and run some application programs. The course is competency-based with a series of evaluations. Topics include computer system components, disk preparation, file creation and movement, directories and hard-disk management, and file editing. A secondary objective for more progressive students will be an introduction to Lotus 1-2-3 spreadsheets.

MINE 1108 (MINE 108) Graphical Communication—Students learn to produce freehand engineering style sketches using only basic field type instruments. They learn general conventions for scales, orientation, dimensioning, orthographics and perspectives. Exercise applications include surveying, geological, mining and civil engineering topics.

MINE 2101 (MINE 201) Geology—Deformation of earth's crust, folds, faults; 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 1101.

MINE 2102 (MINE 202) Mining Methods—A full description of mining methods with 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 1102.

MINE 2108 (MINE 208) Mine Drafting and Computer Graphics—Enables students to apply computer drafting fundamentals to the solution of mining problems. Exercise applications include surveying, geological, and mine engineering topics.

MINE 3101 (MINE 301) Structural Geology—Brief review of mechanical principles of rock deformation and 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 examination of specimens, methods of recording structural data, mapping and solution of structural problems, with emphasis on economic aspects. Prerequisite: MINE 2101.

MINE 3102 (MINE 302) Blasting and Rock Mechanics—Blasting products, initiation systems, underground and open-cast applications and design, control blasting, safety, field labs. Rock mechanics: rock-mass classification and field observations, rock mass strength determination, stress field description, modes of failure, ground water effects, ground control methods (slope stability, support, stope design), ground movement monitoring. Prerequisite: MINE 2102.

MINE 4101 (MINE 401) Mineral Deposits—The terminology, classification, 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, Field trips are correlated with all classroom work in geology. Prerequisite: MINE 2101.

MINE 4102 (MINE 402) Mine Planning—Geological, ore reserve, mine modelling, mine economics: cutoff grades, waste/ore ratios, capital and operating cost estimation, taxation, marketing, ore schedules, cash-flow and present value, and rate-of-return projections. Services: mine ventilation, electrical distribution, compressed air, materials handling systems, reclamation and pollution control. Prerequisite: MINE 3102.

PHYS 1147 (PHYS 101) Physics for Mining/Petroleum 1—Basic concepts and calculations in the mechanics of particles, solids and fluids which serve as a foundation for later studies in this technology. The laboratory deals with the principles of measurement and the experimental method of acquiring knowledge.

PHYS 2147 (PHYS 201/204) Physics for Mining/Petroleum 2—A general level course covering thermal properties of matter, waves, electricity, magnetism, electromagnetism and atomic and nuclear physics. The lab component is an introduction to the uses of geophysics in the search for ore deposits. Lectures, case study exercises and labs cover the gravity, magnetic, resistivity, radiometric and seismic methods of analyzing the physical properties of the earth. Prerequisite: PHYS 1147.

PHYS 3150 (PHYS 304) Mining Geophysics—Consists of fieldwork, case studies and 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. Prerequisite: PHYS 2147.

SURV 1140 (SURV 140) Surveying for Mining 1—Substance of course is 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; plane table; 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 2240 (SURV 240) Surveying for Mining 2—See SURV 1140.

SURV 3340 (SURV 340) Surveying for Mining 3—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 4440 (SURV 440) Surveying for Mining 4—A continuation of SURV 3340. The content is the same.

Faculty and Staff

J.T. Neilson, B.A.Sc., P.Eng., Associate Dean
F.R.K. Edmunds, B.A., M.Sc., Ph.D, Program Head
J.F. Fairley, B.A.Sc., P.Eng.
M. Gendron, Dipl. T.

Advisory Committee Members

R. Elliott, Ireco Canada Ltd., Chairman
J. Anderson, Teck Corporation
D.M. Bohme, INCO Exploration & Technical Services Inc.
R. Conte, Ministry of Energy, Mines and Petroleum Resources, B.C.
D. Jennings, Quartz Mountain Gold Corporation
J. Meech, University of British Columbia
J. Patterson, B.C. Yukon Chamber of Mines
S. Rothman, Highland Valley Copper Corp.

NONDESTRUCTIVE TESTING

Intermediate Certificate Program

The BCIT program leading to an Intermediate Certificate of Technology in Nondestructive Testing is aimed at satisfying industry requirements for Certified Nondestructive Testing Technicians. Prospective students should note that this program is offered in both a part-time, night school format and in a concentrated full-time, 20-week format in which the student attends day classes.

Both the day and night school programs include courses in all standard NDT methods together with support courses in Metallurgy, Mathematics and Quality Assurance. The NDT courses are designed to satisfy the academic requirements for certification of NDT operators as developed by the Canadian Government Standard's Board (CGSB). However, before obtaining CGSB certification in any NDT method, a student must also obtain practical work experience and pass a government examination.

Job Opportunities

Graduates are expected to work as NDT technicians with specialty NDT companies and with a wide variety of manufacturing, aeronautical, chemical process and equipment maintenance firms.

Program Length

20 weeks full-time beginning in September each year. Part-time courses are offered throughout the year. Consult our tabloids for details.

Total Fees (subject to change—does not include book or supply costs)

$1,004.15 for the full-time program (1993/94).

Prerequisites

High School graduation with Math 11 and English 12, plus Trades Training or experience. Suitable trades include Welding, Pipefitting, Ironworking, Boilermaking, Aeronautical Trades, Millwright, Machinist, previous NDT.

Program: NONDESTRUCTIVE TESTING

A. 15 weeks September—December

		Credits
CHSC 1156	Metallurgy	9.0
CHSC 2280	Special NDT Procedures	3.0
COMM 1139	Communication Nondestructive Testing	4.0
MATH 1301	Technical Mathematics for NDT	7.0
NDTE 1169	NDT Radiography Level 1	3.0
NDTE 1170	NDT Ultrasonics Level 1	3.0
NDTE 1172	Magnetic Particle & Liquid Penetrant Testing 1 & 2	3.0
NDTE 2269	Radiography Level 2	4.0
NDTE 2270	NDT Ultrasonics Level 2	3.0
NDTE 2271	NDT Eddy Current 1 & 2	3.0

Course Descriptions

CHSC 1156 (CHSC 156) Metallurgy— Includes casting and forming of metals, heat treatment, physical testing, and metallurgy of welding. Lab work in metals testing, metallography, heat treatment and corrosion constitutes approximately half the course.

COMM 1139 (COMM 101) Communication Nondestructive Testing— This course will teach you how to communicate quickly, clearly and effectively. You will learn practical writing techniques including correct formats for instructions, process descriptions, correspondence and some short informal reports. You will also complete a resume and letter of application.

MATH 1301 (MATH 130) Technical Mathematics 1 for NDT— A review and application of algebra functions and graphs in Cartesian and Polar Coordinates in two and three dimensions: trigonometry of right and general triangles, graphs of trigonometric functions, vectors and applications, logarithmic and exponential functions, growth and decay, decibels, plotting graphs with logarithmic scales. A short introduction to descriptive statistics may be included if time permits.

NDTE 1169 (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-GP-4M, condition (b).

NDTE 1170 (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 requirement of CGSB Standard 48-GP-7M, condition (b) for

NDTE 1172 (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) Levels 1 and 2.

NDTE 2269 (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, code standards, specifications and procedures. Prerequisite: CHSC 1169 or be a Certified Level 1 Radiographer.

NDTE 2270 (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 1170 or be a Certified Level 1 Operator.

NDTE 2271 (CHSC 171) NDT Eddy Current 1 & 2—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-GP-13M for Levels 1 and 2 classroom training.

Faculty and Staff

J.T. Neilson, B.Sc., P.Eng., Associate Dean
J. Berry, B.Sc., Ph.D., Program Head
D. McLeod, A.R.M.T.C., M.I.M.
R. Pike

Advisory Committee Members

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K. Kaye, Ministry of Municipal Affairs Recreation & Housing
M. Koestlmaier, Ebco Industries Ltd.
T. McLean, Industrial Nondestructive Testing Ltd.
F. Pfeiffer, Canadian Airlines International Ltd.
G. Sale, Prism Systems Incorporated
G. Sieben, Coast Testing
D. Stasuk, Stasuk Testing & Inspection Ltd.
S. Salter, Quality Management Institute

PETROLEUM AND NATURAL GAS

Diploma Program

Due to its large size and diversity, the oil and gas 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 technologist is much sought after in the marketplace. There are many career choices for both men and women in industry and government, working in the office, plant and the field. There is unlimited potential for growth and success. Positions are available in the following areas:

Exploration and Production: Geologic studies, seismic surveys, reservoir studies, well testing and servicing.

Transmission and Distribution: Operation and maintenance of pipelines, systems planning, corrosion studies and control, gas control and measurement.

Manufacturing: Laboratory technologist, environmental control technologist, oil refining and gas processing operations.

Other areas include government regulatory agencies, research laboratories and petroleum products application and marketing. The need for trained personnel continues to grow.

The Program

The curriculum is designed to cover all major aspects of the oil and gas industry, thereby enabling the graduate to successfully enter any area of the industry.

The first year covers petroleum geology, reservoir behavior, oil and gas production and field handling, and gas processing. Emphasis is also given to the basic sciences—chemistry, physics and mathematics—necessary for the scientific and engineering principles involved in studies throughout the program.

The second year covers pipeline transmission, oil refining and product utilization, and gas distribution. Computer use is emphasized in process control and throughout the curriculum. Classroom and laboratory instruction are supplemented by field trips to local installations.

Program Length

Two years full-time beginning in September each year.

Total Fees (subject to change—does not include book or supply costs)

$3,965.30 for the two-year program (1993/94).

Accreditation

This program is accredited by the Applied Science Technologists and Technicians of British Columbia.

Degree Transfer/Completion

Credit is given toward a petroleum engineering degree at selected U.S. universities. Credit is also given toward a chemical engineering degree at Lakehead University.

Prerequisites

High School graduation with English 12, Math 12 and either Chemistry 11 or Physics 11 are course requirements for this program. Exemptions from academic requirements may be made in the case of mature applicants with practical experience in the industry.

Program: PETROLEUM AND NATURAL GAS

Level 1			Clrm Hrs/wk
CHEM	1102	Chemistry 1 for Mining/Petroleum	6.0
CHSC	1106	Engineering Materials Petroleum	3.5
COMM	1135	Introduction to Technical Communication	3.0
MATH	1471	Basic Technical Mathematics for Petroleum	5.0
PETR	1101	Petroleum Geology	4.0
PETR	1102	Properties of Reservoir Fluids	3.0
PHYS	1147	Physics for Mining/Petroleum 1	6.0

Level 2			
CHEM	2202	Chemistry 2 for Mining/Petroleum	6.0
COMM	2247	Technical Communication/ Petroleum	3.0
COMP	1135	Computer Applications	2.0
MATH	2471	Calculus for Petroleum	5.0
PETR	2201	Field Production of Oil and Gas	3.0
PETR	2202	Field Handling of Oil and Gas/Gas Processing	2.0
PHYS	2147	Physics for Mining/ Petroleum 2	3.0
SURV	1128	Surveying for Petroleum	3.0

Level 3			
CHEM	3310	Physical Chemistry	5.0
CHSC	3341	Unit Operations 1	6.0
CHSC	3351	Pollution Control	3.0
MATH	3471	Differential Equations or Petroleum	5.0
PETR	1308	Fuels	2.0
PETR	3306	Oil Refining	4.0
PETR	3307	Pipeline Transmission	6.0

Level 4			Clrm Hrs/wk
CHEM	4415	Petroleum Chemistry	5.0
CHSC	4441	Unit Operations 2	6.0
MATH	4471	Statistics and Numerical Methods for Petroleum	5.0
PETR	2404	Computer Simulation and Control	2.0
PETR	4403	Process Dynamics	3.0
PETR	4406	Products Testing/Utilization	5.0
PETR	4407	Gas Distribution/ Utilization	4.0

Course Descriptions

CHEM 1102 (CHEM 101) Chemistry 1 for Mining/Petroleum—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 2202 (CHEM 201) Chemistry 2 for Mining/Petroleum—A continuation of CHEM 1102 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. Prerequisite: CHEM 1102.

CHEM 3310 (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. Prerequisite: CHEM 2202.

CHEM 4414 (CHEM 415) Petroleum Chemistry—Correlates the physical and chemical properties of petroleum chemicals with their structures. Naming compounds and the production and end-use of petro-chemicals of commercial importance are emphasized. Instrumental analyses of petroleum fractions and products is covered in lectures and in practical work. Prerequisite: CHEM 2202.

CHSC 1106 (CHSC 106) Engineering Materials Petroleum—Imparts a basic knowledge of the structure, properties,

behavior and application of metals. Terminology and significance of physical testing of metals: tensile testing, hardness, impact, etc. Reasons for metal failure: fatigue, creep, embrittlement. Crystal structure of metals, properties and forming methods of metals, corrosion and nondestructive testing.

CHSC 3341 (CHSC 341) Unit Operations 1—An introduction to chemical engineering. Topics include transportation of fluids, thermodynamics, heat transfer, evaporation, distillation, liquid/liquid extraction, solid/liquid extraction, gas absorption, psychrometry.

CHSC 3351 (CHSC 351) Pollution Control—Examines the hydrocarbon processing industry: air pollution meteorology, fundamentals of waste products treatment and management systems, basic sampling and testing techniques.

CHSC 4441 (CHSC 441) Unit Operations 2—See CHSC 3341.

COMM 1135 (TCOM 101) Introduction to Technical Communication—In this course, students learn the fundamentals of clear technical writing and the principles of style and organization. They write documents relevant to the petroleum industry including technical descriptions, instructions, letters and memos. They also give an oral report.

COMM 2247 (TCOM 208) Technical Communication—Petroleum—A continuation of COMM 1135. This course focuses on technical reports of various lengths and deals with organization, format, graphics and writing strategies. Students make oral presentations, learn how to write resumes and application letters,and participate in job interviews and meetings. Prerequisite: COMM 1135.

COMP 1135 (COMP 122) Computer Applications—Introduction to the components of a computer and to programming in BASIC on personal, mini and mainframe computers. FORTRAN programming on mainframe. Problems solved via programming are in the petroleum field.

MATH 1471 (MATH 147) Basic Technical Mathematics for Petroleum—Graphical linear programming. Exponential/logarithmic theory and transformations, common and natural logarithms and logarithmic/ semilogarithmic graphs. Radian measure and its applications. Trigonometric functions of any angle, vectors and solution of triangles, graphs of trigonometric functions, identities, compound and double angles, trigonometric equations and inverse functions.

MATH 2471 (MATH 247) Calculus for Petroleum—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 areas and volumes. Tables of integrals, integration by parts and by trigonometric substitution. Prerequisite: MATH 1471.

MATH 3471 (MATH 347) Differential Equations for Petroleum—Integration using partial fraction methods. Elementary differential equations and separation of variables. Integrating factor method for first order differential equations; solutions by numerical methods. Second order differential equations. Partial differentiation. Practical applications of all of the above topics. Prerequisite: MATH 2471.

MATH 4471 (MATH 447) Statistics and Numerical Methods for Petroleum—Organization and graphical presentation of data, frequency distributions and measures of location and dispersion including mean and standard deviation. Probability theory and laws. Random variables, discrete and continuous theoretical distributions. Sampling, estimation and hypothesis testing with both large and small samples. Correlation. Linear programming using the Simplex method. Gauss-Jordan method for solving sets of simultaneous equations. Solution of algebraic and transcendental equations by iterative methods. Prerequisite: MATH 3471.

PETR 1101 (PETR 102) Petroleum Geology—Relates historical and physical geology to the formation, migration and accumulation of economically producible oil and gas fields and the basic processes required to locate and produce these accumulations. Emphasis is placed on the practical utilization of computer-based technology in this field.

PETR 1102 (PETR 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.

PETR 1308 (PETR 308) Fuels—Examines alternative conventional and substitute fossil fuels, the processes used to produce and handle such fuels, their utilization, and the advantages and disadvantages of these fuels in relation to present day conventional fuels.

PETR 2201 (PETR 201) Field Production of Oil and Gas—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: PETR 1101.

PETR 2202 (PETR 202) Field Handling of Oil and Gas/Gas Processing—Covers the handling of crude oil and natural gas from the wellhead 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. Prerequisite: PETR 1102.

PETR 2404 (PETR 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. Students will have hands-on experience with current petroleum oriented computer programs. Prerequisite: COMP 1135 or equivalent.

PETR 3306 (PETR 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 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. Prerequisite: PETR 2202.

PETR 3307 (PETR 307) Pipeline Transmission—Covers the basic skills required for a student to enter a gas transmission company. Topics include gas quality measurement, control, pipeline design and construction, corrosion control, testing, compressor station operations. Emphasis is placed on adherence to the Canadian Safety Code of Pipelines. Practical utilization of computer technology in this field is stressed. Prerequisite: PETR 2202

PETR 4403 (PETR 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. Prerequisite: CHSC 3341, MATH 2471 or equivalent.

PETR 4406 (PETR 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. Lectures examine the desired properties and specifications of these products and the equipment in which the products are used. Labs 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: PETR 3306.

PETR 4407 (PETR 401) Gas Distribution and Utilization—An introduction to the distribution and utilization of natural gas. Topics 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. Prerequisite: PETR 3307.

PHYS 1147 (PHYS 101) Physics for Mining/Petroleum 1—Basic concepts and calculations in the mechanics of particles, solids and fluids which serve as a foundation for later studies in petroleum technology. The laboratory deals with the principles of measurement and the experimental method of acquiring knowledge.

PHYS 2147 (PHYS 201/204) Physics for Mining/Petroleum 2—A general level course covering thermal properties of matter, waves, electricity, magnetism, electromagnetism and atomic and nuclear physics. The lab component is an introduction to the uses of geophysics in the search for ore deposits. Lectures, case study exercises and labs cover the gravity, magnetic, resistivity, radiometric and seismic methods of analyzing the physical properties of the earth. Prerequisite: PHYS 1147.

SURV 1128 (SURV 128) Surveying for Petroleum—Familiarizes students with the instruments and fundamental field and computational procedures which are used in the survey industry. The course covers survey theory, surveying objectives, practical applications of surveying equipment, mathematical computations and graphical representations as they apply to surveying.

Faculty and Staff

J.T. Neilson, B.A.Sc., P.Eng., Associate Dean
R.G. Kinney, Dipl.T., A.Sc.T., Program Head
D.A. Campbell, B.A., (Hons.), M.Ed.

Advisory Committee Members

E. Paterson, Imperial Oil Ltd., Chair
M.E. Bruce, BC Gas Inc.
S. Foofat, Ministry of Energy, Mines & Petroleum Resources
M. Kelly, Westcoast Energy Inc.
M. Tarr, BC Gas Inc.

Renewable Resources

Cooperative Diploma Programs

British Columbia's greatest natural renewable resource is its forest land. The benefits which derive from intelligently planned use of this land are many, varied and extremely valuable. Wise use of the land and related resources is essential for the continued survival of many industries and their dependent communities, as well as for the perpetuation of the resources themselves. The Renewable Resources programs have been established to meet these needs. Training is offered in two programs: Forestry and Fish, Wildlife and Recreation.

Job Opportunities

Graduates in the **Forestry Program** 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. Student enrolment is restricted so as to approximate the number of jobs available.

Cooperative Education

Renewable Resources has added a Cooperative Education option to both the Forestry and Fish Wildlife and Recreation programs. Students wishing to enter this option must achieve and maintain a 65% grade point average. The Coop option will require students to spend one more year in the technology to obtain an enhanced coop diploma in either discipline. For one half of this extra period of study, coop students will be employed in their field, while the other half will involve a fifth term of study. Students interested in Coop should approach their respective program heads for more information.

Cooperative education involves enhancing the educational experience by integrating traditional academic work at the Institute with relevant work experience. The benefits of participation in the program will include: skill development in the workplace environment and the potential enhancement of employment opportunities upon graduation. It is expected the coop experience will provide participants with training in tune with the specific needs of employers.

The Programs

Forestry covers forest management; botany, ecology and soils; photo interpretation and mapping; silviculture and reforestation; protection and fire management; measurements; engineering, logging production and utilization.

Fish, Wildlife and Recreation covers the management of fish, wildlife and wildland recreation and includes habitat ecology, environmental inventory techniques and environmental law with respect to these resources.

When course credits are given, electives will be chosen in consultation with the Program Head.

Accreditation

The program is accredited at the technologist level by the Applied Science Technologists and Technicians of B.C.

Prerequisites *

The following are minimum requirements: High school graduation with Math 11 with C+; English 12; a Science 11 (for F.W.R. option must be Biology 11); any one of another Science 11, or a Science 12 or Math 12. Work experience in natural resources strengthens an application for either of the programs.

* Out of province and mature student applications will be reviewed by the Associate Dean.

Program Length

Two years full-time beginning in September each year.

Cooperative Education Program adds one extra year.

Total Fees (subject to change—does not include book or supply costs)

$3, 965.30 for the two-year program (1993/94).

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 $500 for first year and $600 for second year.

Program: FORESTRY

Level 1		Clrm Hrs/wk
COMM 1145	Introduction to Technical Communication	3.0
MATH 1451	Basic Technical Mathematics for Renewable Resources	5.0
RENR 1100	Enhanced Learning Skills	0.5
RENR 1105	Natural Resource Measurement	5.0
RENR 1115	Applied Ecology in B.C. 1	5.0
RENR 1120	Introduction to Air Photos and Mapping	4.0
RENR 1125	Plant Identification	5.0
RENR 1200	Microcomputer Applications Forestry	3.0

Level 2		
COMM 2245	Technical Communication for Forestry Resources	3.0
MATH 2451	Math for Renewable Resources	5.0
RENR 2105	Forest Measurement 1	7.5
RENR 2106	Forest Measure 1 Challenge	7.5
RENR 2115	Applied Ecology in B.C. 2	5.0
RENR 2120	Photo Interpretation and Mapping 2	4.0
RENR 2130	Introduction to Soils	4.5
RENR 2135	Fire Management 1	3.0
*RENR 2140	Integrated Resource Project	40.0

* a one-week course at end of term

Level 3		
COMM 3345	Advanced Technical Communication for Forestry Resources	2.0
RENR 2155	Forest Management	4.0
RENR 2235	Technical Project and Report	4.0
RENR 3105	Forest Measurement 2	7.0
RENR 3135	Fire Management 2	3.0
RENR 3145	Silviculture 1	3.5
RENR 3150	Forest Pestology 1	3.5
RENR 3160	Forest Engineering 1	10.0

Level 4		
COMM 4445	Advanced Technical Communication for Forestry Resources	2.0
RENR 2170	Log Scaling	5.0
RENR 3150	Forest Pestology 2	5.0
RENR 3165	GIS	3.0
*RENR 3175	Independent Studies	30.0
RENR 4145	Silviculture 2	7.0
RENR 4155	Forest Administration	4.0
RENR 4160	Forest Engineering 2	87.0

* a two-week course

Program: FISH, WILDLIFE AND RECREATION

Level 1		Clrm Hrs/wk
COMM 1145	Introduction to Technical Communication	4.0
MATH 1452	Basic Technical Mathematics for Renewable Resources	4.0
RENR 1100	Enhanced Learning Skills	0.5
RENR 1105	Natural Resource Measurement	5.0
RENR 1110	Microcomputer Applications FWR	3.0
RENR 1115	Applied Ecology in B.C. 1	5.0
RENR 1120	Introduction to Air Photos and Mapping	4.0
RENR 1125	Plant Identification	5.0
RENR TBA	Microcomputer Applications for FWR	3.0

Level 2		
COMM 2253	Technical Communication FWR	4.0
FOOD 2240	Zoology	5.0
MATH 2452	Statistics for FWR	6.0
RENR 2115	Applied Ecology in B.C. 2	5.0
RENR 2120	Photo Interpretation and Mapping 2	3.0
RENR 2130	Introduction to Soils	4.0
*RENR 2140	Integrated Resource Project FWR	40.0
RENR 2190	Environmental Monitoring	3.0
RENR 2210	GIS	3.0

* a one-week course

Level 3		
COMM 3353	Advanced Technical Communication FWR	2.0
*RENR 2180	Summer Technical Report	
RENR 2245	Natural Resource Administration	3.0
RENR 3215	Recreational Land Management	7.0
RENR 3220	Wildlife Management	7.0
RENR 3225	Fish Management 1	6.0
RENR 3230	Projects	6.0

* prepared during summer

Level 4		
COMM 4453	Public Information Techniques for FWR	3.0
RENR 2240	Environmental Law Enforcement	3.0
*RENR 3175	Independent Studies	30.0
RENR 4215	Recreational Land Management 2	7.0
RENR 4220	Wildlife Management 2	7.0
RENR 4225	Fish Management 2	7.0
RENR 4230	Projects	5.0

* a two-week course

Course Descriptions

COMM 1145 (TCOM 116) Introduction to Technical Communication—This course introduces Forestry and Fish, Wildlife and Recreation students to professional writing skills as applied to routine request letters, persuasive requests, claim letters, adjustment letters, bad-news letters, and written instructions. It also includes resume writing and the basic skills of oral presentation.

COMM 2245 (TCOM 206) Technical Communication Forestry Resources—This course teaches Forestry students professional writing skills as applied to memo and formal reports: incident reports, progress reports, inspection reports, proposals, and comparison reports, including the use of graphics. It includes job-search skills, application letters, resumes and interviewing. It also includes oral presentations, library research and literature-citing skills. Prerequisite: COMM 1145.

COMM 2253 (TCOM 215) Technical Communication FWR—This course teaches Fish, Wildlife and Recreation students professional writing skills as applied in memo and formal reports: stream surveys, incident reports, progress reports, proposals, and comparison reports, including the use of graphics. It includes job-search skills: application letters, resumes and interviewing. It also includes oral presentation experience, library research and literature-citing skills. Prerequisite: COMM 1145.

COMM 3345 (TCOM 304) Advanced Technical Communication—In this course students review and practise the writing, thinking and revision skills that apply to the Summer Technical Report. This analytical report forms the major writing component of the course, but students also write several memos and give a major oral technical briefing. Prerequisite: COMM 1145 and 2245 or 2253.

COMM 3353 (TCOM 307) Advanced Technical Communication FWR—In this course students review and practise the writing, thinking and revision skills that apply to the Summer Technical Report and other industry-related documents. In addition, students prepare and present extended slide/tape presentations. Prerequisite: COMM 1145 and 2245 or 2253.

COMM 4445 (TCOM 402) Advanced Technical Communication—Students update their resumes and write application letters. In addition, they learn specialized techniques for communicating with the public through media plans, newspapers and video interviews. They practise their writing and revising skills in a Forestry Engineering Research Report. Prerequisite: COMM 1145, and 2245 or 2253 and 3345 or 3353.

COMM 4453 (TCOM 415) Public Information Techniques for Fish, Wildlife and Recreation—Students study specialized principles and techniques for communication with the public through interpretive, educational programs and the media. They write promotional data, news releases and journal articles. They practice public speaking, graphic display preparation, interview techniques and interpretive program design. Prerequisite: COMM 1145 and 2245 or 3345 or 3353.

FOOD 2240 (BISC 204) 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.

MATH 1451 (MATH 145) Basic Technical Mathematics for Renewable Resources—Measurement accuracy and precision, word problems, ratio, proportion and variation; mensuration including applications of geometry, trapezoidal and Simpson's rules; functions and graphs, linear programming, quadratic, logarithmic and exponential functions, graphs on logarithmic scales. Population models if time permits.

MATH 1452 (MATH 154) Basic Technical Mathematics for Fish, Wildlife and Recreation—Accuracy and precision in measurements, word problems of ratio, proportion and variation, mensuration including geometrical applications, trapezoidal and Simpson's rules, right and general triangle trigonometry, functions and graphs, linear programming, quadratic, logarithmic and exponential functions, graphs on logarithmic scales, introduction to population models.

MATH 2451 (MATH 245) Statistics for Forestry—Organization and presentation of data and frequency distributions; measures of central tendency, variation and skewness; probability laws and distributions with applications; estimation and theory tests from simple, paired and stratified samples; sample size and methods; regression and correlation of linear and non-linear relations.

MATH 2452 (MATH 254) Statistics for Fish, Wildlife and Recreation—Descriptive methods for data and frequency distributions, averages, measures of variability, skewness and kurtosis, probability laws, discrete and continuous probability distributions, sampling, estimation and hypothesis testing, comparison of two and more samples, introduction to analysis of variance; linear regression, correlation, and non-linear regression. Introduction to non-parametric methods if time permits.

RENR 1105 (RENR 101) Natural Resource Measurement—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, and sampling for population estimates. Emphasis is on field labs with supporting lectures.

RENR 1110 (RENR 106) Microcomputer Applications—An introduction to the use of computers for wordprocessing, graphs, and spreadsheet functions.

RENR 1115 (RENR 108) Applied Ecology in B.C. 1—Provides basic background material on B.C.'s land and climatic 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 are discussed. 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 emphasized.

RENR 1120 (RENR 104) Introduction to Aerial Photos and Mapping—Practical use and application of aerial photography and maps for natural resources. Classification, navigation, 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 Kail plotters. Drafting and map reproduction techniques. Continues in RENR 2120.

RENR 1125 (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 plant reproduction with particular emphasis on conifers. Recognition and evaluation of common plants in forest, rangeland and alpine habitats of B.C. and their uses in land management practices. A plant collection containing at least 75 native plant species is required from students.

***RENR 1200 (RENR 106) Microcomputer Applications FWR**—Introduction to computer applications for various forestry, fish, wildlife and recreation requirements. The course enables the first-time computer user to become familiar with specific microcomputer hardware, an operating system, and application software. Technology-related applications will be used to help students become acquainted with word processing, spreadsheets, graphics, databases, and the integrated nature of a software package.

RENR 2105 (RENR 201) Forest Measurement 1—Continuation of RENR 1105. Methods of measuring standing and felled timber. Direct measurement of tree diameter, height and age. 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: RENR 1105, 1120, MATH 1451; or instructor's approval.

RENR 2115 (RENR 203) Applied Ecology in B.C. 2— 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 wildlife habitats, and recreational planning are discussed. Examples are drawn from current environmental issues. Prerequisite: RENR 1105, 1125, and 1115; or instructor's approval.

RENR 2120 (RENR 204) Photo Interpretation and Mapping 2—A continuation of RENR 1120, with an emphasis on interpreting surficial materials and vegetation identification. Prerequisite: RENR 1120, and MATH 1451 or 1452; or instructor's approval.

RENR 2130 (RENR 202) Introduction to Soils—Introduces soil forming processes and physical properties of soils, soil survey and sampling methods, major soil classification systems.

RENR 2135 (RENR 205) 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.

RENR 2140 (RENR 208) Integrated Resource Project—This course is an intensive one-week project in which students from the Forestry and Fish, Wildlife, Recreation programs 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

team prepares a plan, presents it with visual aids, and engages in a public involvement process. An industry/agency group provides the final review.

RENR 2155 (RENR 326) Forest Management—Forest tenure and policy in B.C., calculation of coastal and interior concepts of resource use, planning guidelines, understanding the compilation of a five-year development plan, application of a Cutting Permit Application, understanding discounted cash flows in forest management, application of G.I.S. to forest management.

RENR 2170 (RENR 158) Log Scaling—A metric log scaling course with instruction occurring primarily on log booms in the Fraser River. Theory is reinforced through classroom sessions. The course includes species recognition, volume calculation, deduction for defect and log grading. Visits to conversion facilities to observe lumber recovery, shake and shingle production and veneer manufacturing from logs will be included. Prerequisite: RENR 3105 or instructor's approval.

RENR 2190 (RENR 210) Environmental Monitoring—Understanding of the basic processes of a variety of industrial activities and their impact on the environment, familiarity with various aspects of water and air pollution, siltation control, bioassay techniques, environmental chemistry testing and sampling protocol.

RENR 2210 (RENR 209) GIS—Introduces students to basic functions of a GIS and develops entry level expertise with CAD functions, database search, and information display.

RENR 2235 (RENR 311) Technical Project and Report—A detailed report on a phase of resource management.

RENR 2240 (RENR 312) Environmental Law Enforcement—Deals with the many aspects of 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."

RENR 2245 (RENR 416) Natural Resource Administration—Many of the functions once performed by government agencies and industry in the natural resources 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 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.

RENR 3105 (RENR 301) Resource Sampling and Valuation— An elaboration of the principles, concepts and techniques from RENR 2105 and the application and practice of these procedures. Introduces more advanced sampling analysis and procedures such as v. bar theory, count/enhanced count plots, 3-p sampling, current waste assessment techniques and quality cruising for appraisal purposes. Introduces alternate remote and electronic data sources, their applications and limitations. Prerequisite: RENR 2105, 2120, MATH 2452; or instructor's approval.

RENR 3135 (RENR 315) Fire Management 2—See RENR 2135. Prerequisite: RENR 2135 or instructor's approval.

RENR 3145 (RENR 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, site preparation, planning and methods. Prerequisite: RENR 1105, 1125, 1115, 2105, 2130, 2115; COMM 1102, 2345; or instructor's approval.

RENR 3150 (RENR 304) Forest Pestology—An integrated study of forest insect and disease problems. Basic life histories. The interaction of damage agencies in the forest. Damage prevention and control. Measuring and reporting of insect and disease damage. Recognition of currently important insects and diseases. Prerequisite: 1st year Forestry or instructor's approval.

RENR 3155 (RENR 426) Forest Administration—See RENR 2245.

RENR 3160 (RENR 318) Forest Engineering 1—During outdoor labs, students work in groups and prepare an operational harvesting plan utilizing cable harvesting systems. Course introduces cable harvesting systems, deflection lines, route reconnaissance, field surveys and forest road design. Prerequisite: Completion of first year forestry or instructor approval.

RENR 3165 (RENR 421) GIS—This course is designed to expose the student to the GIS technology now used by industry and Government agencies. The course will enable the student to create digital maps of forest lands and use associated data for the analysis of forestry issues. At the completion of the course the student will have the ability to utilize many of the CAD functions of a GIS, be aware of the current state of GIS technology, and will have an appreciation of how to utilize GIS techniques. Prerequisite: RENR 1120, 1200, 2120.

RENR 3175 (RENR 413) Independent Studies—Offers an opportunity to student groups or individuals to be involved in a project 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 level 4, after final exams have been written.

RENR 3215 (RENR 307) Recreational Land Management—An introductory course in recreational land management. Development and recreational use of areas designated as 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 development. 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. Prerequisite: first year of the program or instructor's approval.

RENR 3220 (RENR 308) Wildlife Management—The principles and practice of wildlife management, with particular reference to problems and procedures in B.C. 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. Field study to support and extend lecture and lab material. Prerequisite: first year of the program or instructor's approval.

RENR 3225 (RENR 309) Fish Management 1—The biology of B. C. fish including anatomy, taxonomy, physiology, behavior and ecology. Management 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 will be done in the field. Emphasis throughout is on the B.C. situation. Prerequisite: 1st year of the program or instructor's approval.

RENR 3230 (RENR 310) Projects—The student selects a topic of interest and prepares a field-oriented study plan. A major

library research paper is prepared using the Council of Biological Editors' (CBE) style format. This work is continued in RENR 4230. Prerequisite: first year of the program or instructor's approval.

RENR 4145 (RENR 405) Silviculture 2—Site examination, analysis and prescriptions; 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: RENR 3145 or instructor's approval.

RENR 4150 (RENR 404) Forest Pestology—See RENR 3150. Forest health issues. The ecology of pests, insect and disease sampling and analysis techniques, forest pest decision-making techniques, pest survey techniques leading to PHSP and stand treatment recommendations. Prerequisite: RENR 3150 or instructor's approval.

RENR 4160 (RENR 417) Forest Engineering 2—Introduction to ground-based harvesting systems, bridges and drainage structures, sorting and transportation of logs, engineering economics, harvest planning and forest landscaping. Students use current microcomputer software including databases and spreadsheets to solve various engineering problems. Prerequisite: RENR 1110, 3160.

RENR 4215 (RENR 407) Recreational Land Management 2—See RENR 3215. Prerequisite: RENR 3215 or instructor's approval.

RENR 4220 (RENR 408) Wildlife Management 2—See RENR 3220. Prerequisite: RENR 3220 or instructor's approval.

RENR 4225 (RENR 409) Fish Management 2—See RENR 3225. Prerequisite: RENR 3225 or instructor's approval.

RENR 4230 (RENR 410) Projects—This is a continuation of the work begun in RENR 3230. The student conducts a professional field research study and prepares a final report of a quality suitable for publication. Prerequisite: RENR 3230 or instructor's approval.

Faculty and Staff

J. T. Neilson, Associate Dean
M. A. Angelo, B.S.F., M.F. Co-ordinator
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Advisory Committee Members:

Fish, Wildlife Recreation Option

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D. Carmichael, Ministry of Crown Lands and Parks
G. Carlson, Ministry of Environment
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C. Scrivener, Department of Fisheries & Oceans
G. Taylor, Ministry of Environment
M. Turner, Ministry of Crown Lands and Parks

Advisory Committee Members: Forestry Option

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J. Chettick
R. Clark, Fletcher Challenge Canada
M. DeHaan, Regional Manager, Ministry of Environment
S. Dixon, Independent Consultant
D. Fletcher
D. Gilbert, Ministry of Forestry
S. Huddart, Basic Forestry
D. Jepsen, R.P.F.
K. Joy, Parks Forester, Ministry of Parks
L. Kaivanto, Ministry of Education
L. Kiss, Valuation Officer, Fletcher Challenge Canada Ltd.
D. Lockwood
H. Lynum, Independent Consultant
S. Lowrey, Air Co-ordination, B.C Forest Service
B. Manfield, Sylva Management Services
M. Mosher, RPF., P. Eng., Forestland Industries Ltd.
J. Nelson, University of B.C., Faculty of Forestry
A. Orr-Ewing, Fletcher Challenge Canada Ltd.
E. (Ted) Richardson, Aprotek Design Ltd.
C. Perry, International Woodworkers Association
A. Simon, Ministry of Forests
M. Stewart, RPF, Stewart Ewing Associates Ltd.
B. Vink, MacMillan Bloedel Ltd.
D. Winston, Director, Forestry Canada Pacific & Yukon Region
C. Wood, Ministry of Forests
P. Wooding, Administrator Forester

SURVEYING AND MAPPING

Diploma Program
Technician Program

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 opportunities for Surveying and Mapping graduates. Employment may be found throughout Canada and around the world.

The Program

BCIT offers both a two-year and a specialized one-year program. In conjunction with Part-time Studies, the Surveying 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 and earth sciences, and should enjoy a vigorous outdoor lifestyle.

Students desiring a less academic program may take advantage of the more field-oriented technician level program. Students who select this program will normally complete Level 1 of the General Surveying 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-level course of studies specializing in production photogrammetry. Employment in surveying during the summer break is considered desirable.

Courses in Geographic Information Systems are offered under the Part-time Studies program (see Part-time Studies Calendar), and as a post-diploma program in the School of Engineering Technology.

Program Length

Two years full-time for the Diploma program beginning in September each year.
One year full-time for the Technician program beginning in September each year.

Total Fees (subject to change—does not include book or supply costs)

$3,965.30 for the two-year Diploma program (1993/94).
$1,991.15 for the one-year Technician program (1993/94).

Accreditation

This program is accredited by the Applied Science Technologists and Technicians of B.C.

Degree Transfer/Completion

Following completion of the two-year diploma program, graduates are granted course credits at the University of Calgary in the Geomatics Engineering Department, at the University of New Brunswick and at the Oregon Institute of Technology, and towards examinations set by the Western Canadian Board of Examiners leading to registration as a Professional Land Surveyor.

Prerequisites

High school graduation with English 12, Math 12 and Physics 11 are entrance requirements for this program. Preference will be given to students achieving a 'C' grade or better in the prerequisites. Photogrammetry students must have good stereo vision.

Program: SURVEYING AND MAPPING

Level 1		Clrm Hrs/wk	Crdt
COMM 1135	Introduction to Technical Communication	3.0	3.0
MATH 1511	Basic Technical Mathematics for Survey	7.0	7.0
PHYS 1151	Physics for Surveying 1	5.0	5.0
SURV 1161	Surveying Computations 1	3.0	4.0
SURV 1162	Surveying Instrumentation 1	1.0	1.0
SURV 1164	Field Survey 1	8.0	8.0
SURV 1165	Drafting and Cartography	2.0	2.0
SURV 1172	Computer Applications 1	2.0	2.0

Level 2A		Clrm Hrs/wk	Crdt
COMM 2251	Technical Communication—Surveying	3.0	4.0
MATH 2511	Calculus for Survey	7.0	9.5
PHYS 2151	Physics for Surveying 2	3.0	4.0
SURV 2261	Plane Surveying Computations 2	3.0	4.0
SURV 2262	Surveying Instrumentation 2	1.0	1.5
SURV 2264	Field Survey 2	8.0	10.5
SURV 2265	Surveying CAD 1	2.0	2.5
SURV 2267	Photogrammetry 1	3.0	2.0
SURV 2272	Computer Applications 2	2.0	2.5

Level 2B			
COMM 2251	Technical Communication—Surveying	3.0	
MATH 2511	Calculus for Survey	7.0	9.5
PHYS 2151	Physics for Surveying 2	3.0	4.0
SURV 2261	Surveying Computations 2	3.0	4.0
SURV 2262	Surveying Instrumentation 2	1.0	1.5
SURV 2263	Earth Sciences	3.0	2.0
SURV 2264	Field Survey 2	8.0	10.5
SURV 2265	Surveying CAD 1	2.0	2.5
SURV 2272	Computer Applications 2	2.0	2.5

Option: SURVEYING

Level 3			
MATH 3511	Matrix Methods for Survey	4.0	4.0
SURV 3361	Surveying Computations 3	3.0	3.0
SURV 3362	Geodetic Surveying 1	3.0	3.0
SURV 3363	Mathematical Cartography	3.0	3.0
SURV 3364	Field Survey 3	6.0	5.0
SURV 3365	Surveying CAD 2	3.0	2.0
SURV 3367	Photogrammetry 2	2.0	2.0
SURV 3369	Hydrographic Surveying	2.0	2.0
SURV 3372	Computer Applications 3	2.0	2.0
SURV 3378	Mining Surveying	2.0	2.0

Level 4A		Clrm Hrs/wk	Crdt
MATH 4511	Statistics for Survey	5.0	4.5
SURV 4461	Surveying Computations 4	3.0	4.0
SURV 4462	Geodetic Surveying 2	4.0	4.0
SURV 4463	Adjustment of Surveying Measurements 1	3.0	2.0
SURV 4465	Surveying CAD 3	3.0	4.0
SURV 4467	Photogrammetry 3	3.0	4.0
SURV 4468	Cadastral Surveying	3.0	2.0
SURV 4469	Planning and Land Utilization	3.0	2.0
SURV 4472	Engineering Surveying	2.0	1.5

Level 4B			
SURV 4461	Surveying Computations 4	2.0	4.0
SURV 4464	Field Surveying 4	14.0	10.0
SURV 4465	Surveying CAD 3	3.0	4.0
SURV 4467	Photogrammetry 3	3.0	4.0
SURV 4480	Land Information Systems	3.0	2.0
SURV 4562	Astronomy	3.0	2.0
SURV 4563	Adjustment of Surveying Measurements 2	3.0	2.0

Option: PHOTOGRAMMETRY

Level 3			
MATH 3511	Matrix Methods for Survey	4.0	4.0
SURV 3361	Surveying Computations 3	3.0	3.0
SURV 3362	Geodetic Surveying 1	3.0	3.0
SURV 3363	Mathematical Cartography	3.0	3.0
SURV 3365	Surveying CAD 2	3.0	2.0
SURV 3367	Photogrammetry 2	2.0	2.0
SURV 3369	Hydrographic Surveying	2.0	2.0
SURV 3372	Computer Applications 3	2.0	2.0
SURV 3377	Photogrammetry Lab 1	6.0	10.0
SURV 3378	Mining Surveying	2.0	2.0

Level 4A			
MATH 4511	Statistics for Survey	5.0	4.5
SURV 4461	Surveying Computations 4	3.0	4.0
SURV 4462	Geodetic Surveying 2	4.0	4.0
SURV 4463	Adjustment of Surveying Measurements 1	3.0	2.0
SURV 4465	Surveying CAD 3	3.0	4.0
SURV 4467	Photogrammetry 3	3.0	4.0
SURV 4468	Cadastral Surveying	3.0	2.0
SURV 4469	Planning and Land Utilization	3.0	2.0
SURV 4472	Engineering Surveying	2.0	1.5

Level 4B			
SURV 4461	Surveying Computations 4	2.0	4.0
SURV 4465	Surveying CAD 3	3.0	4.0
SURV 4467	Photogrammetry 3	3.0	4.0
SURV 4477	Photogrammetry Lab 2	14.0	10.0
SURV 4480	Land Information Systems	3.0	2.0
SURV 4562	Astronomy	3.0	2.0
SURV 4563	Adjustment of Surveying Measurements 2	3.0	2.0

Program: TECHNICIAN

Level 1			
COMM 1135	Introduction to Technical Communication	3.0	3.0
MATH 1511	Basic Technical Mathematics for Survey	7.0	7.0
PHYS 1151	Physics for Surveying	5.0	5.0
SURV 1161	Surveying Computations 1	3.0	4.0
SURV 1162	Surveying Instrumentation 1	1.0	1.0
SURV 1164	Field Surveying 1	8.0	8.0
SURV 1165	Drafting and Cartography 1	2.0	2.0
SURV 1172	Computer Applications 1	2.0	2.0

Level 2			
COMM 2251	Technical Communication—	3.0	4.0
SURV 2260	Computational Methods for the Field Technician	5.0	6.5
SURV 2265	Surveying CAD 1	1.0	2.5
SURV 2267	Photogrammetry 1	3.0	2.0
SURV 2268	Field Surveying Techniques	13.0	18.5
SURV 2272	Computer Applications 2	2.0	2.5

Course Descriptions

COMM 1135 (TCOM 101) Introduction to 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.

COMM 2251 (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; occurrence, trip, progress, evaluation and recommendation reports. Prerequisite: COMM 1135.

MATH 1511 (MATH 151) Basic Technical Mathematics for Survey—Algebra review with applications to Survey. Systems of linear equations. Trigonometric functions of any angle, solution of triangles, identities and trigonometric equations. Spherical trigonometry. Analytical geometry.

MATH 2511 (MATH 251) Calculus for Survey—Limits, the derivative, differentiation rules for algebraic, trigonometric, inverse trigonometric, logarithmic and exponential functions; curve sketching, related rates, differentials and radius of curvature. Selected integration, Simpson's rule and length of arc. The clothoid. Taylor and Maclaurin series. 3-D analytic geometry, partial differentiation.

MATH 3511 (MATH 351) Matrix Methods for Survey—Matrix theory and its application in surveying focusing on the elements of matrix operations used in least squares adjustments. Includes vectors and coordinate transformations, matrix calculus, eigenvalues and eigenvectors, quadratic forms and ellipses.

MATH 4511 (MATH 451) Statistics for Survey—A comprehensive course on the application of statistics and probability to surveying problems. Topics range from elementary data organization to propagation of measurement error and the relationship between error ellipses and bivariate normally distributed data.

PHYS 1151 (PHYS 123) Physics for Surveying 1—General topics 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.

PHYS 2151 (PHYS 223) Physics for Surveying 2—See PHYS 1151. Prerequisite: PHYS 1151.

SURV 1161 (SURV 161) Surveying 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; inversing; computations of traverses; traverse adjustment by compass rules; locations of gross linear and gross angular errors; area computations by coordinate and DMD methods; UTM traverse computations; missing parts.

SURV 1162 (SURV 165) Surveying Instrumentation 1—An introduction to surveying equipment, its design, function, operation, testing and adjustment, care and handling.

SURV 1164 (SURV 164) Field Survey 1—Introduction to the principles of surveying; purposes and types of surveys; methods and field techniques in distance measurements; linear errors and corrections; datum; the principle of differential levelling; benchmark and detail levelling; test and adjustment of the level; introduction of the transit (theodolite); angle measurements; compass and theodolite traversing; note keeping.

SURV 1165 (SURV 185) Drafting and Cartography—Map drawing is one of the fundamental skills required by surveyors. To be able to draw plans and maps requires the development of several skills and an understanding of basic cartographic theory. This introductory course will allow the student to gain the necessary skills and knowledge by completing exercises in: the use of drafting scales; lettering; interpolating and drawing contour lines, plans, profiles and cross use of the polar planimeter; plotting data resulting from typical surveying projects by various methods; mapping within a rectangular or polar coordinate system.

SURV 1172 (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 includes: 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 2260 (SURV 260) Computational Methods for the Field Technician—Review of important geometry theorems and their application to survey. Computations of simple circular curves and symmetrical vertical curves. The solution of problems related to the subdivision of land. The reduction of field acquired measurements. Prerequisite: SURV 1161.

SURV 2261 (SURV 261) Surveying Computations 2—Missing parts: different techniques of computation problems on subdivision of land; prismoidal 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. Prerequisite: SURV 1161.

SURV 2262 (SURV 262) Surveying Instrumentation 2—A continuation of SURV 1162.

SURV 2263 (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 2264 (SURV 264) Field Survey 2—UTM traverse and computations; different field methods of angle measurements; trigonometric levelling; stadia surveys; topographic surveys by various methods and instruments; road location; slope staking; cuts and fills; setting out circular curves; building site layout; distance measurements by EDM's. Prerequisite: SURV 1164.

SURV 2265 (SURV 265) Surveying CAD 1—Enables students to apply computer-aided drafting fundamentals to the solution of surveying problems. Students will acquire basic skills in computer disk operating systems (DOS) and computer-aided drafting software such as AutoCAD and Rapid Transit. Prerequisite: SURV 1165.

SURV 2267 (PHOT 267) Photogrammetry 1—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.

SURV 2268 (SURV 268) Field Surveying 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 EDM's. Prerequisite: SURV 1164.

SURV 2272 (SURV 272) Computer Applications 2—A continuation of SURV 1172. 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. Prerequisite: SURV 1172.

SURV 3361 (SURV 361) Surveying 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. Prerequisite: SURV 2261.

SURV 3362 (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. Gravitation and centrifugal forces; gravity, measurement and reduction, gravity anomalies, separation of the geoid, deflection of the vertical; precise levelling, orthometric and dynamic heights. Prerequisite: MATH 2511.

SURV 3363 (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. Prerequisite: MATH 2511.

SURV 3364 (SURV 364) Field Survey 3—Operation of first and second order theodolites, EDM instruments, precise levels, gyrotheodolites; projects of precise and trigonometric levelling, EDM calibration, traversing and detailing by total station instrument, determination of azimuth by gyrotheodolite. Prerequisite: SURV 2264.

SURV 3365 (SURV 365) Surveying CAD 2—A continuation of SURV 2265. Topics include sequential files, string manipulation, microcomputer graphics. Programming in BASIC and FORTRAN for plotters and digitizers, data collector transfers, reduction of field data, the use of survey-specific CAD software. Prerequisite: SURV 2265.

SURV 3367 (PHOT 367) Photogrammetry 2—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. Prerequisite: SURV 2267.

SURV 3369 (SURV 369) Hydrographic Surveying—Topics include tides and water levels, obtaining, positioning and reducing soundings, an overview of electronic positioning, electromagnetic wave propagation and positioning systems; propagation of sound in water; acoustic positioning and devices used in hydrography; types and uses of nautical charts. Prerequisite: SURV 2261, 2264.

SURV 3372 (SURV 372) Computer Applications 3—Students will study the FORTRAN language and achieve 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 WATFIV compiler, fundamentals of the FORTRAN language, FORTRAN 77 compiler, CALCOMP calls, file handling and transfers, IBM PC, FORTRAN compilers. Prerequisite: SURV 2272.

SURV 3377 (PHOT 377) Photogrammetry Lab 1—The geometry and physical nature of the photograph. Optics for photogrammetry. Principles of photography. Darkroom procedures. Aerial cameras. Stereoscopy. The spatial model. Comparator measurements of photocoordinates. 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.

SURV 3378 (SURV 378) Mining Surveying—Covers the forms of surveying specifically applied to mining with particular emphasis on underground surveying. Topics include the establishment of control (X,Y,Z) in underground workings using piano wires, gyrotheodolites and plummets; control of direction and gradient of tunnels; area and volume surveys; exploration surveys of drill holes; Mining Act responsibility of the mine surveyor. Prerequisite: SURV 2261, 2264.

SURV 4461 (SURV 461) Surveying Computations 4—See SURV 3361. Prerequisite: SURV 3361.

SURV 4462 (SURV 462) Geodetic Surveying 2—Close satellite theory, Doppler positioning, the Global Positioning System. Prerequisite: SURV 3362.

SURV 4463 (SURV 363) Adjustment of Surveying Measurements 1—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 4464 (SURV 464) Field Surveying 4—Students execute the following survey projects: a control scheme of triangulation and trilateration; astronomical observations on the sun and stars for azimuth, latitude and longitude; an engineering survey project including municipal, construction and highway surveys; a hydrographic project of sounding and the production of a hydrographic chart; a mining survey. The latter two projects are conducted off campus in an industrial setting. Prerequisite: SURV 3364.

SURV 4465 (SURV 465) Survey CAD 3—Topics include data structures, algorithms for computer cartography. Preparation of Legal Surveying plans under the terms set out in the "Surveyor General's Instructions to Land Surveyors." Engineering drawings such as plans, profiles and earthwork diagrams. Base mapping for Geographical Information Systems (GIS).

SURV 4467 (PHOT 467) Photogrammetry 3—Review of geometric projections, inner, relative and absolute orientation. Three-dimensional similarity transformation, projective transformation, collinearity and coplanarity equations. Restitution instruments—analog and analytical types. Accuracy of photogrammetric measurement. Aerial triangulation. Photogrammetric products -topographic maps. Orthophoto maps and digital elevation models (DEM). Prerequisite: SURV 3367.

SURV 4468 (SURV 468) Cadastral Surveying—Introduction to the Canadian legal system, real property law, boundary concepts. Liability of surveyors. Land registration systems; the multipurpose cadastre. The Dominion Lands System and land systems used in British Columbia: history, detailed description, calculations. Operation of land titles systems in Western Canada. Descriptions of land. Laws and regulations governing surveys in Western Canada (including offshore surveys) as they apply to the systems of surveys.

SURV 4469 (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 affecting planning. Zoning and its implications for land use and land development. Land use studies, the subdivision of land and elementary economics related to land development. Prerequisite: SURV 3367.

SURV 4472 (SURV 472) Engineering Surveying—Enables students to recognize and solve the problems associated with the survey of large construction projects. Topics include: preliminary surveys for the design of public works, water, sewer, and roads. Surveying practices for specialized projects such as bridge construction, dam site monitoring and tunnelling. Prerequisite: SURV 2262, 3364.

SURV 4477 (PHOT 477) Photogrammetry Lab 2—Coordinate transformations. Colinearity and coplanarity equations. Accuracy of coordinate determination. Aerial triangulation—preparation, measuring and adjustment. Application of photogrammetry to survey and mapping projects. Introduction to digital mapping. Prerequisite: SURV 3377.

SURV 4480 (SURV 480) Land Information Systems—Design and operation of land related information systems and their role in digital mapping and spatial data management, including concepts of information and LRIS's, the multipurpose cadastre, spatial data management, georeferencing, land information modelling, geoprocessing, input/output operations, file storage, database management and distributed processing, techniques involved in project specifications, design and implementation, and the selection of computer hardware/software for the LRIS's. Review and evaluation of some major LRIS's.

SURV 4562 Astronomy—Practical astronomy. Review of spherical trigonometry, celestial sphere, systems of coordinates, time, celestial coordinates, star prediction and identification, solar and stellar observations for azimuth, latitude and longitude. Spherical and rectangular coordinate systems and transformations.

SURV 4563 Adjustment of Surveying Measurements 2—A continuation of SURV 4463.

Faculty and Staff

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Surveying and Mapping Technology Advisory Committee

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WOOD PRODUCTS MANUFACTURING

Diploma Program

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 great 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 supervisory, technical, marketing and sales positions. 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, computer skills, and lumber tallying and grading. In the second year there is increased emphasis on manufacturing techniques, process control, mechanical and electrical equipment and economics. Second-year courses also emphasize management skills in areas such as problem-solving, supervision, cost control, product sales and distribution, and business communications. Classroom instruction is heavily augmented by field trips to coastal and interior operations.

Program Length

Two years full-time beginning in September each year.

Total Fees (subject to change—does not include book or supply costs)

$3,965.30 for the two-year program (1993/94).

Prerequisites

High school graduation with English 12, Math 12 and one Science 11: Biology, Chemistry or Physics (Physics preferred), 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.

Program: WOOD PRODUCTS MANUFACTURING

		Clrm Hrs/wk	Credit
Level 1			
COMM 1135	Introduction to Technical Communication	3.0	3.0
COMP 1130	Computer Applications/ Wood Products	3.0	3.0
MATH 1461	Basic Technical Mathematics for Wood Products Manufacturing	5.0	5.0
PHYS 1146	Physics for Wood Products 1	5.0	5.0
WOOD 1101	Wood Science 1	4.0	4.0
WOOD 1102	Lumber Grading 1	2.0	2.0
WOOD 1103	Lumber Tallying*	2.0	2.0
WOOD 1104	Log Utilization	6.0	6.0
Level 2			
COMM 2246	Technical Communication (Wood Products)	3.0	4.5
COMP 2140	Linear Programming	3.0	4.0
CHSC 1208	Engineering Materials	3.0	4.0
MATH 2461	Statistics and Control for Quality Wood Products Manufacturing	5.0	2.5
MECH 1900	Interpretation of Technical Drawing	2.0	3.0
PHYS 2146	Physics for Wood Products 2	5.0	6.5
WOOD 1201	Wood Science 2	2.0	2.5
WOOD 1202	Lumber Grading 2*	8.0	10.5
Level 3			
COMM 3346	Advanced Technical Communication (Wood Products)	2.0	2.0
ELEX 2845	Electrical Equipment	4.0	4.0
MSYS 3860	Mechanical Equipment (Wood Products)	3.0	3.0
OPMT 1164	Management Engineering 1 for Wood Products	3.0	3.0
WOOD 1203	Summer Technical Report	1.0	1.0
WOOD 1301	Wood Science 3	3.0	3.0
WOOD 2105	Lumber Manufacture 1	8.0	8.0
WOOD 2106	Plywood Manufacture	4.0	4.0
WOOD 2107	Mill Management 1	3.0	3.0

Level 4		Clrm Hrs/wk	Credit
COMM 4446	Advanced Technical Communication (Wood Products)	2.0	2.5
MKTG 1420	Wood Products Sales and Distribution	4.0	5.5
OPMT 2264	Management Engineering 2 for Wood Products	4.0	5.5
WOOD 1401	Wood Science 4	2.0	2.5
WOOD 2207	Mill Management 2	10.0	13.5
WOOD 3105	Lumber Manufacture 2	5.0	6.5
WOOD 3106	Plywood/ Panelboard Manufacture	3.0	4.0

*The attainment of a recognized industrial certificate with a minimum mark of 70% is required as a condition of graduation.

Course Descriptions

CHSC 1208 (CHSC 208) Engineering Materials Wood—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 nondestructive testing.

COMM 1135 (TCOM 101) Introduction to Technical Communication—This course covers basic writing and speaking skills needed for communicating technical information in the wood products industry. Students learn to write routine letters and memos, and to plan and present an oral report. They also write a resume and job application letter and prepare for job interviews.

COMM 2246 (TCOM 207) Technical Communication for Wood Products Manufacturing—This course prepares students to write reports for the wood products industry. They learn to write technical descriptions and instructions, prepare effective graphics, and write several reports. They also learn how to do primary and secondary research and to use a word processing package. Prerequisite: COMM 1135.

COMM 3346 (TCOM 305) Advanced Technical Communication for Wood Products Manufacturing -Students review and practice technical reporting. They write several memos and a Summer Technical Report which is evaluated jointly by the instructor and by people employed in the lumber and plywood industry. They practice illustrating, revising and editing skills, and present an oral technical report. Prerequisite: COMM 1135, 2246.

COMM 4446 (TCOM 403) Advanced Technical Communication for Wood Products Manufacturing -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: COMM 1135, 2246, 3346.

COMP 1130 (COMP 121) Computer Applications/Wood Products—Computer applications in engineering technologies; how a computer works, recognizing problems suitable for computer solution, IBM DOS, and communicating with computer personnel. Use of popular spreadsheet software for modelling and problem-solving. Emphasis is on the use of computers to solve problems related to the technology.

COMP 2140 (COMP 283) Linear Programming—Use of computer to solve business problems using linear programming techniques. Topics include the graphical method; algebraic method; simplex method; analysis of simplex results; LKP problem formulation; analysis of computer solutions; use of reduced costs and shadow prices; sensitivity analysis; practical applications and limitations of LP; implementation of results. The course will also cover the use of popular database software for record keeping, data query and analysis, and reporting. Sawmill modelling using commercial software will be also explored. Prerequisite: COMP 1130.

ELEX 2845 (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; Programable Logic Controllers and industrial applications of PLC's.

MATH 1461 (MATH 146) Basic Technical Mathematics for Wood Products Manufacturing -Numerical computations. Linear and quadratic equations. Systems of linear equations. Geometry of plane and solid figures. 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 2461 (MATH 246) Statistics and Quality Control for Wood Products Manufacturing -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 1900 (MECH 146) Interpretation of Tech Drawing—An introductory course for persons with little or no experience in engineering graphics. Students learn to produce by sketching basic orthographic and pictorial drawings. A strong emphasis will be placed on the understanding of engineering graphics rather than developing drawing skills. The latter part of the course will deal with blueprint reading in areas of wood products manufacturing.

MKTG 1420 (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 entire sales process, from telephone solicitation to complete documentation of FOB and CIF orders, is covered in detail.

MSYS 3860 (MECH 416) Mechanical Equipment—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.

OPMT 1164 (OPMT 164) Management Engineering 1: Wood Products Manufacturing—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 2264 (OPMT 264) Management Engineering 2: Wood Products Manufacturing—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 a job in an industrial plant in the forest products industry for study. 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. Prerequisite: OPMT 164.

PHYS 1146 (PHYS 118) Physics for Wood Products 1—This course studies basic physical principles necessary for applications in the wood products industry. The course is primarily mechanics but also includes sections on properties of matter and fluids. Mechanics include kinematics, dynamics, vectors, statics, friction, energy, momentum, simple machines, circular motion, rotational kinematics and dynamic power transmission. Properties of matter include elasticity and ultimate strength of materials. Fluids include pressure, buoyancy, viscosity and fluid dynamics. The accompanying lab program emphasizes measurement techniques, data analysis and concise report writing.

PHYS 2146 (PHYS 218) Physics for Wood Products 2—This is the second term of the applied physics program which covers thermal physics, electricity and magnetism, and wave motion. Thermal physics include specific and latent heat, thermal expansion, heat transfer, thermodynamics. Electricity and magnetism include electrostatic capacitors, DC and AC circuits, electrical safety, transformers, generators, motors. Wave motion includes mechanical and electromagnetic waves, standing waves, resonance, sound, lasers, x-rays. A lab program accompanies this program. Prerequisite: PHYS 1146.

WOOD 1101 (WOOD 101) Wood Science 1—An introduction to the manufacture of forest products. Topics include elementary botany, dendrology, identification of British Columbia commercial tree species, and macro and micro wood technology.

WOOD 1102 (WOOD 102) Lumber Grading 1—Given in Level 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.

WOOD 1103 (WOOD 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 a 70% pass mark. 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.

WOOD 1104 (WOOD 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 sawmill and plywood industries. Considerable time is spent practising scaling techniques on selected log booms.

WOOD 1201 (WOOD 201) Wood Science 2—This course prepares students in wood processing and handling for lumber manufacturing and pulp chip preparation. Topics include debarking; chipping; chip screening, conveyance, storage; wood and chip units and conversion factors. Problem-solving in these topics will give students a good working knowledge of this aspect of the wood industries operation.

WOOD 1202 (WOOD 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.

WOOD 1203 (WOOD 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.

WOOD 1301 Wood Science 3—Structure and properties of wood. Topics include wood micro and ultra structure; moisture in wood; specific gravity and relative density; rheological behavior of wood. Lab sessions will complement these topics as well as shrinkage, swelling and dimensional stability of wood.

WOOD 1401 Wood Science 4—Structure and properties of wood. Topics include the mechanical properties of wood; wood protection and preservation, and end uses. Emphasis will be placed on laboratory project report writing and treatment of experimental results.

WOOD 2105 (WOOD 105) Lumber Manufacture 1—Methods and equipment used in the manufacture of lumber in the B.C. Coast and Interior are examined including log preparation, primary and secondary breakdown, and sawmill remanufacture. Saw dynamics and maintenance are also examined. Field trips augment lecture material.

WOOD 2106 (WOOD 106) Plywood Manufacture—Methods and equipment used in the manufacture of plywood in the B.C. Coast and Interior are examined. Processes discussed include wood veneer production (including rotary peeling, clipping, and sorting), veneer drying and panel construction systems. Some time is spent discussing other types of panel boards and related coatings and overlays. Field trips augment lecture material.

WOOD 2107 (WOOD 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.

WOOD 2207 (WOOD 207) Mill Management 2—A continuation of WOOD 2107.

WOOD 3105 (WOOD 205) Lumber Manufacture 2—Methods and equipment used in the kiln drying and planing of lumber are examined as well as quality control, fibre usage, manufacturing economics, specialty remanufacture and machine stress grading. A charge of lumber will be dried at the BCIT dry kiln and the results examined.

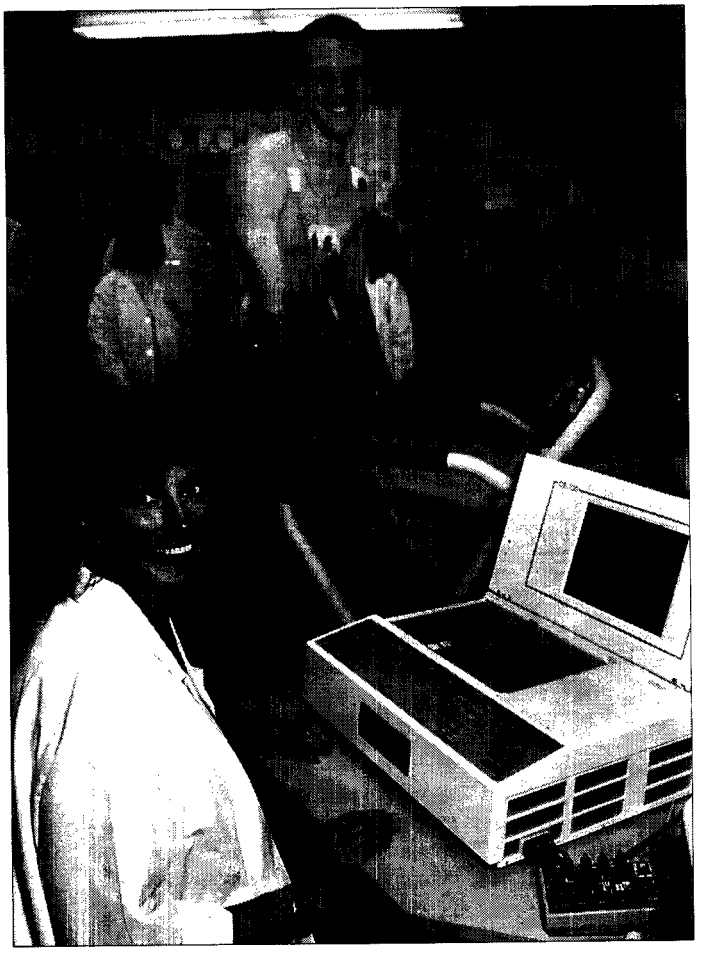
WOOD 3106 (WOOD 206) Plywood/Panelboard Manufacture—A continuation of WOOD 2106. Methods and equipment used in the manufacture of plywood in the B.C. Coast and Interior are examined. Processes discussed include lay-up, pressing and finishing. Methods and equipment used in other types of panelboard manufacture will also be discussed. Field trips augment material given in lectures.
*The attainment of a recognized industrial certificate with a minimum mark of 70% is required as a condition of graduation.

Faculty and Staff

J.T. Neilson, B.A.Sc., P.Eng., Associate Dean
E.G. Worthy, Dipl.T., A.Sc.T., Program Head
D.G. Mickey, B.Sc., A.Sc.T.

Advisory Committee Members

W. Beatty, Council of Forest Industries, Chair
A. Coombs, Weldwood of Canada Ltd.
R. Fraser, Lignum Limited
L. Haines, Fletcher Challenge Canada Ltd.
J.E. Hards, Carroll-Hatch International
I. Harvey, B.C. Wood Specialties Group
F. Ibis, Northwood Pulp & Timber Ltd.
J. Kennedy, Crestbrook Forest Industries Ltd.
P. Legg, IWA—Canada
D. Martin, MacMillan Bloedel Limited
B. Strongitharm, Primex Forest Products Ltd.
C. Luke, Western Wood Produc Forest Products









SCHOOL OF HEALTH SCIENCES

154/ ADMINISTRATION

154/ BASIC HEALTH SCIENCES

154/ BIOMEDICAL ENGINEERING TECHNOLOGY

157/ CARDIOLOGY/
CARDIOVASCULAR TECHNOLOGY

159/ CYTOGENETICS LABORATORY TECHNOLOGY

161/ DIAGNOSTIC MEDICAL SONOGRAPHY

162/ ELECTRONEUROPHYSIOLOGY TECHNOLOGY

164/ ENVIRONMENTAL HEALTH: PUBLIC
HEALTH INSPECTOR TRAINING PROGRAM

167/ MEDICAL LABORATORY TECHNOLOGY

169/ MEDICAL RADIOGRAPHY TECHNOLOGY

171/ NUCLEAR MEDICINE TECHNOLOGY

174/ NURSING

178/ OCCUPATIONAL HEALTH AND SAFETY

180 PROSTHETICS AND ORTHOTICS TECHNOLOGY

SCHOOL OF HEALTH SCIENCES

ADMINISTRATION

Office Of The Dean
George Eisler, M.A.Sc., P.Eng., M.B.A., Dean
Andrea Labé, Administrative Assistant
Patti Mark, B.A., Administrative Officer
Environmental Health
(Public Health Inspector Training)
Occupational Health and Safety

Diagnostic Technologies
Verna Magee Shepherd, M.Sc., CHE, Associate Dean
Maryanna Nowak, Secretary
Jennifer Lee, Program Assistant
Janette Pfaff, Program Assistant
Basic Health Sciences
Cardiology/Cardiovascular Technology
Cytogenetics Laboratory Technology
Diagnostic Medical Sonography
Electroneurophysiology
Medical Laboratory Technology
Medical Radiography Technology
Nuclear Medicine Technology

Nursing and Health Engineering
M. Bernadet Ratsoy, B. Sc. N., M. Sc., R. N., Associate Dean
Nancy Sayre, Secretary
Loreen Crawford, Program Assistant
Ingrid Friesen, Program Assistant
Kathy Whitham, Program Assistant
Biomedical Engineering Technology
Nursing
Prosthetics and Orthotics
Advanced Nursing

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 School of Health Sciences Programs. 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 future challenges of the modern health worker.

Faculty and Staff

Verna Magee Shepherd, M.Sc., CHE, Associate Dean
D.W. Martin, B.Sc. (Hons.), M.S.R., Program 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

BIOMEDICAL ENGINEERING TECHNOLOGY

Diploma Program

Program Objective

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 physiological 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 Engineering Technology Program may be employed in hospitals, clinics, research labs and medical equipment sales and service organizations.

Biomedical Engineering Technologists may be responsible for scheduled and corrective maintenance and safety inspection of electro-medical equipment, and participate in research and development, purchase specification, equipment evaluation, operator training and management of risks involving the use of biomedical equipment.

The Program

Graduates from the Biomedical Engineering Technology Program receive a Diploma of Technology in Biomedical Engineering Technology. The Biomedical Engineering Technology Program provides education and training in the following subject areas: technical communication; algebra; calculus; statistics; basic chemistry, organic chemistry, biochemistry and analytical chemistry; human anatomy and physiology; biophysics; electricity and electronics; biomedical devices; 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 five weeks in supervised clinical training in a local hospital, research agency or equipment supply firm.

Throughout the program, hands-on laboratory experience is provided and students are trained in engineering problem-solving methodology to allow them to upgrade and maintain their knowledge.

Memberships in the Canadian Medical and Biological Engineering Society (CMBES) and the Applied Science Technologists and Technicians of British Columbia (ASTTBC) are recommended.

Program Length
Two years full-time beginning in September each year.

Total Fees (subject to change—does not include book or supply costs)
$3,965.30 for the two-year program (1993/94).

Accreditation
The Biomedical Engineering Technology program is accredited by ASTTBC. Graduates are eligible for registration as Applied Science Technologists (ASc.T.) after two years of relevant work experience following graduation.

Prerequisites
a) High School graduation with English 12 and a minimum of C+ in Math 12, Physics 11 and Chemistry 11. Prerequisites must be current within the last 5 years.
b) Selection interview with program instructors.
c) Applicants with relevant practical experience or special background may be considered.

Program: BIOMEDICAL ENGINEERING TECHNOLOGY

Level 1		Credits
BHSC 1101	Anatomy and Physiology 1	4.0
BMET 1100	Electronics Principles and Practice 1	9.0
CHEM 1107	Chemistry for Biomedical Engineering Technology	6.0
COMM 1178	Technical Writing for Biomedical Engineering Technology	3.0
MATH 1781	Basic Technical Mathematics for Biomedical Engineering Technology	8.0

Level 2		
BHSC 2201	Anatomy and Physiology 2	4.0
BMET 2200	Electronics Principles and Practice 2	10.5
CHEM 2207	Introduction to Organic and Biochemistry	6.5
COMM 2278	Technical Writing for Biomedical Engineering Technology	2.5
ELEX 2860	Electronic Prototype Manufacturing	4.0
MATH 2781	Calculus for Biomedical Engineering Technology	10.5
NURS 1182	Patient Care	1.0

Level 3		Credits
BMET 2310	Digital Electronics	8.0
BMET 3300	Electronics Principles and Practice 3	6.0
BMET 3301	Biomedical Device Technology 1	7.0
ELEX 2820	Measurement for Biomedical Engineering Technology	4.0
MATH 3781	Statistics for Biomedical Engineering Technology	2.0
PHYS 1278	Physics: Biomedical Engineering	3.0

Level 4		
BMET 4401	Biomedical Device Technology 2	6.0
BMET 4402	Biomedical Engineering Technology Project	3.0
BMET 4403	Medical Imaging	5.0
BMET 4410	Digital Systems and Microprocessors	8.0
BMET 4420	Practical Experience in Biomedical Engineering Technology	11.5
CHEM 3411	Instrumental Analysis for Biomedical Engineering Technology	4.0
ELEX 2855	Video Fundamentals	3.0
COMM 3478	Advanced Communication for Biomedical Engineering	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 1101/2201 (BHSC 101/201) Anatomy and Physiology 1 & 2—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 1100 (BMET 100) Electronics Principles and Practice 1—Provides students with basic knowledge of electrical quantities, their units and relationships. The course includes DC and AC circuit analysis techniques for R, RC, RL and RLC circuits. Lab exercises are coordinated with course content.

BMET 2200 (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 1100.

BMET 2310 (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 2200 and MATH 2781.

BMET 3300 (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 2200.

BMET 3301 (BMET 301) Biomedical Device Technology 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 2200, BHSC 2201.

BMET 4401 (BMET 401) Biomedical Devices Technology 2—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 are presented. Lab exercises, coordinated with course content, emphasize calibration and repair techniques. Prerequisite: BMET 3300, 3301, 2310.

BMET 4402 (BMET 402) Biomedical Engineering Technology Project—Students build a device such as an ECG simulator using the latest technology and design techniques. Students gain experience with the implementation of project planning, design, material acquisition, prototyping, printed circuit design, construction, testing, calibration, commissioning and evaluation. A technical report is required for the project. Prerequisite: BMET 3300, 3301, 2310.

BMET 4403 (BMET 403) Medical Imaging—Introduces the concepts involved in imaging systems used in medicine. X-ray, nuclear medicine and ultrasound equipment is examined. Prerequisite: BMET 3300, 3301, BHSC 2201.

BMET 4410 (BMET 410) Digital Systems and Microprocessors—An introduction to microprocessor hardware and software. Topics include: digital arithmetic, memories and mass storage devices, microprocessor architectures, memory and I/O decoding, I/O techniques, interrupts, DMA, LSI/VSLI 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 3300, 2310.

BMET 4420 (BMET 420) Practical Experience in Biomedical Engineering Technology—During this period of training, students gain practical experience in biomedical technology and related fields while working under supervision at a number of hospitals, research agencies and private companies throughout the province. The work experience is four weeks in duration. Prerequisite: BMET 3300, 3301, 4401, 4402, 4403, 4410.

CHEM 1107 (CHEM 107) Chemistry for Biomedical Engineering Technology—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 gravimetric and volumetric quantitative analysis.

CHEM 2207 (CHEM 207) Introduction to Organic and Biochemistry—The naming, properties and main reactions of the major classes of organic compounds are discussed. The biochemistry includes 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 1107.

CHEM 3411 (CHEM 411) Instrumental Analysis for Biomedical Engineering Technology—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 2207.

COMM 1178 (HCOM 104) Technical Writing for Biomedical Engineering Technology—This applied course introduces students to the communication needs of biomedical engineering technologists. It includes organizing and sequencing technical information and writing effective letters and memos. Students will also deliver a formal oral presentation.

COMM 2278 (HCOM 203) Technical Writing for Biomedical Engineering Technology—This course builds on the skills taught in COMM 1178 (HCOM 104). Students will write hospital and industry-oriented reports, prepare a professional job application and deliver a persuasive presentation. Effective meeting and interview skills are also covered. Prerequisite: COMM 1178.

COMM 3478 (HCOM 301) Advanced Communication for Biomedical Engineering Technology—Students will build on the skills learned in COMM 1178 (HCOM 104) and 2278 (203) to write effective reports and a project manual. This operation and service manual is for a device that they design and build in their technology course. In addition, students will update their resumes to graduate level requirements. Prerequisite: COMM 1178, 2278.

ELEX 2820 (ELEC 252) Measurement for Biomedical Engineering Technology—An orientation course covering basic devices for measuring pressure, temperature, density and flow. A study of the principles of analytical 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.

ELEX 2855 (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. Prerequisite: BMET 3300, 2310.

ELEX 2860 (ELEC 260) Electronic Prototype Manufacturing—Through the design and manufacture of specific electronic projects, students learn the skills required to do basic soldering, printed circuit board repair and rework, high reliability soldering, and fabrication of a single-sided printed circuit board. Upon successful completion of the course, the student will be able to demonstrate knowledge of components used in the manufacture of electronic equipment; chassis and metal cabinet design; safe use of tools, and techniques used in electronic fabricating and PWB repair; high reliability soldering, and repair of heat and mechanically damaged PC boards.

MATH 1781 (MATH 178) Basic Technical Mathematics Biomedical Engineering Technology—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, logarithms 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. 12 hours of PC-DOS and Turbo Pascal in preparation for Math 2781.

MATH 2781 (MATH 278) Calculus for Biomedical Engineering Technology— An introduction to differential and integral calculus. Topics include: limits, the derivative, differentiation rules, applied maximum and minimum problems, curve sketching, differentials, antidifferentiation, definite and indefinite integral, area, mean and RMS values, differentiation and integration of the transcendental functions. Fourier Series. First order differential equations. All of these topics will be applied to problems related to the technology. An introduction to Turbo Pascal and its application to numerical method problems. Topics include assignment statements, branching and looping statements, procedures and files. The Boolean algebra section includes the following: numbers in different bases, logic gates, truth tables; Boolean algebra, Karnaugh Maps, design of simple circuits.

MATH 3781 (MATH 378) Statistics for Biomedical Engineering Technology—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.

NURS 1182 (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.

PHYS 1278 (PHYS 324) Physics: Biomedical Engineering—This is a general level course in basic physics with emphasis

on applications to biological systems. The topics 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.

Faculty and Staff

M. Bernadet Ratsoy, B.Sc.N., M.Sc., R.N., Associate Dean
David P.K. Chiu, B.Eng., M.Sc., Ph.D., P.Eng., Program Head
Michael J. Barrett, Dipl.T., A.Sc.T.
Stephan Bauer, B.A.Sc., M.H.Sc.
Joseph Cafazzo, B.A.Sc., M.H.Sc.
Anthony Chan, M.Eng., M.Sc., P.Eng., C.Eng.

CARDIOLOGY/ CARDIOVASCULAR TECHNOLOGY

This two-phase program is designed to fulfil the need for specialized technologists in hospitals where non-invasive and invasive cardiology procedures utilizing sophisticated electrocardiographic and physiological monitoring equipment, are performed. Upon completion of the first year, students will be able to enter the field of Cardiology Technology.

CARDIOLOGY

The program combines lectures, lab and class projects at BCIT as well as clinical experience in designated hospitals. It consists of basic anatomy and physiology with special emphasis on the cardiac and respiratory systems. Students will receive an introduction to basic biomedical electronics and electricity and basic nursing skills. Significant emphasis will be placed on theoretical and clinical application of electrocardiography, cardiac pathology, pacemakers, stress-testing and holter monitoring.

Studies in biomedical electronics, human behavior, mathematics, human physiology and cardiology, ensure graduates a strong background in non-invasive electrocardiography. Courses specific to human behavior, clinical environments and patient care will ensure all students develop the necessary skills to work in this exciting field. Upon completion of the first year, students will receive a Certificate of Technology in Cardiology Technology.

After a designated period of work-related experience, graduates will be eligible to write the registration exam for Cardiology Technologists.

Job Opportunities

First-year graduates will find employment in the electro-diagnostic departments of hospitals and labs which provide EKG testing, stress testing, holter monitoring and pacemaker clinics. Graduates of both levels will be involved in the performance of vital cardiac testing, utilizing a wide range of medical equipment essential for providing the physician with valuable diagnostic information. Cardiology is a fast paced, ever growing medical discipline with opportunities throughout Canada.

Prerequisites

High school graduation with Math 12, Physics 11, Chemistry 11, Biology 12 and English 12, all with C+ or better. Prerequisites should have been completed during the last 5 years. If more than 5 years have elapsed, cases will be assessed individually. CPR 'C' certification required prior to admission. Work-related or volunteer hospital experience is highly recommended. Individuals entering this field should be interested in dealing with potentially critically ill patients and their families. They should have an aptitude/interest in the use of biomedical equipment and the ability to work in an often demanding environment. Applicants are requested to submit resumes, complete with two references and phone numbers, and a 500-word statement indicating their reasons for enrolling in the program. A preadmission interview is conducted to assess applicants' skills and suitability for the field. Completion of student acknowledgement of program requirements and a health form is required.

Program Length

Certificate Program: One year full-time beginning in September each year.

Total Fees (subject to change—does not include book or supply costs)

$1,991.15 for the one-year program (1993/94).

CARDIOVASCULAR TECHNOLOGY

Successful applicants who have completed year one of the program and have been selected to continue will receive a more intensive approach to cardiac pathophysiology, cardiac anatomy, chemistry, physics and the theoretical and clinical application of cardiovascular dynamics. Emphasis will be placed on diagnostic and interventional procedures performed in the cardiac cath lab. Graduates will receive a Diploma of Technology in Cardiovascular Technology. After a period of work-related experience graduates will be eligible to write the national registration exams for the appropriate certifying body.

Job Opportunities

Second-year graduates will be qualified to work in cardiovascular and cardiac electrophysiology labs in major cardiac centres. Registered Cardiovascular Technologists will be employed in major cardiac centres.

Prerequisites

Candidates must apply for admission to this one-year program. Application forms must be accompanied by transcripts, a cover letter, and reference from current employer if applicable. Admission will be based on academic and clinical performance in the Cardiology/Cardiovascular Technology program; an interview will be conducted.

Program Length

One year full-time September to June.

Total Fees (subject to change—does not include book or supply costs)
$1,991.15 for the one-year program (1993/94).

Program: CARDIOLOGY

Level 1		Credits
BHSC 1102	Anatomy and Physiology	4.0
BMET 1382	Electrical Circuits	2.0
CARD 1150	Electrocardiographic Theory & Principles or ECG Theory & Principles	12.0
NURS 1185	Patient Care	4.0
COMM 1186	Communication in Cardiology	4.0
BHSC 1145	Human Behavior	4.0

Level 2		
BHSC 2202	Anatomy and Physiology 2	4.5
BMET 2482	Applied Electrical Fundamentals	2.5
CARD 2250	Cardiology Devices and Techniques	13.0
CARD 2251	Cardiology Practicum 1	20.0
COMM 2286	Communication for Cardiology	5.5
MATH 1861	Basic Technical Mathematic for Cardiology	5.0

Option: CARDIOVASCULAR TECHNOLOGY

Proposed Curriculum

Level 3		
BHSC 3302	Cardiac Pathology	4.0
CARD 3350	Cardiovascular Technology	9.0
CARD 3351	Cardiovascular Technology Practicum	8.0
CHEM 1107	Chemistry for Biomedical Engineering	6.0
PHYS 3286	Physical Principles: Cardiology	4.0

Level 4		
CARD 4451	Clinical Experience in Cardiovascular Technology	46.5

Course Descriptions

BHSC 1102 (BHSC 102) Anatomy and Physiology—This course is an introduction to homeostasis, terminology, cytology, histology, the integument, and the cardiovascular, lymphatic, and respiratory systems. Emphasis is placed on the cardiovascular system and the embryologic development of the heart.

BHSC 1145 (BHSC 145) Human Behavior—Basic considerations of behavioral science relevant to cardiology 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.

BHSC 2202 (BHSC 202) Anatomy and Physiology 2—This course is a continuation of BHSC 102 and covers basic anatomy and physiology of the remaining body systems. Prerequisite: BHSC 1102.

BHSC 3302 (BHSC 302) Cardiac Pathology—A comprehensive study of cardiac disorders emphasizing the concept of disease as a disturbance of normal structure and function. The course will begin with a discussion of fundamental disease processes, followed by detailed examination of specific cardiac pathologies. Systemic diseases and malfunction of organ systems which initiate or are a consequence of cardiac failure will also be discussed. Prerequisite: BHSC 1102, 2202.

BMET 1382 (BMET 382) Electrical Circuits—Students become familiar with AC and DC circuits as well as other electrical building blocks. Prerequisite: MATH 1861.

BMET 2482 (BMET 482) Applied Electrical Fundamentals—This course is a continuation of BMET 382. Topics include review of magnetism, inductance, motors, transformers, capacitance, electrical safety and principles. Prerequisite: BMET 1382.

CARD 1150 (CARD 150) Electrocardiographic Theory and Principles or ECG Theory and Principles—A study of the electrocardiographic theory and principles required to perform 12-lead electrocardiograms. Instruction in ECG graph interpretation to identify cardiac rate, axis, arrhythmias, myocardial infarctions, ischemia and other ECG anomalies. The course will further include an introduction to cardiac stress testing, artificial pacemaker evaluation and 24-hour holter monitoring and cardiac pharmacology.

CARD 2250 (CARD 250) Cardiology Devices and Techniques—A study of advanced electrocardiographic theory and principles with a practical application for recording and interpreting ECG's for abnormalities in a laboratory setting. The course will include advanced cardiac arrhythmia recognition and telemetry monitoring as well as continued work in stress-testing application, pacemaker analysis and interpretation and holter monitor scanning. Prerequisite: CARD 1150.

CARD 2251 (CARD 251) Cardiology Practicum 1—Students will rotate through the ECG departments of various hospitals to obtain clinical experience in performing electrocardiograms, stress testing, holter scanning and pacemaker evaluation. The rotation will consist of two days per week for the length of the term. Specific projects are assigned throughout the semester to insure competency within the prescribed objectives. Prerequisite: CARD 2250.

CARD 3350 (CARD 350) Cardiovascular Technology—This course will interrelate closely with human anatomy and cardiopathophysiology. The interrelationships of the cardiac and pulmonary systems will be presented in terms of their mechanical, electrical and dynamic components as they are observed and measured in the Cardiac Cath Lab. Methods of hemodynamic data collection, calculation and analysis will be presented. This course will further introduce the principles of modern techniques for the diagnosis and treatment of cardiovascular diseases in the area of invasive cardiology. Further emphasis will be placed on cardiac pharmacology as it relates to the treatment of cardiac disease. Prerequisite: CARD 2250, BHSC 2202.

CARD 3351 (CARD 351) Cardiovascular Technology Practicum—An introduction to clinical diagnostic testing, patient care, patient-technician relationships and interaction with other medical professionals in the Cardiac Cath Lab setting. The course is offered two mornings a week for the length of term. Prerequisite: CARD 2251.

CARD 4451 (CARD 451) Clinical Experience in Cardiovascular Technology—This course is designed to perfect clinical, manipulative and cognitive skills in the utilization of cardiovascular instrumentation and techniques. Students will rotate through the various Cath Labs and Electrophysiology Labs of designated hospitals. Specific projects are assigned throughout the semester to insure competency within the prescribed objectives. Prerequisite: CARD 3350, 3351.

CHEM 1107 (CHEM 107) Chemistry for Biomedical Engineering Technology—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 gravimetric and volumetric quantitative analysis.

COMM 1186 (HCOM 115) Communication for Cardiology—Emphasizes clear, concise technical writing in the cardiology field. Students will learn how to write for specific audiences, how to make technical descriptions accurate and readable, how to present oral information effectively. The course includes memos, letters, reports, technical descriptions, job

resume and application letters, information interviews, and oral presentations.

COMM 2286 (HCOM 215) Communication for Cardiology—A continuation of COMM 1186 (HCOM 115). In the second term students will apply the skills they developed in COMM 1186 (HCOM 115) to oral and written projects of greater length. This course includes interviews, oral and written reports, meetings, conflict resolution, writing for professional publications. Prerequisite: COMM 1186.

MATH 1861 (MATH 179) Basic Technical Mathematics for Cardiology—Review of arithmetic with approximate numbers, unit conversion and percent. The equation of a straight line and solution of systems of linear equations with applications to chemical mixtures, etc. Properties of exponential and logarithmic functions and their manipulation; exponential and logarithmic graphs; solving exponential and logarithmic equations with applications to exponential growth and decay, light absorption, Ph scale, decibel scale, etc. Semi-log and log-log graphs with applications, transients, time constants. Right angle trigonometry review, trigonometric functions of an angle, radian measure, oblique triangles, sine and cosine laws, vectors, graphs of trigonometric functions, voltage and impedance triangles, current and admittance triangles.

NURS 1185 (GNNU 185) 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.

PHYS 3286 (PHYS 330) Physical Principles: Cardiology—An exploration of basic physical principles employed in theory and practice in the field of cardiology. A problem-solving approach will be applied consistently throughout the course. Topics include biomechanics, fluid mechanics (with special emphasis on cardiac hemodynamics), tissue temperature regulation, the gas laws and respiration. In addition, wave theory, sound and ultrasound, electricity and magnetism, light and lasers will be covered, with special emphasis on biological impedance and instrumentation.

Faculty and Staff

Verna Magee Shepherd, M.Sc., CHE, Associate Dean
Gary M. Clifton, Dipl.T., B.Sc., R.C.V.T., Program Head
Kristin Warburton, Dipl.T., A.R.C.T.

CYTOGENETICS LABORATORY TECHNOLOGY

Post-diploma Program

Clinical Cytogenetics deals with the analysis of human chromosomes for diagnosis and prognosis of disease. Cytogenetics Laboratory Technology (CGLT) is the area of specialization in laboratory medicine which investigates the chromosome bands and chromosome number in human cells. It involves the culture of different tissues and the production of banded metaphases to reveal chromosome abnormalities.

Employment Opportunities

Upon graduation and successful completion of the certification exams of the Canadian Society of Laboratory Technologists (CSLT), the CGLT technologist may be employed in cytogenetic laboratories found in larger hospitals throughout Canada. Beginning salaries for entry level positions range from $37,000 /annum to $44,000 /annum.

The Program

The training program is 13 months in length and consists of a didactic phase of 27 weeks of academic studies at the Institute and a 6-week clinical orientation phase which combines lectures and labs at the Institute with practical experience in an affiliated hospital laboratory. This is followed by a 22-week clinical phase during which the student will spend all of the remaining time in one of the clinical facilities affiliated with the program. After successful completion of each of the three phases, the student is eligible to write the Certification Examination of the Canadian Society of Laboratory Technologists, which leads to the qualification of Registered Technologist (R.T.) in Cytogenetics, the nationally recognized qualification for employment in the field.

Affiliate Training Facilities

There are four clinical training laboratories affiliated with the CGLT program: B.C. Children's Hospital, Vancouver General Hospital, B.C. Cancer Agency, and the Royal Columbian Hospital.

Program Length

13 months full-time beginning in September each year.

Total Fees (subject to change—does not include book or supply costs)

$1,991.15 for the 13-month program (1993/94).

Prerequisites

B.Sc. in Cell Biology with emphasis on genetics and medical/molecular genetics or current certification with the CSLT (R.T.) in general Medical Laboratory Technology with academic prerequisites for fourth-year university courses in genetics and medical/molecular genetics.

Students are selected to the program on the basis of academic prerequisites, suitability to the field and work-related experience. Comprehensive interviews by BCIT staff and clinical site staff are conducted. Due to new techniques being introduced to the field, applicants to the program will only be considered if they are able to detect color difference in the visible spectrum.

The Cytogenetics Laboratory Technology program will start on September 7, 1994.

COURSE OF STUDIES

Didactic Phase

Level 5 (16 weeks including exam week)

			Credits
BHSC	1104	or equivalent Anatomy and Physiology (10 wks)	4.0
BHSC	1121	or equivalent Introductory Principles of Immunology (10 wks)	3.5
CGLT	5501	Introduction to Cytogenetics Laboratory Technology (second part is given in Level 6)	9.5
CGLT	5502	Chromosome Analysis 1	10.0
CGLT	5503	Seminar Assignments 1	1.0
CGLT	5504	Darkroom Photography 1	3.0
CGLT	5505	Technical Assignment 1 (Fish)	2.5
MLAB	1113	Introductory Hematology for Cytogenetics (4 wks)	2.0

Level 6 (11 weeks including exam week)

CGLT	6601	Advanced Cytogenetics Laboratory Technology	12.5
CGLT	6602	Chromosome Analysis 2	8.5
CGLT	6603	Seminar Assignments 2	1.0
CGLT	6604	Darkroom Photography 2	2.0
CGLT	6605	Technical Assignment 2	3.0

Spring Break: March, 1995

Clinical Orientation Phase (6 Wks)

CGLT	6605	Technical Assignment 2 contd.	3.5
CGLT	6606	Clinical Orientation	10.5

Clinical Phase (22 Wks)

CGLT	6607	Clinical Training	50.0

Course Descriptions

BHSC 1104 (BHSC 104) Anatomy and Physiology—A systematic approach to the study of human anatomy and physiology for cytogenetics laboratory technology students. The course includes basic cytology and an introduction to the skeletal, muscular, nervous, circulatory, respiratory, digestive, urinary and reproductive systems.

BHSC 1121 (BHSC 121) Introductory Principles of Immunology—A basic course designed to give cytogenetic laboratory technology students, 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/hyper-sensitivities, their characteristics and management; immune deficiency diseases and auto-immunity.

CGLT 5501 (CGLT 501) Introduction to Cytogenetics Laboratory Technology—An introductory course with extensive hands-on training, demonstrations, and lectures on the principles and methodologies of clinical cytogenetics technology. The student is introduced to the theoretical and practical aspects involved in cell growth and culture as they relate to major tissue culture laboratory procedures. The principles and practical application of various banding techniques are studied as they relate to the human tissue types such as amniotic fluid, chorionic fluid, fibroblasts and products of conception. Cytogenetic syndromes will be introduced.

CGLT 5502 (CGLT 502) Chromosome Analysis 1—A wide range of metaphase chromosomes in print and microscopic form are studied to introduce students to the human chromosome karyotype. Both abnormal and normal metaphases are examined. Results are described according to the 1985 ISCN (International Standard Chromosome Nomenclature).

CGLT 5503 (CGLT 503) Seminar Assignments 1—Students are assigned topics from the R.T. (Subject, CGLT) Syllabus to research and study in consultation with the instructor and present to the class.

CGLT 5504 (CGLT 504) Darkroom Photography 1—Students learn to use darkroom equipment to produce high quality negatives and prints of cell metaphases, taken with a standard Nikon photomicroscope. Theoretical and practical aspects of equipment, film, paper and chemicals will be introduced.

CGLT 5505 (CGLT 505) Technical Assignment 1 (FISH)—Students are introduced to the concepts of molecular cytogenetics technology and will learn the skills required to perform interphase cytogenetics and interpret their results.

CGLT 6601 (CGLT 601) Advanced Cytogenetics Laboratory Technology—A continuation of CGLT 5501 with emphasis on quality and timely chromosome results. The blood culture techniques used primarily are routine and prophase technology. Special banding and procedures will be emphasized and discussed relative to when and why they are used in clinical cytogenetics. Prerequisite: CGLT 5501.

CGLT 6602 (CGLT 602) Chromosome Analysis 2—A challenging series of prints and slides will be used to stimulate knowledge gained from lessons and practise in Term 1. Prerequisite: CGLT 5502.

CGLT 6603 (CGLT 603) Seminar Assignments 2—Students are assigned topics from the current cytogenetic literature as well as aspects of the work not covered in class.

CGLT 6604 (CGLT 604) Darkroom Photography 2—Students learn to organize all aspects of producing a complete cytogenetics report including photography. Enhancement of the microscopic image reproduced on paper for maximum reproduction is stressed. The student learns the role of the cytogenetics technologist in the photographic darkroom.

CGLT 6605 (CGLT 605) Technical Assignment 2—The student is given a technically more difficult assignment based on the technical skills and theory demonstrated in CGLT 5501 and 6601. Topics are assigned by the instructor, a plan is drafted by the student, experiments are conducted and a final report is submitted.

CGLT 6606 (CGLT 606) Clinical Orientation—Students spend a decreasing amount of time in formal instruction at the Institute and an increasing amount of time at one of the affiliated hospital cytogenetics laboratories.

CGLT 6607 (CGLT 607) Clinical Training—Students are assigned to various sub-sections of one of the affiliated cytogenetics laboratories. The clinical experience will vary amongst the major tissue types; productivity expectations will be approximately 80% of manual workloads per training technologist.

MLAB 1113 (113) Introductory Hematology For Cytogenetics—This course introduces the student to the origin, development and function of white blood cells. Both theoretical and practical knowledge are introduced.

Faculty and Staff

Verna Magee Shepherd, M.Sc., CHE,
Associate Dean
Fred Bauder, B.Sc., A.R.T. (Cg), CLSp (Cg),
Program Head

Clinical Instructors for Cytogenetics Laboratory Technology Affiliated Hospitals and Clinical Sites

B.C. Cancer Agency
Helena Gosling, M.Sc., R.T. (Cg.)
Cytogenetics Laboratory
B.C. Children's Hospital
Sharon O'Brien, R.T.
Cytogenetic/Embryopath Laboratory
Royal Columbian Hospital
Vancouver General Hospital
Chris Haessig, B.Sc., R.T. (Cg.)
Wilma Roodbergen, R.T. (Cg.)
Cytogenetics Laboratory

DIAGNOSTIC MEDICAL SONOGRAPHY

Post-diploma Program

Diagnostic Medical Sonography (Ultrasound) is a rapidly expanding medical technique. High frequency sound waves are emitted from a probe (transducer) that is moved over the body. Images of various body structures are obtained. This technique provides valuable diagnostic information regarding the underlying anatomy and pathology that may be present. Unlike X-rays, diagnostic ultrasound is a non-ionizing technique. To date, no significant biological effects have been demonstrated.

A Diagnostic Medical Sonographer is a medical professional who performs ultrasound examinations, under the supervision of a physician. Areas of particular interest are the abdomen, the pregnant and non-pregnant female pelvis, the vascular system and the heart.

A good sonographer must possess the ability to:

- obtain diagnostic images
- correlate clinical and diagnostic findings
- work efficiently in an often stressful environment
- communicate well verbally and in writing
- visualize anatomy in three dimensions
- provide high quality patient care
- physically assist in moving patients and equipment.

Job Opportunities

Graduates in this dynamic allied health field will assume an important role in maintaining high quality patient care using this diagnostic imaging technique. Employment opportunities exist in hospitals, clinics, commercial areas, and research. Most graduates work on a casual basis initially, moving into full-time employment within one year. Salaries for sonographers, based upon the current HSA scale, range from $19 to $24 per hour.

The Program

Due to the entrance requirements of knowledge in allied health, the basic program is one year (12 months) in length. The first term has a focus on academics with some clinical experience. Through the remaining 8 months, clinical applications are emphasized.

Students may elect to learn echocardiography as their primary interest in a one-year program, or as a four-month specialization upon completion of a general program.

Graduates of this program are eligible to write the American Registry of Diagnostic Medical Sonography examinations upon completion.

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

All applications will be reviewed and interview decisions will be made based upon full meeting of the prerequisite conditions plus the following:

1. Recent, relevant clinical experience.
2. Autobiographical letter (500 words) to include a brief history and reasons for choosing sonography as a career.
3. Pre-application investigation of the field.
4. Professional achievements (to include relevant continuing education, publications, etc.).
5. Three letters of reference (to be submitted directly to admissions or the program head by the referee). The references must be obtained from a person in a supervisory capacity and should refer to the applicants' ability to learn, communication skills, ability to work in stressful environment, patient care skills and physical stamina as applicable.
6. Post-secondary education transcripts.
7. Resume.

Selection Process

Applications are received after January 1 of the year being applied for. The completed applications are reviewed in February and March. The most suitable candidates, based upon their applications, will be invited to an interview, with final selection following the interviews. Interviews are conducted in late April/early May by sonographers and physicians involved with the program.

Acceptance Criteria

Following provisional acceptance after the interview, full acceptance into the program will be granted upon submission of:

1. Proof of current Cardiopulmonary Resuscitation (Level C)
2. A signed consent for full participation in scan labs held at BCIT
3. A completed health form.

BCIT Requirements

Please see the full-time calendar, Admission Section, for standard BCIT admission requirements (original documents, proof of name change, English proficiency, immigrant status, etc.).

Total Fees (subject to change—does not include book or supply costs)

$1,991.15 for the one-year program (1993/94).

Program: DIAGNOSTIC MEDICAL SONOGRAPHY

Core—All Students September—December

Level 5 (15 weeks including exam week)

		Credits
BHSC 5507	Anatomy and Physiology, Pathophysiology	3.0
DSON 5101	Echocardiography	3.0
DSON 5102	Abdominal Sonography 1	9.0
DSON 5103	Obstetrical/Gynecology Sonography 1	8.0
PHYS 5273	Physics for Ultrasound	4.5

Specialty Option 1 (January—August)
Level 6 (35 weeks including exam week and spring break)

DSON 6102	Abdominal Sonography 2	26.0
DSON 6103	Obstetrical/ Gynecological Sonography 2	26.0
DSON 6104	Vascular Sonography	13.0

Specialty Option 2 (January—August)
Level 6 (35 weeks including exam week and spring break)

DSON 6101	Adult Echocardiography	22.5
DSON 6603	Cardiac Pathophysiology	1.0

All courses have a 60% pass mark.

Course Descriptions

BHSC 5507 (BHSC 507) Anatomy and Physiology, Pathophysiology—This course provides an overview of the organ systems of particular interest to sonographers. Special emphasis is placed on the genito-urinary, digestive (including liver, gallbladder and pancreas) and cardiovascular systems as well as cross-sectional anatomy of the abdominopelvic cavity. Fetal development is discussed. In addition, an outline of the etiology and pathogenesis of diseases commonly investigated by ultrasonography is examined.

BHSC 6603 (BHCE 603) Cardiac Pathophysiology—This course provides an outline of the etiology and pathogenesis of cardiac pathology as seen by ultrasound techniques.

DSON 5101 (DSON 502) Echocardiography—The student will acquire the theory to recognize normal cardiac structures and some common pathologies. A brief clinical orientation is included.

DSON 5102 (DSON 503) Abdominal Sonography 1—The student will acquire the

theory and skills to recognize normal structures and common pathology in the abdomen, in addition to gaining some clinical skills.

DSON 5103 (DSON 504) Obstetrical/Gynecological Sonography 1—The student will acquire the theory and skills to recognize normal structures and common pathology in the pregnant and non-pregnant pelvis, in addition to gaining some clinical skills.

DSON 6102 (DSON 603) Abdominal Sonography 2—This course is a continuation of DSON 5102, with a greater emphasis on clinical skills and applications.

DSON 6103 (DSON 604) Obstetrical/Gynecological Sonography 3—This course is a continuation of DSON 5102, with a greater emphasis on clinical skills and applications.

DSON 6104 (DSON 605) Vascular Sonography—The student will acquire the theory and skills to recognize normal and abnormal structures and Doppler patterns in the vascular system, in addition to gaining some clinical skills.

DSON 7101 (DSCE 607) Adult Echocardiography—This course is a continuation of DSON 5101. The student will acquire the theory and skills to recognize and document normal and abnormal cardiac structures and demonstrate an understanding of the hemodynamic principles involved.

PHYS 5273 (PHYS 523) Physics for Ultrasound—This introductory level course is based on the syllabus of studies for the ARDMS Ultrasound Physics and Instrumentation Exam. Course topics include acoustic waves, transducers, beam formation, ultrasonic imaging and artifacts, pulse echo instrumentation, real time systems, doppler effect, doppler instrumentation, image storage and display, acoustic power measurements and biological effect.

Faculty and Staff

Verna Magee Shepherd, M.Sc., CHE, Associate Dean
Anne Rhodes, R.D.M.S., Program Head
Danelda Johnston, R.D.M.S.

Clinical Coordinators and Instructors for Affiliated Hospitals

Burnaby Hospital
Dixie Cowi, R.D.M.S.
Children's Hospital
Mumtaz Karmali, R.D.M.S.
Eagle Ridge Hospital
Dianne Hagen, R.D.M.S.
Grace Hospital
Vickie Lessoway, R.D.M.S.
Kelowna General Hospital
Jennifer Charles, R.D.M.S.
Lions Gate Hospital
Donna Armstrong, R.D.M.S.
Michele Stasiuk, R.D.M.S.
Royal Columbian Hospital
Janet Graham, B.Sc., R.D.M.S.
Royal Jubilee Hospital (Victoria)
Lois Matthews, R.D.M.S.
St. Paul's Hospital
Brenda Harrigan, R.D.M.S.
Roz Gillis, B.Sc.
Surrey Memorial Hospital
Heather Gretchen, R.D.M.S.
University Hospital, UBC Site
Anne Hope, R.D.M.S.
Vancouver General Hospital
Wendy Forrest, R.D.M.S.
Briege McConville

ELECTRONEURO-PHYSIOLOGY TECHNOLOGY

Diploma Program

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. Courses in the basic health sciences will inform the student about human physiology and the biological signals to be measured. In addition, courses in the social sciences will prepare the student for interpersonal relationships within 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 will principally find employment in Diagnostic Neurophysiology Departments of hospitals or private clinics in the following fields: electroencephalography (electrical activity of the brain), electromyography (electrical activity of the neuro-muscular system), evoked potentials (electrical activity generated by stimulation of the sensory systems), and polysomnography (electrical activity of the body during sleep). 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 and perform quality control procedures on equipment and basic 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 major hospitals.

In both spring and fall terms, special courses in Electroneurophysiology, Neuroanatomy and Neuropathology 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, evoked potentials and polysomnography.

Upon completion of the two-year program, graduates will receive a Diploma of Technology in Electroneurophysiology. After a period of work experience in a clinical situation, graduates will become eligible to write the Technologist Registration Examinations of the appropriate certifying body in their chosen fields of interest.

Program Length

Two years full-time beginning in September each year.

Total Fees (subject to change—does not include book or supply costs)

$3,965.30 for the two-year program (1993/94).

Prerequisites

High school graduation with Math 12, Physics 11, Chemistry 11, and English 12 all with C+, 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 and electrical and mechanical apparatus. Applicants who have special backgrounds and/or experience will also be considered on an individual basis. Most courses taken within the program require successful completion of certain prerequisites. Documented competence in Cardio-Pulmonary Rescusitation (CPR) is a program prerequisite. Based on the documentation submitted, the most suitable applicants will be invited to an interview. A health form and student acknowledgement of program requirements are part of application packages. *Electroneurophysiology is currently under curriculum review. There may be adjustments to the courses described below.

Program: ELECTRONEUROPHYSIOLOGY

Level 1		Credits
BHSC 1112	Anatomy and Physiology	4.0
CHEM 1117	Chemistry	6.0
COMM 1179	Communication for Electroneurophysiology	4.0
ENPY 1150	Electroneurophysiology	9.0
MATH 1791	Basic Technical Mathematics for Electroneurophysiology	5.0

Level 2		
BHSC 2212	Anatomy and Physiology	5.5
COMM 2279	Communication for Electroneurophysiology	2.5
ENPY 2250	Introduction to Clinical EEG and NCS	9.5
MATH 2791	Statistics, Calculus, and Numerical Methods for Electroneurophysiology	8.0
NURS 1181	Patient Care	4.0

Level 3		
BHSC 1339	Human Behavior	4.0
BHSC 3312	Neuroanatomy and Physiology	6.0
ENPY 3350	Introduction to EMG, EP and PSG	9.0
ENPY 3351	Introduction to Clinical EEG Practice	8.0
PHYS 1278	Physics: Electroneurophysiology	3.0

Level 4		
ENPY 4450	Electroneurophysiology Practicum	46.5

Most courses taken within the program require successful completion of certain prerequisites.

Course Descriptions

BHSC 1112 (BHSC 111) Anatomy and Physiology—A basic introductory course in human anatomy and physiology which uses the systems approach. It provides electroneurophysiology students with terminology and physiological concepts likely to be encountered during the first term of the program.

BHSC 1339 (BHSC 339) Human Behavior—Basic considerations of behavioral science relevant to the electroneurophysiology technologist's concerns will be explored. Theory and research findings dealing with stress and illness behaviour 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.

BHSC 2212 (BHSC 212) Anatomy and Physiology—Builds on information given in BHSC 1112, which is prerequisite. Emphasis is placed on the human anatomy and physiology of most interest to the electroneurophysiology 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 3312, Neuroanatomy and Physiology.

BHSC 3312 (BHSC 312) Neuroanatomy and Physiology—Provides a basic understanding of anatomy, physiology and pathophysiology of immediate relevance to the current practice of electroneurophysiology. Emphasis is placed on the structure and function of the nervous system and selected pathophysiological states.

CHEM 1117 (CHEM 117) Chemistry—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 gravimetric and volumetric quantitative analysis.

COMM 1179 (HCOM 113) Communication for Electroneurophysiology—This course emphasizes clear, concise, technical writing in the electroneurophysiology field. Students learn how to write for specific audiences, how to make technical descriptions accurate and readable, and how to present oral information effectively. The course includes memos, letters, reports, technical descriptions, job resumes and application letters, information interviews and oral presentations.

COMM 2279 (HCOM 213) Communication for Electroneurophysiology—This course is a continuation of COMM 1179 (HCOM 113). Students apply the skills they have learned to oral and written projects of greater length. The course includes interviews, oral and written reports, meetings, conflict resolution, and writing for professional publications. Prerequisite: COMM 1179.

ENPY 1150 (ENPY 150) Electroneurophysiology—Provides the basic electrical/electronic knowledge and skills needed by technologist practitioners of EEG/Electroneurophysiology. Emphasis will be on dealing with problems encountered in the clinical environment.

ENPY 2250 (ENPY 250) Introduction to Clinical EEG and NCS—Introduces the student to devices and techniques used in clinical EEG laboratory practice. Correct placement and application of electrodes for this technique are 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 3350 (ENPY 350) Introduction to EMG, EP and PSG—Students will be instructed for practical competence in the performance and technical interpretation of the following clinical electrodiagnostic procedures: visual evoked potentials, somatosensory evoked potentials, brainstem auditory evoked potentials, EMG, polysomnography (diagnosis of sleep disorders).

ENPY 3351 (ENPY 351) Introduction to Clinical EEG Practice—Scheduled at local hospital EEG laboratories, this course will provide hands-on patient contact under direct supervision, in preparation for fourth term practicum experience.

ENPY 4450 (ENPY 450) Electroneurophysiology Practicum—An appropriate amount of time is spent in each of the following clinical areas: EEG, EMG, polysomnography (diagnosis of sleep disorders). Program will be tailored to the specific student. Clinical work may be out-of-town. Prerequisite: ENPY 3350, 3351.

MATH 1791 (MATH 179) Basic Technical Mathematics for Electroneurophysiology—Review of arithmetic with approximate numbers, unit conversion and percent. The equation of a

straight line and solution of systems of linear equations with applications to chemical mixtures, etc. Properties of exponential and logarithmic functions and their manipulation; exponential and logarithmic graphs; solving exponential and logarithmic equations with applications to exponential growth and decay, light absorption, Ph scale, decibel scale, etc. Semi-log and log-log graphs with applications, transients, time constants. Right angle trigonometry review, trigonometric functions of an angle, radian measure, oblique triangles, sine and cosine laws, vectors, graphs of trigonometric functions, voltage and impedance triangles, current and admittance triangles.

MATH 2791 (MATH 279) Basic Statistics, Calculus and Numerical Methods for Electroneurophysiology—Descriptive statistics, basic probability distributions including the binomial, Poisson and normal distributions. Sampling and sampling distributions; introduction to statistical inference; point and interval estimates of the population mean and population proportion, large and small sample cases; introduction to concepts of hypothesis testing. Differential and integral calculus for algebraic functions, maximum and minimum problems, differentials and applications in error analysis, calculation of area under a curve, rms and average values and other applications in electroneurophysiology. Introduction to calculus of trigonometric functions and basic concepts of Fourier series and related topics. Introduction to computer applications on the IBM-PC, MS-DOS, use of spreadsheet software or a programming environment to carry out basic numerical algorithms, computer simulations, and graphical display of results, related to topics in this and other courses of the program.

NURS 1181 (GNNU 181) 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.

PHYS 1278 (PHYS 324) Physics: Electroneurophysiology—This is a general level course in basic physics with emphasis on applications to biological systems. Topics 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.

Faculty and Staff

Verna Magee Shepherd, M.Sc., CHE, Associate Dean
Karin Liddle, R.E.T.

ENVIRONMENTAL HEALTH: PUBLIC HEALTH INSPECTOR TRAINING PROGRAM

Diploma Program

The Public Health Inspector/Environmental Health Officer is a vital member of the public health team and delivery system, whose role includes preventing disease, promoting health and improving the environment through the use of education, consultation, inspection and monitoring techniques and, if necessary, by the enforcement of health legislation. The scope of interest covers 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 the public's 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. Proficiency is required in problem-solving and decision-making.

Job Opportunities

Employment possibilities 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. This has been found 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 experiences. Environmental health is a complex and rapidly changing area of human endeavour. A firm foundation of education and experience in science and health is provided to allow this field to be dealt with.

Prerequisites

High School graduation with English 12, Math 12, Physics 11, Biology 11 and Chemistry 12 are requirements for this program. Preference is given to applicants who have completed their prerequisites within five years of applying, and have achieved a C+ standing in these courses. Preference may also be given to applicants who have successfully completed Biology 12. Applicants must be in good health with adequate hearing and vision. An up-to-date immunization program is suggested for applicants accepted into the program. The nature of the work precludes individuals who are physically impaired. Applicants should be able to show evidence of maturity, have a positive outlook and an interest in serving the community. Applicant priority may be given to Canadian citizens and landed immigrants who have resided in the four western provinces for the immediate 12 months prior to enrolment.

Program Length

Two years full-time beginning in September each year.

Total Fees (subject to change—does not include book or supply costs)

$3,965.30 for the two-year program (1993/94).

Post-graduation

In addition to completing the requirements of the two-year program leading to a Diploma of Technology, graduates must satisfactorily complete 24 weeks of practicum training in a recognized health unit in Canada under the direction of a Public Health Inspector or Environmental Health Officer. 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.

Note: Environmental Health is currently under curriculum review. There may be adjustments to the courses described below.

Program: ENVIRONMENTAL HEALTH

Level 1		Credits
BHSC 1123	Microbiology	3.0
CHEM 1108	Chemistry for Environmental Health	6.0
COMM 1182	Communication for Environmental Health	3.0
ENVH 1124	Pest Control	2.5
ENVH 1141	Food Hygiene 1	4.0
ENVH 1142	Public Health Inspection 1	4.0
ENVH 1143	Environmental Health and Engineering 1	4.0
MATH 1821	Basic Technical Mathematics for Environmental Health	.0

Level 2		Credits
BHSC 1204	Anatomy and Physiology	2.5
BHSC 2223	Microbiology 2	4.0
CHEM 2208	Chemistry 2 for Environmental Health 2	8.0
COMM 2282	Communication for Environmental Health	4.0
ENVH 2231	Food Hygiene 2	2.5
ENVH 2232	Public Health Inspection 2	2.5
ENVH 2266	Epidemiology and Biostatistics	5.5
ENVH 2275	Drinking Water and Waste Disposal	7.5
PHYS 1282	Physics: Environmental Health	4.5

Level 3		
CHEM 3313	Instrumental Analytical Methods for Environmental Health	4.0
ENVH 3331	Food Hygiene 3	2.0
ENVH 3332	Public Health Inspection 3	2.0
ENVH 3337	Public Health Administration 1	2.0
ENVH 3350	Industrial Hygiene 1: Noise	5.0
ENVH 3358	Environmental Health Relations	5.0
ENVH 3379	Technical Research Methods 1	7.0

Level 4		
BHSC 3423	Communicable Disease Control	5.5
CHEM 3419	Industrial Chemistry for Environmental Health	2.5
CHSC 3413	Environmental Analytical Methods	4.0
ENVH 2453	Environmental Health and Engineering 2	4.0
ENVH 4437	Public Health Administration 2	2.5
ENVH 4456	Public Health Law	4.0
ENVH 4459	Technical Research Methods 2	4.0
ENVH 4470	Industrial Hygiene and Toxicology	6.5
ENVH 4471	Food Hygiene	6.5

Course Descriptions

BHSC 1123 (BHSC 123) Microbiology—An introductory course in microbiology which prepares the student for the applied microbiology in BHSC 2223 and which graduates will use in their daily work. The course includes a discussion of the structure, physiological characteristics and pathogenesis of bacteria, viruses, fungi and protozoan parasites. An introduction to body defense, immunity and basic immunizations is included.

BHSC 1204 (BHSC 204) Basic Anatomy and Physiology—Provides 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 2223 (BHSC 223) Public Health and Pollution Control Microbiology—Building on the basic concepts of BHSC 1123, the course deals with the applied concepts of microbiology to public health. The course deals with the proper collection and handling of specimens and the basic microbiology of water, foods and foodborne illnesses, milk and dairy products, waste water and waste water treatment. Prerequisite: BHSC 1123.

BHSC 3423 (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. Prerequisite: BHSC 2223.

CHEM 1108 (CHEM 108) Chemistry 1 for Environmental Health—A general chemistry course for environmental health. Topics include chemical symbols, formulae, acid base reactions, calculations 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 2208 (CHEM 208) Chemistry 2 for Environmental Health— An introduction to organic biochemistry and a selection of topics of interest to Environmental Health. Organic chemistry includes 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 1108.

CHEM 3313 (CHEM 313) Instrumental Analytical Methods for Environmental Health—Principles and laboratory procedures for 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 1108.

CHEM 3419 (CHEM 419) Industrial Chemistry for Environmental Health—Provides an overview of the chemical processes used in industry, chemicals, chemical reactions, products manufactured, waste products, pollutants and the hazards to personnel. Students will make field trips to selected industries. Prerequisite: CHEM 2208.

CHSC 3413 (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. Prerequisite: CHEM 3313.

COMM 1182 (HCOM 106) Communication for Environmental Health—This applied course introduces students to the communication needs of professionals working in the environmental health field. 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.

COMM 2282 (HCOM 205) Communication for Environmental Health—This course builds on skills learned in COMM 1182 and adds incident, inspection and investigation reports, proposals, and a professional job application package. Meetings and interviewing skills are also covered. Students propose, design and sell a training module for an environmental health topic. Prerequisite: COMM 1182.

ENVH 1124 (ENVH 124) Pest Control—An introduction to pests of public health significance. Through lectures and laboratories, the student will examine the life history, health significance and methods of identification of pests encountered by the graduate. Current chemical, physical and biological control methods are examined in detail.

ENVH 1141 (ENVH 141) Food Hygiene 1—Examines the public health concerns associated with the food industry. Specific attention is directed to legislative control and enforcement, inspection techniques, causes and investigation of food-borne illnesses, microbiological concerns and educational programs, as these apply to the food industry in production, processing, handling, storage, service display, construction and materials.

ENVH 1142 (ENVH 142) Public Health Inspection 1—Provides the student with information on duties and responsibilities in government organizations. Includes a detailed study of related environmental and health legislation as well as the division of control and authority at the federal,

provincial and local levels. Control techniques and procedures used by field practitioners are stressed for a variety of common situations.

ENVH 1143 (ENVH 143) Environmental Health and Engineering 1—Covers a number of environmental health topics including emergency measures, recreational sanitation, indoor air, housing, swimming pools, plumbing, investigation of communicable diseases and other topical subjects.

ENVH 2231 (ENVH 231) Food Hygiene 2— See ENVH 1141. Prerequisite: ENVH 1141.

ENVH 2232 (ENVH 232) Public Health Inspection 2— See ENVH 1142. Prerequisite: ENVH 1142.

ENVH 2266 (ENVH 266) Epidemiology and Biostatistics—This course enables the student to apply epidemiological principles to assess the distribution and causes of disease in the population, and to use biostatistical methods to evaluate data critically and study conclusions. Prerequisite: MATH 1821.

ENVH 2275 (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 characteristic diposal methods of domestic solid wastes.

ENVH 2453 (ENVH 453) Environmental Health and Engineering 2— See ENVH 1143. Prerequisite: ENVH 1143.

ENVH 3331 (ENVH 331) Food Hygiene 3— See ENVH 1141. Prerequisite: ENVH 2231.

3332 (ENVH 332) Public Health Inspection 3—See ENVH 1142. Prerequisite: ENVH 2232.

ENVH 3337 (ENVH 337) Public Health Administration 1—This survey course examines the principles of organizational behavior, organization and design. Theoretical aspects of public health administration will be examined, showing administrative philosophies from the classical school of administration to the present day. These administrative concepts will be applied to the functioning of government agencies and health departments. Particular reference will be made to local government organizations. ENVH 4437 examines in greater depth the fields of labor relations, budgeting and management information systems.

ENVH 3350 (ENVH 350) Industrial Hygiene 1: Noise—Reviews noise topics relevant to occupational and community noise assessment and control. Through lectures and laboratory exercises the student is introduced to the basic theory of sound, noise measurement and analysis, equipment calibration, selection of personal protective equipment and the assessment of hearing loss. At the end of this course the student will be able to recommend simple sound control measures such as the use of barriers and absorbent materials. Prerequisite: MATH 1821, PHYS 1282.

ENVH 3358 (ENVH 358) Environmental Health Relations—Examines the interrelationships and interactions within a health agency and between various government departments and agencies. Additionally the forces which underlie the social behavior of individuals and groups will be examined. Interpersonal relations will be examined through the practical application of public health skills and the interaction of personnel in the environmental health field. The principles of dealing with situations such as political pressures and the media will be examined, with emphasis on problems specific to public health.

ENVH 3379 (ENVH 379) Technical Research Methods 1—Provides for the development of 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.

ENVH 4437 (ENVH 437) Public Health Administration 2— See ENVH 3337. Prerequisite: ENVH 3337.

ENVH 4456 (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 public health officials are likely to come in contact with in the course of their duties. Special attention will be given to the body of legislation designed for the protection and promotion of individual and community health. Court procedure and evidence-giving are examined in depth.

ENVH 4459 (ENVH 459) Technical Research Methods and Toxicology—See ENVH 3379. Prerequisite: ENVH 3379.

ENVH 4470 (ENVH 470) Industrial Hygiene and Toxicology—A basic survey course in occupational health. The student is introduced to common chemical, physical and biological stressors. Through lectures and laboratory exercises the student will be able to recognize common occupational health hazards, demonstrate the use of appropriate environmental sampling equipment and recommend control measures to alleviate potential health hazards. Prerequisite: MATH 1821, PHYS 1282.

ENVH 4471 (ENVH 471) Food Hygiene 4— See ENVH 141. Prerequisite: ENVH 3331.

MATH 1821 (MATH 182) Basic Technical Math for Environmental Health -Systems of measurement and mensuration. Linear systems and conics. Functions and graphs including power, algebraic, exponential and logarithmic, on arithmetic and logarithmic grids. Exponential growth and decay applications are stressed.

PHYS 1282 (PHYS 212) Physics: Environmental Health—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 measurement, data analysis and experimental techniques, while confirming and expanding the lecture concepts.
Prerequisite/Corequisite: MATH 1821.

Faculty and Staff

G. Eisler, M.A.Sc., M.B.A., P.Eng., Dean
L. Woolsey, B.Sc., C.P.H.I.(C), R.P.H.I., Program Head
E.J. Borsky, Dipl.T.
T. Getty, B.A.A. (Env. Health), C.P.H.I.(C)
B. Price, C.P.H.I.(C),
C.L. Young, M.Ed., C.Tech., C.P.H.I.(C), R.P.H.I.

MEDICAL LABORATORY TECHNOLOGY

Diploma Program

The Medical Laboratory Technologist
The medical laboratory technologist, as a member of the Health Care Team, performs 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, treatment and prevention 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. Medical Laboratory Technology is a field suited to both men and women.

Employment Opportunities
Hospital, private medical and public health laboratories, Red Cross transfusion services, clinical research laboratories and commercial supply companies are all areas where graduates of Medical Laboratory Technology can expect to find employment. Medical Laboratory Technology is a highly regarded career which offers good financial rewards. Beginning salaries for entry level positions are approximately $34,000 /annum. Technologists in senior management positions earn about $60,000 /annum.

Transfer Credit/Degree Completion
Degree transfer into the Bachelor of Medical Laboratory Science program at the University of British Columbia is possible on completion of the Diploma Program and certification with the Canadian Society of Laboratory Technologists.

The Program
The current BCIT program is a two-year Diploma program consisting of nine months 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) affiliated with the program. This program may begin on September 6th, 1994 with the academic year concluding at the end of May 1995. The clinical training year will begin in June 1995 and end in May 1996.

A new three-year MLT Diploma program has been proposed for September 1994 pending funding approval. This program will consist of 2 school years (9 months each) of academic studies at the Institute followed by a 12-month clinical training period in one of the clinical facilities (hospital or private lab) affiliated with the program. The entry prerequisites for the three-year program will be Grade 12 instead of the first-year university/college prerequisites required for the present two-year program. This new program may begin on September 6, 1994.

If the new program is approved, there is a possibility that for one year only both the present program commencing in September and the first year of the proposed new program commencing in September will be offered. For more information, please contact the Program Head, Karen Nicolson, at 432-8831 after January 1, 1994.
After successful completion of the MLT training program, the student is eligible to write the Certification Examinations of the Canadian Society of Laboratory Technologists (CSLT) which leads to the qualification of Registered Technologist (RT), the nationally recognized qualification for employment in a medical laboratory.

Accreditation
The MLT program (BCIT and affiliated clinical facilities) is accredited by the Conjoint Committee of the Canadian Medical Association and the Canadian Society of Laboratory Technologists.

Program Length
Two years full-time beginning in September each year. The program starts September 6, 1994.

Total Fees (subject to change—does not include book or supply costs)
$3,965.30 for the 2-year program (1993/94).

Affiliated Clinical Training Facilities
There are several clinical training laboratories affiliated with the MLT program.

Prerequisites
A. For the present two-year program:
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 6 credits at the English 100 level
- Mathematics UBC 6 credits at the Math 100 level

*No specific Mathematics courses are recommended. However, a total of 6 UBC credits at the Math 100 level (or its equivalent) are required. Statistics courses are recommended. These prerequisites should have been completed during the past 5 years. If longer than 5 years has elapsed, individual assessment will be required.

B. For the proposed three-year program:
High school Graduation with Biology 12, Chemistry 12, English 12, Mathematics 12, and Physics 11, all with a minimum of C+ or better. Prerequisites should have been completed within the past 5 years. If longer than 5 years has elapsed, individual assessment will be required.

Other Admission Requirements and Selection Process
Students are expected to be competent in written and oral English. Applicants should possess a caring and professional attitude, meticulous work habits, logical thinking, good manual dexterity, the ability to work quickly and accurately under pressure and to make decisions which directly affect the diagnosis and treatment of disease. Applicants should be aware that this program is physically demanding and requires students to stand for long periods of time.

Students should have fine motor skills and clear skin (open lesions may prohibit participation due to potential risk to students and patients) and must be able to clearly differentiate colors. Final acceptance to the program will be based on the results of a personal interview with a team composed of BCIT and clinical teaching staff and a short written exam. Prior to the interview, applicants will be required to attend an orientation session at BCIT and complete a tour of a hospital laboratory (details will be provided upon receipt of an application).

Students must complete an immunization program. A hepatitis vaccine is strongly recommended for students accepted into the program and is available at the Institute free of charge.

Applicants lacking the required prerequisites but who have graduated from a Medical Laboratory Science program and have relevant work experience will be considered for admission to the Medical Laboratory program.

Entry into Second (Clinical) Year of the MLT Program
MLT students may not continue into the second level (clinical year) of the MLT program unless they have obtained a passing grade in all of the MLT level one program courses.

Course of Studies

Year 1
Level 1 (15 weeks including exam week)

			Credits
BHSC	1104	Anatomy and Physiology	2.5
BHSC	1121	Immunology	3.5
MLAB	1103	Clinical Chemistry	9.5
MLAB	1104	Clinical Microbiology	9.0
MLAB	1105	Hematology	7.0
MLAB	1109	Histotechnology	9.0

MLT students may not continue into the second level (clinical year) of the MLT program unless they have obtained a passing grade in all of the MLT level one program courses.

Level 2 (20 weeks including exam week, excluding Spring Break)

		Credits
MLAB 1200	MLT Clinical Orientation	2.5
MLAB 1208	Immunohematology	10.5
MLAB 2103	Clinical Chemistry	9.5
MLAB 2104	Clinical Microbiology	11.5
MLAB 2105	Hematology	10.5

Year 2

Clinical training in an affiliated clinical facility in the Vancouver area (Lower Mainland), or Vancouver Island.

Level 3 (28 weeks)

MLAB 3100	Clinical Training	60.0

Level 4 (20 weeks)

MLAB 4100	Clinical Training	60.0

Levels 3 and 4 total 49 weeks of clinical training. The addition of 2 weeks of vacation and one week didactic studies make the complete second year 52 weeks in length.

Course Descriptions

BHSC 1104 (BHSC 104) Anatomy and Physiology—A systematic approach to the study of human anatomy and physiology for MLT students. The course includes basic cytology and an introduction to the skeletal, muscular, nervous, circulatory, respiratory, digestive, urinary and reproductive systems.

BHSC 1121 (BHSC 121) Immunology—A basic course designed to give the MLT 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 1103 (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 1104 (MLAB 104) Clinical Microbiology—This course 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 perform and interpret clinical microbiology tests and procedures correctly.

MLAB 1105 (MLAB 105) Hematology—This course is designed to provide the student with a detailed study of the production and function of blood cells, blood diseases and blood coagulation. Emphasis is placed on the theory and practical application of hematological tests and instrumentation necessary to interpret the resulting data in a clinical situation. Microscopy is also covered in this course.

MLAB 1109 (MLAB 109) 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, and to prepare students to work in the histopathology laboratory.

MLAB 1200 (MLAB 200) MLT Clinical Orientation—The topics discussed in this course will include professionalism, ethics, career prospects available to graduates from this program, laboratory information flow, the fundamentals of laboratory management and organization. Through a short series of case study seminars, the interrelationship between the five major MLT subject areas will be emphasized.

MLAB 1208 (MLAB 208) 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 2103 (MLAB 203) Clinical Chemistry—See MLAB 1103.

MLAB 2104 (MLAB 204) Clinical Microbiology—See MLAB 1104.

MLAB 2105 (MLAB 205) Hematology—See MLAB 1105.

MLAB 3100 (MLAB 300) Clinical Training—Clinical training requires full-time attendance in an affiliated laboratory. The purpose is to further develop the skills necessary for students to function safely and competently in a medical laboratory.

MLAB 4100 (MLAB 400) Clinical Training—See MLAB 3100.

Faculty and Instructors

Verna Magee Shepherd, M.Sc., CHE, Associate Dean
Karen E. Nicolson, B.Sc., A.R.T. (Clin. Micro.), Program Head
Wendy W. Basford, R.T.
Paul Bradbury, F.I.M.L.S., A.R.T. (Hist).
Frank L. Curtis, F.I.M.L.S., A.R.T. (Immunohem.)
Pat Johnston, A.R.T. (Hematol.)
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Technical Staff

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Heather A. Pedlar, R.T.
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Judy Steele
Vivian Tang, R.T.

MEDICAL RADIOGRAPHY TECHNOLOGY

Diploma Program

The medical radiographer is a technologist who works as part of the 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) in the hospital radiology department, at the patient's bedside or in the operating room or Emergency Department. 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. Students can expect to participate as patients to practice positioning techniques. The final 12-month clinical training must be completed at one of the participating hospitals (five in the Lower Mainland; three in the Interior; two 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 10 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 35 technologists. Most x-ray technologists work a 37.5 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. Entry level salaries begin at $34,000 /annum to $54,000 /annum for senior levels.

Accreditation

The program is accredited by the Canadian Medical Association—Conjoint Accreditation Services.

Transfer Credit/Degree Completion

BCIT offers an Advanced Diploma in Medical Imaging. Simon Fraser University grants 57 credits towards a Bachelor of Science degree to graduates of this program.

Program Length

Two and one half years full-time beginning in January each year. This includes a three-month break (June-August) after the first level.

Total Fees (subject to change—does not include book or supply costs)

$3,965.30 for the 2.5 year program (1993/94).

Prerequisites

High school graduation with Math 12, Physics 11 and 12, Biology 11 and 12 and English 12, all with a minimum of C+, are the required subject prerequisites. These prerequisites must have been completed during the past 5 years. If longer than 5 years has elapsed, upgrading in the required subjects will be necessary.

Also required are basic typing skills, an introductory computer course, and a minimum of 40 hours of volunteer work in a hospital such as candy striping and Basic Life Support (Level C).

Applicants must have a strong sense of responsibility, a caring nature, an interest in the well-being of others, particularly the sick and injured, excellent interpersonal skills, strong problem-solving skills and the ability to function as part of a team. Applicants should be aware that the profession is both physically and mentally demanding and therefore requires individuals who cope well in a stressful environment.

Applicants must also complete an immunization program as well as a medical examination by a qualified physician. A pre-admission interview with the program head of Medical Radiography is conducted to assess the applicant's suitability for this field. Applicants must be competent in written and oral English. The applicant's suitability for the program is also assessed by hospital staff and management, following a 3-day clinical orientation in a radiology department.

COURSE OF STUDIES

YEAR ONE

Level 1		January to April (17 weeks)	Credits
BHSC	1113	Anatomy and Physiology 1	2.5
BHSC	1141	Human Behavior 1	1.0
MRAD	1100	Clinical Education 1	17.0
MRAD	1101	Radiographic Procedures 1	5.5
MRAD	1102	Medical Imaging 1	4.5
MRAD	1103	Radiographic Technique and Evaluation 1	2.5
MRAD	1104	Radiographic Anatomy and Physiology 1	3.5
NURS	1180	Patient Care	2.5
PHYS	1272	Physics for Medical Radiography	5.5

Students are in hospitals for clinical experience for one day per week for 17 weeks and full-time for 4 weeks during the month of May.

Level 2		September to December (15 wks)	Credits
BHSC	2213	Anatomy and Physiology	2.0
MRAD	2200	Clinical Education 2	11.5
MRAD	2201	Radiographic Procedures 2	5.0
MRAD	2203	Radiographic Technique and Evaluation 2	2.5
MRAD	2204	Radiographic Anatomy and Physiology 2	2.0
MRAD	2205	Case Studies 1	1.5
MRAD	2207	Pathology 1	2.0
MRAD	2212	Medical Imaging 2	1.5
NURS	2180	Patient Care 2	3.0
PHYS	2272	Physics: Medical Radiography	3.0

Level 2 is 15 weeks in length, including exam week. During the months of October, November and December, students alternate every two weeks between BCIT and the clinical area (scheduled for 35 hours-per-week). The hours-per-week listed above are the hours averaged over the length of the course. The actual hours-per-week in a certain course will vary depending on the month.

YEAR TWO

Level 3	January to April (16 weeks)	Credits
BHSC 2241	Human Behavior	1.5
COMM 1372	Communication for Medical Radiographers	2.0
MRAD 3300	Clinical Education 3	16.0
MRAD 3301	Radiographic Procedures 3	2.5
MRAD 3303	Radiographic Technique and Evaluation 3	1.5
MRAD 3304	Radiographic Anatomy and Physiology 3	1.5
MRAD 3305	Case Studies 2	1.5
MRAD 3307	Pathology 2	2.0
MRAD 3308	Radiation Biology and Protection	1.5
MRAD 3309	Special Procedures	1.5
MRAD 3312	Medical Imaging 3	2.0

Level 3 is 16 weeks in length, including exam week. Students are in the clinical area for alternate two-week periods at 35 hours-per-week (averaging out at 17.5 hours-per-week for the term). Actual lecture and lab hours-per-week, for the weeks students are on campus, are therefore scheduled at twice the hours listed above.

Level 4	May to December (33 weeks)	Credits
MRAD 4400	Clinical Education	66.0

Level 5	January to April (17 weeks)	Credits
MRAD 5500	Clinical Education	34.0

Levels 4 and 5 total either 50 or 49 weeks in length depending on number of weeks of vacation. Length of vacation and time of year it is taken is dependent upon clinical training facility (i.e. hospital).

* All courses have a 60% pass mark.

Course Descriptions

BHSC 1113/2213 (BHSC 113/213) Anatomy and Physiology— A systematic study of the basics of human anatomy and physiology which prepares the student for MRAD 1104/2204/3304, Radiographic Anatomy and Physiology. Included are basic physiological chemistry, cytology and histology.

BHSC 1141 (BHSC 141) Human Behavior— The first half of the course deals with organizational behavior from the perspective of the technologist and his/her immediate supervisor. The second half provides the student with social and psychological concepts related to processes.

COMM 1372 (HCOM 102) Communication for Medical Radiographers—Introduces students to the communication needs of health care workers communicating with supervisors and patients. The course includes organizing and explaining information, objective and subjective descriptions, short reports, action memos, oral briefings and meetings. All assignments are based on radiography case studies.

MRAD 1100 (MRAD 100) Clinical Experience—Students are orientated to the clinical area and gain experience in basic radiographic positioning and techniques relating to the chest, abdomen, and upper and lower extremities as well as preparation of contrast media.

MRAD 1101 (MRAD 101) Radiographic Procedures—An introduction and orientation to the field of radiography will be presented together with a brief introduction to x-radiation protection practices. Radiographic procedures relating to the upper and lower extremities, chest, pelvic girdle, spine, and abdomen will be covered.

MRAD 1102 (MRAD 102) Medical Imaging 1—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 1103/2203/3303 (MRAD 103/203/303) Radiographic Technique and Evaluation—The student will review patient radiographs, with instruction being given regarding film evaluation, identification of pertinent structures as well as the technical considerations for each area. The student will develop technique charts, become aware of all factors affecting radiographic quality, and develop the necessary skill to adjust technical factors to produce optimum quality radiographs.

MRAD 1104/2204/3304 (MRAD 104/204/304) Radiographic Anatomy and Physiology—In this course, a detailed study is made of the human skeleton. 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 1113/2213.

MRAD 2200/3300 (MRAD 200/300) Clinical Experience—Students will gain practical experience in the following areas: upper and lower extremity (trauma patient), non-ambulatory chest with I.V. or drainage, non-traumatic vertebra, routine fluoroscopy and routine I.V.P.'s.

MRAD 2201 (MRAD 201) Radiographic Procedures 2—The radiographic procedures related to the digestive, urinary and biliary systems and the thoracic cage are covered. Three 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. Prerequisite: MRAD 1101.

MRAD 2205/3305 (MRAD 205/305) Case Studies—Designed to provide the bridge between classroom theory and clinical work. A case study is presented and students discuss all aspects of the case including the anatomy and physiology, positioning, radiation protection, imaging and equipment issues, technique and patient care. Students have the opportunity to develop analytical and planning skills in a laboratory setting.

MRAD 2207 (MRAD 207) Pathology 1—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 2212 (MRAD 212) Medical Imaging 2—Continuing from MRAD 1102, this course includes details of x-ray circuits, mobile units, and rapid serial film units. Quality assurance includes: processor monitoring, various tests on x-ray units and imaging equipment. Laboratory work related to these subjects is included.

MRAD 3301 (MRAD 301) Radiographic Procedures 3—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. Prerequisite: MRAD 201.

MRAD 3307 (MRAD 307) Pathology 2—This course, which follows MRAD 2207, 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 3308 (MRAD 308) Radiation Biology and Protection—The first part of this course deals with the fundamental concepts of radiobiology through a discussion of radiation interaction with tissue, radiosensitivity; radiation effects at doses greater than, and within, the diagnostic range, effects of radiation on the embryo and fetus, as well as low-level radiation effects. In the second part of the course, radiation

protection concepts are introduced. First, the principles of radiation protection and the establishment of dose limits are described. This is followed by a discussion of various methods used to minimize radiation doses to both patients and personnel. Finally, the course concludes with equipment specifications and shielding guides for diagnostic x-ray installations.

MRAD 3309 (MRAD 309) Specialized Procedures—Includes discussion of the specialized radiographic procedures utilized to demonstrate the circulatory and central nervous systems as well as the digestive, biliary and genito-urinary tracts. Also included is a brief discussion of CT Scanning, mammography, trauma and interventional radiology.

MRAD 3312 (MRAD 312) Medical Imaging 3—Continues from MRAD 212 with study of special tubes, artifacts, image presentation, and rollfilm processing. Advanced imaging includes computer basics, computerized tomography (CT), digital imaging, and magnetic resonance imaging (MRI). Allied imaging includes nuclear medicine and diagnostic sonography.

MRAD 4400/5500 (MRAD 400/500) Clinical Experience —The student gains practical experience in the following areas: skeletal radiography; trauma vertebra; fluoroscopy examinations; horizontal beam procedures; injectable contrast exams and mobile/operating room exams.

NURS 1180 (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.

NURS 2180 (GNNU 280) Patient Care—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: NURS1180.

PHYS 1272/2272 (PHYS 110/210) Physics: Medical Radiography 1 & 2—This is an introductory level course based on the topics listed in the CAMRT syllabus of studies. The course emphasizes applied physics in Medical Radiography from a conceptual view. Topics include: structure of matter, static electricity, DC circuits (Ohm's law), magnetism, electromagnetic induction, AC circuits, transformers, rectification, electromagnetic waves, X-ray production, X-ray attenuation, heat transfer, and X-ray tube design.

* For specific program information, please contact the Program Head at 432-8743.

Faculty and Staff

Verna Magee Shepherd, M.Sc., CHE, *Associate Dean*
Ann McMillen, R.T.R., Dipl.Hlth.Care Mgt., M.Ed., Program Head
Mary Filippelli, R.T.R.
Shirley Hundvik, R.T., M. Ed.
Dori Kaplun, A.C.R.
Rita McLaughlin, A.C.R.
Gisela Paches, R.T.R.
Euclid Seeram, R.T.R., B.Sc., M.Sc.
Roger Smith, D.C.R., R.T.R.
Iris Williamson, A.C.R., R.D.M.S.

Clinical Instructors for Medical Radiography Technology Affiliated Hospitals

Burnaby Hospital
Eleanore Nuttall, R.T.R.
B.C. Children's Hospital
Nancy Deylin, R.T.R.
Greater Victoria Hospital Society
Louise Kallhood, A.C.R.
Lions Gate Hospital
Kristin Carabetta, R.T.R.
Kelowna General Hospital
Patti Anderson, R.T.R.
Prince George Regional Hospital
Helen Domshy, R.T.R.
Royal Columbian Hospital
Henry Ross, R.T.R.
Royal Inland Hospital
Anna Yoshida, R.T.R.
St. Paul's Hospital
Joanne Peterson, R.T.R.
University Hospital, UBC Site
Lois Tanner, A.C.R.
Vancouver General Hospital
Phylis Washylyshyn, R.T.R.

NUCLEAR MEDICINE TECHNOLOGY

Diploma Program

Nuclear medicine is the application of radioactive materials to the diagnosis and management of disease in humans. It is primarily a diagnostic specialty 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 serum and other patient samples.

Nuclear medicine is responsible for a host of revolutionary, safe, non-invasive diagnostic procedures that are now available to physicians in many 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 patient 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. In B.C., beginning salaries for entry level positions are approximately $36,500 /annum.

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, the student spends alternate two-week periods at BCIT and the nuclear medicine department of a Lower Mainland hospital. 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.

Program Length

Two years full-time beginning in September each year.

Total Fees (subject to change—does not include book or supply costs)

$3,965.30 for the two year program (1993/94).

Post-graduation/ Degree Completion

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.) and work as registered nuclear medicine technologists anywhere in Canada and in many other parts of the world. Advanced Certification is available. Simon Fraser University grants two years credit towards a Bachelor of Science degree to graduates of this program.

Accreditation

The program is accredited by the Canadian Medical Association—Diagnostic Imaging in Medical Radiation Technology.

Prerequisites

High school graduation with English 12, Math 12, Chemistry 12 and Physics 11, all with a minimum C+ are the required subject prerequisites. Biology 11 is also strongly recommended. These prerequisites should have been completed during the past five years. If longer than five years has elapsed, individual assessment will be required. 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 as a health care team worker. Excellent communication and interpersonal skills are required. A pre-admission 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. A Hepatitis vaccine is strongly recommended and is available at the Institute at no cost.

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.

Program: NUCLEAR MEDICINE TECHNOLOGY

Level 1		Credits
BHSC 1106	Anatomy andPhysiology 1	4.0
BHSC 1126	Medical Microbiology and Immunology	2.0
CHEM 1116	Chemistry 1 for Nuclear Medicine Technology	4.0
MATH 1751	Basic Technical Mathematics for Nuclear Medicine	4.0
MLAB 1111	Clinical Laboratory Orientation	3.0
NMED 1020	Radiopharmaceuticals 1	4.0
NMED 1040	Introductionto NMT	3.0
PHYS 1274	Physics for Nuclear Medicine 1	6.0

Level 2		
BHSC 2206	Anatomy and Physiology 2	5.5
CHEM 2216	Chemistry 2 for Nuclear Medicine Technology	5.5
MATH 2751	Statistics for Nuclear Medicine Technology	4.0
NMED 2020	Radiopharmaceuticals 2	2.5
NMED 2030	Radioassay Procedures	2.5
NMED 2040	Applied Physiology 1	2.5
NMED 2050	Radiobiology and Protection	2.5
NURS 1181	Patient Care	4.0
PHYS 2274	Physics for Nuclear Medicine 2	10.5

Summer (12 weeks)		
NMED 2090	Clinical Experience 1	24.0

Level 3		
BHSC 3306	Pathophysiology	3.0
NMED 3010	Image Display	2.0
NMED 3040	Applied Physiology 2	10.0
NMED 3080	Clinical Experience 2	14.0
PHYS 3274	Physics for Nuclear Medicine 3	3.0

Level 4		Credits
BHSC 1439	Human Behavior	2.5
BHSC 4406	Pathophysiology	2.5
COMM 1474	Communication for NMT	2.5
NMED 4040	Applied Physiology 3	11.0
NMED 4080	Clinical Experience 3	18.5
PHYS 4274	Physics for Nuclear Medicine 4	4.0

Summer (15 weeks)		
NMED 4090	Clinical Experience 4	30.0

* All courses have a 60% pass mark.

During Levels 3 and 4 students are in the clinical area for alternate two-week periods of 35 hours per week. The hours listed for these levels are the average hours per week for the term on campus.

Course Descriptions

BHSC 1106 (BHSC 106) Anatomy and Physiology 1— 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 2206.

BHSC 1126 (BHSC 126) Medical Microbiology and Immunology—Deals with basic properties of medically important microorganisms, the communicability of infection, host-parasite relationships, methods of destruction and control of microorganisms, with particular attention to the safe preparation of radiopharmaceuticals used for injection. The course also deals with basic immunologic concepts including their related in-vitro applications.

BHSC 1439 (BHSC 439) Human Behavior—An introduction to the basics of the psychological and social environment of health care organizations, with the aim of understanding how communication affects task activities.

BHSC 2206 (BHSC 206) Anatomy and Physiology 2—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 3306/4406 (BHSC 306/406) Pathophysiology—An introduction to the principles of pathology based on a disease process approach. Systems pathology commonly investigated by nuclear medicine procedures is discussed along with some complex patterns of disease. Prerequisite: BHSC 2206.

CHEM 1116 (CHEM 116) Chemistry 1 for Nuclear Medicine Technology—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 both gravimetric and volumetric quantitative analysis.

CHEM 2216 (CHEM 216) Chemistry 2 for Nuclear Medicine Technology—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 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 1106.

COMM 1474 (HCOM 114) Communication for NMT—Introduces students to the communication needs of the nuclear medicine profession communicating with supervisors and patients. This course includes organizing and explaining information, oral and written reporting, and resume writing.

MATH 1751 (MATH 175) Basic Technical Mathematics for Nuclear Medicine -Emphasizes enhancement of calculation skills and development of problem-solving techniques. Topics include logarithms, exponential growth and decay (physical, effective and biological half-lives, transmission of shielded radiation), graphing techniques applied to RIA (log, semi-log, logit-log, cubic spline), curve stripping, an introduction to calculus.

MATH 2751 (MATH 275) Statistics for Nuclear Medicine—Offers a solid introduction to statistical data treatment and decision-making with illustrative health applications. Topics include descriptive statistics, binomial, Poisson and Normal probability models, estimation and hypothesis testing, regression and correlation in RIA. Emphasis is on learning relevant jargon and techniques in order to appraise technology journal articles and use quality control in the lab.

MLAB 1111 (MLAB 111) 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 1020 (NMED 102) Radiopharmaceuticals 1—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 radiopharmaceuticals.

NMED 1040 (NMED 104) Introduction to Nuclear Medicine Technology—An overview of the many components that comprise Nuclear Medicine Technology and its role in the health care system. Topics also include laboratory safety, blood handling and procurement, basic darkroom technique and medical terminology.

NMED 2030 (NMED 203) 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 2040 (NMED 204) Applied Physiology 1—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 2050 (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 2090 (NMED 209) Clinical Experience 1—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 competently in a nuclear medicine lab. Hands-on experience will be gained in all aspects of "in vitro" and "in vivo" procedures.

NMED 3010 (NMED 301) Image Display—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 and computer visual displays will be covered in theory and practice.

NMED 3040 (NMED 304) Applied Physiology 2—The student is instructed in all aspects of current applied physiology including criteria, methodology, instrumentation, patient problems and approach, data collection and manipulation.

NMED 3080 (NMED 305) Clinical Experience —See NMED 2090.

NMED 4040 (NMED 404) Applied Physiology 3—A continuation of NMED 3040. The student is instructed in all aspects of current applied physiology including criteria, methodology, instrumentation, patient problems and approach, data collection and manipulation.

NMED 4080 (NMED 405) Clinical Experience 3—See NMED 2090.

NMED 4090 (NMED 409) Clinical Experience 4—See NMED 2090.

NURS 1181 (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.

PHYS 1274 (PHYS 105) Physics for Nuclear Medicine 1—An introductory level course reviewing forces and energy and describing nuclear physics topics including atomic structure, X-rays, nuclear structure, nuclides, measures of radioactive decay, modes of decay and interaction of radiation with matter.

PHYS 2274 (PHYS 205) Physics for Nuclear Medicine 2—Continues the basic nuclear physics begun in PHYS 1274. Starts with a description of radiation interaction with matter and nuclear reactions. A foundation for instrumentation is made by covering static electricity, DC electricity, magnetism, and AC electricity. Instrumentation topics include a detailed study of scintillation detectors and an introduction to gamma cameras. Prerequisite: PHYS 1274.

PHYS 3274 (PHYS 305) Physics for Nuclear Medicine 3—Continues the instrumentation work begun in PHYS 2274. Consists of a detailed study of anger type gamma cameras including collimators, the camera head, addressing and uniformity, spatial resolution and image contrast, sensitivity and resolving time. Prerequisite: PHYS 2274.

PHYS 4274 (PHYS 405) Physics for Nuclear Medicine 4—Completes the instrumentation work begun in PHYS 2274 and 3274. Includes an introduction to computers, SPECT, G.M. counters, proportional counters, ionization detectors, liquid scintillation counting, semiconductor detectors, and thermoluminescent detectors. Prerequisite: PHYS 3274.

Faculty and Staff

Verna Magee Shepherd, M.Sc., CHE, Associate Dean
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Lorie Klit, R.T.N.M.
Lawrence Parisotto, B.Sc., R.T.N.M.
Kevin Hudkins, R.T.N.M., Clinical Coordinator

Clinical Instructors for Nuclear Medicine Technology Affiliated Hospitals and Clinical Sites

Burnaby Hospital
Alvena Getz, R.T.N.M.
B.C. Children's Hospital
Louise Rimanic, R.T.N.M.
Kelowna General Hospital
Robert Conzatti, R.T.N.M.
Lions Gate Hospital
Debbie Shaw, R.T.N.M.
Metro-McNair Clinical Laboratories
Eileen Beattie, R.T.N.M.
Royal Columbian Hospital
Phyllis Watson, R.T.N.M.
Royal Jubilee Hospital
Lorie Turpin, R.T.N.M.
St. Paul's Hospital
Nazma Tarmahmed, R.T.N.M.
University Hospital, UBC Site
Dara Barrett, R.T.N.M.
Vancouver General Hospital
Linda Harrison, R.T.N.M.
Victoria General Hospital
Jean Campbell, R.T.N.M.

NURSING

Diploma Program

Today's registered nurse assists people to meet their health needs in collaboration with other members of the health care team such as dietitians, occupational therapists, pharmacists, physicians, physiotherapists, respiratory therapists, 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 a high-stress profession, nursing is a rewarding career for both men and women.

Job Opportunities

Registered nurses are employed in general hospitals and community agencies. Positions for new graduates are available mainly in medical and surgical units. Salary range from entry level to senior level for Registered Nurses is $36,756 -$45,552/annum. Additional payment is received for shift work and charge positions.

The Program

The program is approved by the Registered Nurses' Association of British Columbia (RNABC). Graduates are eligible to write the national registration examinations. Graduates are prepared for employment in general hospitals or other health care agencies where comparable levels of patient care and nursing judgment are required. The program provides instruction in Nursing, Basic Health Sciences and Communications. Learning opportunities include: independent study, lectures, laboratories, tutorials, audiotaping, video taping and experience with patients and families in extended care, surgical, obstetrical, pediatric and psychiatric units.

The first year of the program is also offered at one access college: East Kootenay College. Upon successful completion of the first year, the student automatically transfers to BCIT for the second year. Graduates are awarded a joint diploma certified by both institutions. These students may be able to complete Level 5 in their home regions, dependent on such factors as available placements, preceptors, and student achievement.

Independent study is based on printed modules that contain objectives, learning activities, post-tests and reference lists. Students are expected to have completed modules 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 selfdirected, disciplined and have well-developed reading, study and organization skills. Remedial courses on these skills are available at some high schools through evening programs, as well as many post-secondary institutions such as the colleges and BCIT.

Program Length

The program is two and one third years in length and comprised of five levels of 17 weeks each. The fall term extends from mid-August to mid-December; the winter term from January to mid-May. Students are free of studies from mid-May to mid-August.

Total Fees (subject to change—does not include book or supply costs)

$4,650 for the 2.5-year program (1993/94). The Board of Governors is reviewing fee structures at this time.

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 Financial Aid and Awards in Student Services. Telephone 432-8555.

Prerequisites

Applicants must have all the admission requirements completed at least 30 days prior to registration to be eligible for a seat.

1. Academic

A. Applicants admitted into the program with High School graduation:
   a) Chemistry 11 with C+ minimum
   b) Either Chemistry 12 or Biology 12 (preferred) with C+ minimum
   c) Math 11 with C minimum
   d) English 12 with C+ minimum.

B. Applicants admitted into the program with G.E.D. or B.T.S.D. Level 4:
   a) Chemistry 11 with C+ minimum
   b) Either Chemistry 12 or Biology 12 (preferred) with C+ minimum
   c) Math 11 with C minimum
   d) English 12 equivalent.

C. English 100 is a preferred prerequisite. UBC: 6 credits at the English 100 level or equivalent.

Note: Applicants must have satisfactorily completed (C+ minimum) one of the Grade 12 required science courses or a higher level science course within the last 5 years.

2. Non-Academic

A. Health Care Experience (Work or Volunteer):
Experience with adult patients, preferably elderly persons, or with children with mental or physical disabilities. Hospital experience is preferred. Minimum of 30 hours of patient contact. Satisfactory confidential references are required. Employment/health care experience is assessed on an individual basis.

B. Employment:
For individuals with previous employment, a satisfactory confidential reference is required.

C. Immunization:
Completion of the immunization form is required before final acceptance into the program.

D. Satisfactory Health:
Satisfactory health is required for all applicants.

E. Interview:
A satisfactory interview with a member of the 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, including fluency in English.

F. First Aid:
Standard level first aid certificate (e.g. St. John's Ambulance, Canadian Red Cross Society) or equivalent is required and must be valid for the student's first year in the program.

Notes:

1. Applicants with baccalaureate degrees within 5 years will be assessed on an individual basis to determine equivalency with academic criteria.

2. C.P.R. (Level C) certificate is prerequisite to Level 4. It must be current during both Levels 4 and 5.

3. A criminal record search is required by certain agencies.

Post-graduation

Following completion of the nursing diploma program, students must write the Canadian registration examinations in order to obtain the R.N. (Registered Nurse) designation. There is a (*CNATS) fee for these examinations. Applicants for nurse registration are required to disclose previous criminal convictions and to have a criminal record search. Concerns regarding criminal records should be discussed with the R.N.A.B.C.
*(1993—CNATS fee is $215.)

Advanced Training/ Degree Completion

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.

All B.C. universities recognize diploma nursing preparation thus reducing the 4-year program. The specific time reduction depends on the degree granting institution.

BCIT and Open Learning Agency offer a joint degree—Bachelor of Health Sciences, Nursing, following completion of an Advanced Diploma Program.

Note: Nursing is currently under curriculum review. There may be adjustments to the courses described below.

Program: NURSING

Level 1			Credits
BHSC	1105	Anatomy and Physiology	3.5
BHSC	1118	Personal Fitness Management	2.0
BHSC	1140	Human Development 1	3.5
NURS	1100	Nursing 1: Theory/Clinical	25.0
		or	
NURS	1101	Nursing 1: Theory	10.0
		and	
NURS	1102	Nursing 1: Clinical	15.0
NURS	1110	Becoming a Master Student	2.5

Level 2			
BHSC	1239	Sociology	1.5
BHSC	2205	Physiology	3.5
BHSC	2227	Microbiology	2.0
BHSC	2240	Human Development 2	1.5
NURS	2100	Nursing 2: Theory/Clinical	24.0
		or	
NURS	2101	Nursing 2: Theory	9.0
		and	
NURS	2102	Nursing 2: Clinical	15.0

Level 3			Credits
BHSC	3328	Immunology	2.0
COMM	1376	Writing for Nurses	3.5
NURS	3100	Nursing 3: Theory/Clinical	26.0
		or	
NURS	3101	Nursing 3: Theory	9.0
		and	
NURS	3102	Nursing 3: Clinical	17.0

Level 4			
NURS	4100	Nursing 4: Theory/Clinical	25.0
		or	
NURS	4101	Nursing 4: Theory	8.0
		and	
NURS	4102	Nursing 4: Clinical	17.0

Level 5			
NURS	4500	Nursing 5: Theory/Clinical	42.0

Course Descriptions

BHSC 1105 (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 1118 (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 1140 (BHSC 140) Human Development 1 —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 1239 (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 2205 (BHSC 205) Physiology—A study of physiological regulation and control based on the fundamentals established in BHSC 1105. Prerequisite: BHSC 1105.

BHSC 2227 (BHSC 227) 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 1105.

BHSC 2240 (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 1140.

BHSC 3328 (BHSC 328) 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 1105, 2227.

COMM 1376 (HCOM 107) Writing for 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.

NURS 1100 (GNNU 100) Nursing 1: Theory/Clinical—This course, offered in the first level of the Nursing Diploma Program, is an overview of the nursing curriculum. The student is introduced to basic concepts of the nursing model, nursing process, nursing skills, and professional behavior. Emphasis is placed on the normal requirements for need satisfaction, the stressors associated with lifestyle patterns, and assisting the individual by supporting appropriate responses. The common response of general adaptation syndrome is introduced. Principles of pharmacology are discussed. 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. Students are expected to provide care to 2 individuals.

NURS 1101 (GNNU 101) Nursing 1: Theory—This course is offered in the first term of the Nursing Program. Students are admitted with permission of the Program Head in consultation with the term Instructor and Chief Instructor. The course presents an overview of the nursing curriculum. Basic concepts of the nursing model, nursing process, nursing skills, and professional behavior are introduced. Emphasis is placed on normal requirements for need satisfaction, the stressors associated with lifestyle patterns, and assisting the individual by supporting appropriate responses. The common response of general adaptation syndrome is introduced. Principles of pharmacology are discussed. Concurrent theory and laboratory focus on the nursing measures required to assist individuals to satisfy needs.

NURS 1102 (GNNU 102) Nursing 1: Clinical—This course is offered in the first level of the Nursing Program. It is a clinical practice course which focuses on the nursing measures required to assist individuals to satisfy needs. Knowledge and skills learned in NURS 1101 are applied. Clinical experience is provided with adults on medical and extended care units and in community agencies. Students are expected to provide care to individuals. Prerequisite: NURS 1101.

NURS 1110 (GNNU 110) Becoming a Master Student—This is a nursing student success course designed to help students learn more efficiently, assume control of their learning and maximize their health during the learning process. The course will focus on increasing life skills, academic skills and awareness of the resources available for assistance.

NURS 2100 (GNNU 200) Nursing 2: Theory/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. Students are expected to provide care to 2-3 individuals. Community visits will be integrated throughout the course. Prerequisite: NURS 1100, BHSC 1105, 1140.

NURS 2101 (GNNU 201) Nursing 2: Theory—This course is offered in the second level of the Nursing Program. Students are admitted with permission of the Program Head in consultation with the term Instructor and Chief Instructor. The course focuses on stressors associated with selected stages and tasks of growth and development and selected unanticipated events. Responses to these stressors may be appropriate or inappropriate. The common responses of pain, anxiety, altered self-image and general adaptation syndrome are studied. Theory content about the surgical patient is provided. Selected pharmacology content is included as part of therapeutic measures for specific stressors/responses. Concurrent theory and laboratory focus on the nursing measures required to assist individuals to satisfy needs. Prerequisite: NURS 1100 or 1101 and 1102, BHSC 1105, 1140.

NURS 2102 (GNNU 202) Nursing 2: Clinical—This course is offered in the second level of the Nursing Program. It is a clinical practice course which assists individuals to satisfy needs. Knowledge and skills from NURS 2101 are applied. Clinical experience is provided in hospital settings with adults on general surgical units. Students are expected to provide care to 2-3 individuals. Community visits are made during the course. Prerequisite: NURS 2101.

NURS 3100 (GNNU 300) Nursing 3: Theory/Clinical—The study of individuals of all ages whose responses to stressors may be appropriate or inappropriate. Emphasis is placed on the stressors associated with both selected unanticipated events and with the selected growth, 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-centred units and pediatric units. Students are expected to provide care to 2-3 pediatric patients and a maximum of 4 maternity patients and their neonates. Community visits are integrated throughout the course. Prerequisite: NURS 2100, BHSC 2205, 2227, 2240.

NURS 3101 (GNNU 301) Nursing 3: Theory—This course is offered in the third term of the Nursing Program. Students are admitted with permission of the Program Head in consultation with the term Instructor and Chief Instructor. It focuses on stressors associated with the stages and tasks of growth and development related to childhood and childbearing and selected unanticipated events. Responses to these stressors may be appropriate or inappropriate. The common response of general adaptation syndrome (exhaustion phase) is studied. Altered physiology and pharmacology theory are integrated within the course. Concurrent theory and laboratory focus on nursing measures required to assist individuals to satisfy needs of growth and development related to childhood and childbearing and selected unanticipated events. Prerequisite: NURS 2100 or 2101 and 2102, BHSC 2205, 2227, 2240.

NURS 3102 (GNNU 302) Nursing 3: Clinical—This course is offered in the third level of the Nursing Program. It focuses on the nursing measures required to assist individuals to satisfy needs. Knowledge and

skills from NURS 3101 are applied. Clinical experience is provided on family-centred maternity, general pediatric units and in community agencies. Students are expected to provide care to 2-3 pediatric patients and a maximum of 4 maternity patients and their neonates. Some experience is provided in the labour and delivery unit. Prerequisite: NURS 3101.

NURS 4100 (GNNU 400) Nursing 4: Theory/Clinical—This course focuses on stressors associated with selected stages and tasks of growth and development, selected unanticipated events, and multiple unanticipated events. Response to these stressors may be appropriate or inappropriate. The common response of dying is studied. Altered physiology and pharmacology are integrated within the course. Concurrent theory, laboratory and clinical practice focus on the nursing measures required to assist individuals to satisfy needs. Clinical experience is provided with adults on acute psychiatric, medical, and surgical units. Students are expected to provide care to 2-4 individuals. A community visit related to substance abuse is included in the course. Prerequisite: NURS 3100, CPR (Level C), BHSC 3328.

NURS 4101 (GNNU 401) Nursing 4: Theory—This course is offered in the fourth term of the Nursing Program. Students are admitted with permission of the Program Head in consultation with the term Instructor and Chief Instructor. It focuses on stressors associated with selected stages and tasks of growth and development, selected unanticipated events, and multiple unanticipated events. Responses to these stressors may be appropriate or inappropriate. The common response of dying is studied. Altered physiology and pharmacology are integrated within the course. Concurrent theory and laboratory focus on the nursing measures required to assist individuals to satisfy needs. Prerequisite: NURS 3100 or 3101 and 3102, BHSC 3328, CPR—Course C (Current and valid).

NURS 4102 (GNNU 402) Nursing 4: Clinical—This course is offered in the fourth level of the Nursing Program. It is a clinical practice course which focuses on nursing measures required to assist individuals to satisfy needs. Knowledge and skills from NURS 4101 are applied. Clinical experience is provided with adults on acute psychiatric, medical, and surgical units. Students are expected to provide care to 2-4 individuals. A community visit related to substance abuse is included in the course. Prerequisite: NURS 4101.

NURS 4500 (GNNU 450) Nursing 5: Theory/Clinical—This course focuses on the integration of previously presented concepts related to stressors, responses and nursing measures. Emphasis is placed on organization and leadership skills and the responsibilities of the graduate nurse. Clinical experience is provided with adults on medical and surgical units. Working with a preceptor, students are expected to provide care to 4-6 patients or to assume responsibility for care given to patients by a nursing team. Prerequisite: NURS 4100, BHSC 1118, COMM 1376, CPR (Level C).

CREDIT COURSES FOR 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. Nursing students are responsible for applying to the Institute in which they are enrolled for credit for these courses.

For information, write to Health Part-time Studies, British Columbia Institute of Technology, 3700 Willingdon Avenue, Burnaby, B.C. V5G 3H2 or call 439-4100. These courses are offered in Fall, Winter and Spring Terms.

Faculty and Staff

M. Bernadet Ratsoy, B.Sc.N., M.Sc., R.N., Associate Dean
Ms. L. Appleton, R.N., B.Sc.N., M.Sc.N.
Ms. L. Brazier, R.N., B.Sc.N., M.Sc.N., Program Head
Mrs. L. Barratt, B.A., R.N., M.A., Diploma Psychiatric Nursing
Mrs. D.M. Belyk, B.Sc.N., R.N.
Mrs. E. Carr, B.Sc.N., R.N.
Ms. C. de-Botte, R.N.
Ms. K. Doyle, B.N., R.N., Diploma Counselling Psychology M.A.
Mrs. K. Bodell, B.Sc. N.(Hons.), R.N.
Ms. J. Del Vecchio, Lab. Assistant
Ms. P. Farrell, R.N., B.Sc.N.
Mrs. L. Field, R.N., B.Sc.N., M.A. (Education)
Ms. E.M. Fraser, B.Sc.N., R.N., M.B.A.
Mrs. S. Grasset, B.Sc., Ph.N., R.N.
Mrs. A. Houseman, R.N., B.Sc.N., M.Ed.
Mrs. A. Kenney-Lee, B.N., M.Ed., R.N.
Mrs. M. LaBelle, B.N., R.N., Diploma P.H.
Ms. B.A Lawes, B.Sc.N., R.N., M.Ed.
Mrs. C. McConechy, R.N., B.S.N.
Mrs. L. Milligan, R.N., B. Sc.N., M.Ed.
Mrs. K. Negoro, Diploma Nrsg. Ed., R.N.
Mrs. F. Nordstrand, R.N., Psychomotor Lab Coordinator
Mrs. A.L. Novada, B.Sc.N., Diploma T.S., R.N.
Mrs. K. Quee, B.Sc.N., R.N.
Mrs. C. Segaric, R.N., B.Sc.N.
Mrs. A. Taylor, M.A., B.Sc.N., R.N.
Mrs. D. Taylor, B.Sc.N., R.N.
Mrs. J. Uren, R.N., B.Sc.N., M.A. (Education)
Mrs. J. Verner, B.Sc.N., R.N.
Miss J. Walker, R.N., B.S.N.
Mrs. M. Walmsley, M.Ed., B.Sc.N., R.N.
Mrs. M.W. Whitehead, Ph.D., M.A (Educ.), B.Sc.N., R.N. Diploma Obs.
Ms. P.V. Zabawski, B.Sc.N., R.N.
Mrs. D. Zimka, B.Sc.N., R.N.

OCCUPATIONAL HEALTH AND SAFETY

Diploma Program

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; improve productivity by implementing loss control programs in consultation with company and labour officials; identify health and safety hazards in the work environment and advise corrective action. The occupational health and safety officer has a major role in the development and conduct of safety training programs for workers, accident investigation and prevention.

To achieve these career objectives, applicants are expected to be mature, objective persons who possess the ability to communicate decisions and goals in a tactful and professional manner.

Job Opportunities

Career openings are found throughout industry and in 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 solutions and methods of improving the workplace environment.

Program Length

Two years full-time beginning in September each year.

Total Fees (subject to change—does not include book or supply costs)

$3,965.30 for the two-year program (1993/94).

Prerequisites

High school graduation with English 12, Math 12, Chemistry 11 and Physics 11. Candidates will be interviewed. Preference will be given to applicants who have completed the prerequisites within 5 years of applying.

Program: OCCUPATIONAL HEALTH AND SAFETY

			Credits
Level 1			
BUSA	1610	Microcomputer Software 1	3.0
CHEM	1115	Chemistry 1 for OCHS	6.0
COMM	1188	Communication for OCHS Professionals	3.0
MATH	1881	Basic Mathematics for OCHS	4.0
OCHS	1142	OCHS Legislation	3.0
OCHS	1161	Principles of Loss Management	5.0
PHYS	1288	Applied Physics for OCHS 1	5.0
Level 2			
BUSA	2610	Software Systems	4.0
CHEM	2215	Chemistry 2 for OCHS	6.5
CHSC	1288	Engineering Concepts 1	5.5
COMM	2288	Communication for OCHS Professionals	4.0
MATH	2881	Statistics for OCHS	5.5
OCHS	1247	Security Systems	0.5
OCHS	2271	SafetyEngineering/ Technology	6.5
PHYS	2288	Applied Physics for OCHS 2	6.5
Level 3			
BLDG	1510	Drafting and Blueprint Reading	3.0
CHEM	3315	Organic Chemistry for OCHS	6.0
CHSC	2388	Engineering Concepts 2	4.0
COMM	3388	Advanced Communication for OCHS	2.0
HRMG	3220	Industrial Relations (OCHS)	3.0
OCHS	3350	Noise and Vibration	5.0
OCHS	3359	Risk Management	3.0
OPMT	1181	Ergonomics	5.0
Level 4			
BHSC	1407	Anatomy and Physiology	4.0
BLAW	3700	Introductory Law for OCHS	1.5
CHEM	4418	Industrial Chemistry for OCHS	4.0
COMM	4488	Writing Professional Audits	1.5
FMGT	1154	Accounting for Health Managers	2.0
HRMG	3060	Human Resource Management	3.5
OCHS	1436	Occupational Diseases	4.0
OCHS	1460	Fire Protection and Security	4.0
OCHS	3465	Electrical Safety	4.0
OCHS	3470	Instrumentation/ Toxicology	6.5
OCHS	4458	Safety Program Evaluation	6.5

Course Descriptions

BHSC 1407 (BHSC 407) 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.

BLAW 3700 (ADMN 484) Introductory Law for OCHS—An introduction to the Canadian legal system including its development, constitutional law, the Charter, torts, contracts and business relationships.

BLDG 1510 (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.

BUSA 1610 (ADMN 161) Microcomputer Software 1—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 spreadsheets, as well as the application of software to the field of Occupational Health and Safety.

BUSA 2610 (ADMN 261) Software Systems—See BUSA 1610.

CHEM 1115 (CHEM 115) Chemistry 1 for OCHS—An introductory course in basic inorganic chemistry. Topics include: chemical bonding, stoichiochemistry, formula writing, solution preparation, oxidation and reduction, acid-base theory, titration calculations and buffer solutions.

CHEM 2215 (CHEM 215) Chemistry 2 for OCHS—Offers an applied approach to melding established chemical principles to chemical hazards, their problems and solutions. Terminology encountered in the field allied to related principles such as acid base, oxidation-reduction, electrochemistry, stoichiometry, equilibrium, chemical bonding, simple thermodynamics, etc., are linked to potential and real chemical hazards. Laboratory exercises and field trips are designed to complement and integrate lecture material. The language of practical and theoretical applications is emphasized. Prerequisite: CHEM 1115.

CHEM 3315 (CHEM 315) Organic Chemistry for OCHS—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 2215.

CHEM 4418 (CHEM 418) Industrial Chemistry for OCHS—Provides an overview of the chemical processes used in industry, the chemicals, chemical reactions, products manufactured, waste products and pollutants produced, and the hazards to personnel. Students will make field trips to selected industries. Prerequisite: CHEM 2215.

CHSC 1288 (CHSC 288) Engineering Concepts 1—Covers test procedures for mechanical properties: nondestructive testing and failure analysis, the basic concepts of engineering materials including metals, alloys, plastics, woods, ceramics and concrete.

CHSC 2388 (CHSC 388) Engineering Concepts 2—See CHSC 1288.

COMM 1188 (HCOM 112) Communication for OCHS Professionals—This applied course introduces students to the communication needs of professionals working in the environmental and OCHS 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 OCHS topic.

COMM 2288 (HCOM 212) Communication for OCHS Professionals—This course builds on skills learned in COMM 1188 (HCOM 112) and adds incident, inspection, and investigation reports, proposals and a professional job application package. Meetings and interview skills are also covered. Students propose, design and sell a training module for an environmental health or OCHS topic. Prerequisite: COMM 1188.

COMM 3388 (HCOM 312) Advanced Communication for OCHS—This advanced project course complements the industry audit done at the end of the second year. Students write proposals, questionnaires, terms of reference, progress reports, and mini-audits focusing on one element of a full industry audit. They also present their findings to industry contacts and the OCHS program head, communication instructor and classmates. Students will work with industry representatives, BCIT staff and WCB staff while conducting interviews for their mini-audits. Prerequisite: COMM 1188, 2288.

COMM 4488 (HCOM 412) Writing Professional Audits—This advanced project course assists students with their industry audit design, layout, editing and packaging. Students present their final audit orally and in writing to their industry contacts and the OCHS program head. Students work with industry representatives, handle correspondence, conduct interviews and analyze audit data before reporting their findings in their industry audit. Prerequisite: COMM 1188, 2288, 3388.

FMGT 1154 (FMGT 416) Accounting for Health Managers—Provides students with a basic understanding of the concepts and principles of accounting. Specific topics include financial statements, the recording process, budgeting methods, zero-based budgeting and cost-volume-profit analysis.

HRMG 3060 (ADMN 435) Human Resource Management—Provides students with working knowledge of recruitment and selection performance appraisal, job evaluation and job descriptions.

HRMG 3220 (ADMN 333) Industrial Relations for OCHS—An introductory analysis of the fundamental issues and facts of labour-management relations. Special emphasis is given to collective agreement content and interpretation, bargaining and basic labour economics.

MATH 1881 (MATH 188) Basic Mathematics for OCHS—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 2881 (MATH 288) Statistics for OCHS—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. Prerequisite: MATH 1881.

OCHS 1142 (OH&S 142) Occupational Health and Safety Legislation—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.

OCHS 1161 (OH&S 161) Principles of Loss Management—Covers the history of the safety movement, the 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.

OCHS 1247 (OH&S 247) 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.

OCHS 1436 (OH&S 436) Occupational Diseases—Provides the student with an overview of occupational diseases, causes and prevalence, methods of spread and prevention. Discusses the responsibility of the worker and various professionals 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 and food supplies, to scabies and causes of silicosis, and white fingers disease.

OCHS 1460 (OH&S 464) Fire Protection and Security—Deals with fire prevention topics including the handling and storage of flammable and combustible liquids, chemical hazards, dust explosions, bleve, electrical hazards, construction features, fire chemistry, fire detection, portable extinguishers, automatic sprinkler systems, and inspection procedures.

OCHS 2271 (OH&S 271) Safety Engineering/Technology—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 metalworking machinery; cold forming of metals; hot working of metals; welding and cutting; heating and ventilation.

OCHS 3350 (OH&S 350) 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: MATH 2881, PHYS 2288.

OCHS 3359 (OH&S 359) Risk Management—A study of the principles of loss management, measurement of safety program effectiveness, risk management, basic insurance principles, transportation of dangerous goods, emergency planning and WHMIS legislation.

OCHS 3465 (OH&S 465) Electrical Safety—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 2881, PHYS 2288.

OCHS 3470 (OH&S 470) Instrumentation and Toxicology—This basic course allows the student to identify, monitor, evaluate and recommend control measures for common chemical and physical hazards in the workplace. 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, vapors, 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. Prerequisite: MATH 2881, PHYS 2288.

OCHS 4458 (OH&S 458) Safety Program Evaluation—A study of the safety audit. Students will conduct a complete safety program evaluation of an industrial firm and produce a report complete with recommendations and a plan for implementation of improvements. Prerequisite: COMM 3388.

OPMT 1181 (OPMT 181) Ergonomics—Concentrates on human factors in the scientific study of people at work, especially 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 1288 (PHYS 126) Applied Physics for OCHS 1—This course studies basic physical principles and applies them to relevant situations in the OCHS Technology. Two thirds of the course is mechanics, followed by sections on properties of matter and fluids. Topics in mechanics include kinematics, vectors, dynamics, statics, friction energy, momentum, simple machines. Properties of matter deals primarily with elasticity and ultimate strength of materials. Topics in fluids include fluid pressure, buoyancy, viscosity, fluid dynamics. Problem analysis and problem-solving techniques are stressed. The accompanying lab program emphasizes careful measurement techniques, data analysis and concise report writing. Prerequisite: Physics 11.

PHYS 2288 (PHYS 226) Applied Physics for OCHS 2—The second term of this applied physics program covers areas of thermal physics, wave motion, sound, electricity and magneticism, electromagnetic radiation. Topics in thermal physics include kinetic theory, ideal gases, specific and latent heat, thermal expansion, heat transfer, thermodynamics. Wave motion covers types of waves, standing waves and resonance. Sound topics focus on sound intensity and the dB scale. Topics in electricity and magnetism include electrostatics, DC and AC circuits, electrical safety, electromagnetism. The electromagnetic radiation section studies light waves, lasers, nuclear radiation. The problem-solving techniques and lab work are continued from the previous term. Prerequisite: PHYS 1288.

Faculty and Staff

George Eisler, M.A.Sc., M.B.A., P.Eng., Dean
Lars G. Larsson, C.R.S.P., Program Head
Val Wuorinen, C.D., Ph.D., C.R.S.P.

PROSTHETICS AND ORTHOTICS TECHNOLOGY

Diploma Program

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 orthopedic 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 fabricate the artificial limb or support personally, 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 $25,000 /annum, rising to about $40,000 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, 1994.

Program Length

Two years full-time beginning in September 1994, alternating on even number years.

Total Fees (subject to change—does not include book or supply costs)

$3,965.30 for the two-year program (1993/94).

Post-graduation

After 22 months 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

High school graduation with English 12, Math 12 and Physics 11 are course

requirements for this program. Applicants should have a good academic background (C+ average or better), 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 or clinical seminars are held, and should be prepared to purchase certain small hand tools.

*Prosthetics and Orthotics is currently under curriculum review. There may be adjustments to the courses described below.

Program: PROSTHETICS AND ORTHOTICS

Level 1			Credits
BHSC	1110	Anatomy and Physiology 1	4.0
COMM	1184	Technical Writing for Prosthetics and Orthotics	3.0
MATH	1841	Basic Math for Prosthetics and Orthotics	4.0
PHYS	1284	Physics for Prosthetics and Orthotics	4.0
PROR	1100	Prosthetics and Orthotics 1	15.0

Level 2			
BHSC	1242	Behavioral Science	3.5
BHSC	2210	Anatomy and Physiology 2	3.5
BHSC	2211	Regional Anatomy 1	2.5
CHSC	1284	Materials Workshop	2.5
COMM	2284	Technical Writing for Prosthetics and Orthotics	3.5
MATH	2841	Basic Technical Math for Prosthetics and Orthotics 2	3.0
PROR	2200	Prosthetics and Orthotics 2	15.5
PROR	2220	Biomechanics	2.5
PROR	2230	Practicum (2 weeks)	4.5

Level 3			
BHSC	3310	Pathology and Pathophysiology	3.0
BHSC	3311	Regional Anatomy 2	2.0
BMET	1382	Electrical Circuits	2.0
NURS	1183	Patient Care	2.0
PROR	3300	Prosthetics and Orthotics 3	19.0
PROR	3320	Biomechanics	2.0

Level 4			Credits
BHSC	4410	Applied Pathology	3.0
BMET	2482	Applied Electrical Fundamentals	2.0
PROR	1401	Business Practices	2.0
PROR	4330	Practicum (5 weeks)	10.0
PROR	4400	Prosthetics and Orthotics 4	20.0
PROR	4410	Patient Assessment and Care	3.0

Course Descriptions

BHSC 1110 (BHSC 110) Anatomy and Physiology 1—This course, together with BHSC 2210, 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 1242 (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 disabled to reintegrate with society. Topics include the psychology of illness, understanding stress behavior, pain management, interpersonal communication, adjustment in self-image, the disabled person in society, and relationships among health care professionals.

BHSC 2210 (BHSC 210) Anatomy and Physiology 2—A continuation of BHSC 1110. 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 1110.

BHSC 2211 (BHSC 211) Regional Anatomy 1—This is a laboratory course which, together with BHSC 3311, 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 1110.

BHSC 3310 (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. Prerequisite: BHSC 2210.

BHSC 3311 (BHSC 331) Regional Anatomy 2—This course is a continuation of BHSC 2211 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. Prerequisite: BHSC 2211.

BHSC 4410 (BHSC 410) Applied Pathology—Specific diseases frequently encountered by the orthotist/prosthetist are investigated in detail. Prerequisite: BHSC 3310.

BMET 1382 (BMET 382) Electrical Circuits—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 prostheses. Prerequisite: MATH 2841.

BMET 2482 (BMET 482) Applied Electrical Fundamentals—This course is a continuation of BMET 382. Topics include review of magnetism, inductance, motors, transformers, capacitance, electrical safety and principles of the myoelectric prosthesis. Prerequisite: BMET 1382.

CHSC 1284 (CHSC 284) Materials Workshop—Provides basic coverage of the structures, properties and applications of common engineering materials with emphasis on those used in prosthetic/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.

COMM 1184 (HCOM 111) Technical Writing for Prosthetics and Orthotics—In this course, through a series of lectures and projects, students improve their ability to express themselves clearly and appropriately to patients and their families and to health care professional groups such as government and fee-paying agencies. Topics include basic skills in writing instructions, memos, letters and reports, and effective public speaking. Library orientation and research techniques are also emphasized.

COMM 2284 (HCOM 206) Technical Writing for Prosthetics and Orthotics—A continuation of COMM 1184. Students write routine and persuasive reports and proposals. An oral presentation is also included. The emphasis is on communication applications in the prosthetics/orthotics field. Prerequisite: COMM 1184.

MATH 1841 (MATH 184) Basic Technical Math for Prosthetics—Mensuration, formula manipulation. Functions and graphs

for linear, algebraic, power, exponential, logarithmic and trigonometric applications. Oblique triangle solutions, angular motion. Linear systems with an introduction to matrix algebra.

MATH 2841 (MATH 284) Basic Technical Mathematics for Prosthetics and Orthotics 2—Descriptive statistics with measures of central tendency, dispersion, skewness and kurtosis. Probabilities, rules. Venn diagrams. Normal distribution.

NURS 1183 (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.

PHYS 1284 (PHYS 121) Physics: Prosthetics and Orthotics Technology—This general level physics course emphasizes 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.

PROR 1100 (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.

PROR 1401 (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 labour 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.

PROR 2200 (P/OT 200) Prosthetics and Orthotics 2—The area of Trans-Tibial Prosthetics is examined in detail. Design principles underlying the patellar-tendon-bearing prosthesis and 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.

PROR 2220 (P/OT 220) Biomechanics—Normal human locomotion is studied in detail. Force tolerance and mobility of the skeletal system are examined 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 1284.

PROR 2222 (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 practising prosthetic/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: PROR 1100, 2200, 2220, BHSC 2210, 2211

PROR 3300 (P/OT 301) Prosthetics and Orthotics 3—Lower Limb Prosthetics is completed with the treatment of Trans-Femoral and Total Leg Prostheses. Prerequisite: PROR 2222.

PROR 3320 (P/OT 320) Biomechanics—Force tolerance and mobility of the skeletal system are examined in detail to determine 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 spinal and upper limb devices are analyzed from the viewpoint of the mechanical forces at work and their effect on the disabled person. Prerequisite: PROR 2222.

PROR 4330 (P/OT 402) Practicum—See PROR 2222. Prerequisite: PROR 3300, BHSC 3310.

PROR 4400 (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. 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: PROR 3320.

PROR 4410 (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.

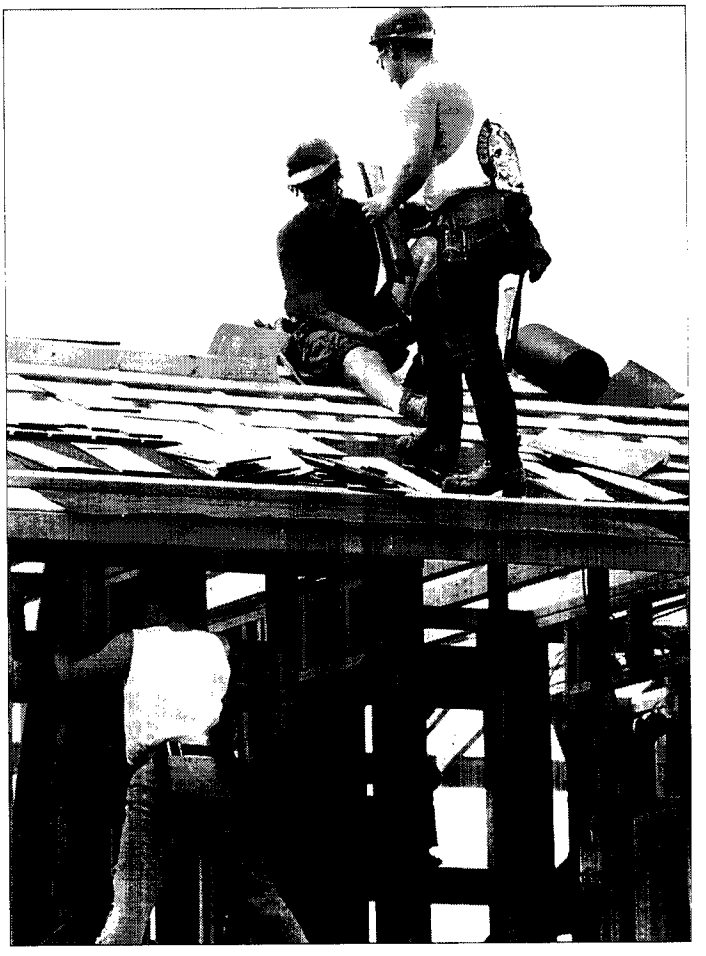
Faculty and Staff

M. Bernadet Ratsoy, B.Sc.N., M.Sc., R.N., Associate Dean
Wm. J. McGuiness, M.A., C.P.O., Program Head
S.U. Raschke, B.A., C.O.









SCHOOL OF TRADES TRAINING

186/ **ADMINISTRATION**
Office of the Dean
Aviation Trades
Construction and Metal Industries Training
Mechanical Industries Training
Apprenticeship

186/ **AIRCRAFT MAINTENANCE ENGINEER: CATEGORY M**

187/ **AIRCRAFT STRUCTURES**

187/ **AUTO COLLISION REPAIR/REFINISHING**

188/ **AUTOMOTIVE ELECTRONICS TECHNICIAN**

189/ **AUTOMOTIVE MECHANIC**

190/ **AUTOMOTIVE SERVICE TECHNICIAN**

190/ **AVIONICS: CATEGORY E**

191/ **BOILERMAKING**

192 **CARPENTRY**

192/ **COMMERCIAL TRANSPORT MECHANIC (TRUCK AND BUS)**

193/ **COMPUTER NUMERICAL CONTROL (CNC) MACHINIST**

194/ **CNC PROGRAMMER**

194/ **ADVANCED CNC PROGRAMMER**

195/ **DIESEL ENGINE MECHANIC**

196/ **DRAFTING**
Civil
Mechanical
Structural
Architectural Design

197/ **GAS TURBINE TECHNICIAN**

198/ **HEAVY DUTY MECHANIC**

198/ **INBOARD/OUTBOARD MECHANIC**

199/ **INDUSTRIAL MAINTENANCE MECHANIC**

200/ **IRONWORKING**

200/ **JOINERY (CABINETMAKER)**

201/ **MACHINIST**

201/ **MILLWRIGHT**

202/ **MOTORCYCLE MECHANIC**

203/ **PAINTING AND DECORATING**

203/ **PLUMBING**

204/ **POWER ENGINEERING: GENERAL PROGRAM**

205/ **POWER ENGINEERING: TECHNICAL PROGRAM**

205/ **POWER AND PROCESS ENGINEERING: 3RD CLASS**

206/ **SHEET METAL WORKING**

207/ **STEAMFITTING**

207/ **STEEL FABRICATING**

208/ **TOOL AND DIE TECHNICIAN**

209/ **WELDING: PROVINCIAL WELDER CERTIFICATE PROGRAM**

SCHOOL OF TRADES TRAINING

ADMINISTRATION

Office of the Dean

Raymond Walton, B.A.Sc., M.Sc., N.Eng., Dean

Power Engineering
- *General Program*
- *Technical Program*

Power and Process Engineering—3rd Class

Aviation Trades

Bill Foyle, A.M.E., Associate Dean
Aircraft Maintenance Engineer (M.)
Aircraft Structures
Avionics (E.)
Gas Turbine Technician

Construction and Metal Industries Training

Mike Cannell, Associate Dean
Construction
Carpentry
Drafting
Joinery (Cabinetmaker)
Painting and Decorating
Plumbing
Steamfitting
Metal Industries
Boilermaking
Ironworking
Sheet Metal Working
Steel Fabricating
Welding

Mechanical Industries Training

Ron Evans, Associate Dean
Auto Collision Repair/Refinishing
Automotive Electronics Technician
Automotive Mechanic
Automotive Service Technician
Commercial Transport Mechanic
Computer Numerical Control (CNC) Machinist
CNC Programmer
Advanced CNC Programmer
Diesel Engine Mechanic
Heavy Duty Mechanic
Inboard/Outboard Mechanic
Industrial Maintenance Mechanic
Machinist
Millwright
Motorcycle Mechanic
Tool and Die Technician

Apprenticeship

See page 13.

AIRCRAFT MAINTENANCE ENGINEER: CATEGORY M

Diploma of Trades Training

This program is recognized by Transport Canada. Graduates are accredited with 18 months toward the four-year practical experience required for the A.M.E. License.

Job Opportunities

Theoretical and practical training enables students to carry out maintenance tasks on light, medium, heavy, fixed and rotary wing aircraft. Providing the necessary preparation for employment in the aviation industry, first as an aircraft mechanic learner and later as a mechanic or Aircraft Maintenance Engineer (Category M License). Successful completion of the program assures 18 months credit toward the Category M License.

The Program

Program content includes aircraft powerplant and air frame; air frame and powerplant control systems and components; electrical and avionics; ground equipment operating principles; methods of servicing, maintenance and repair, testing, parts identification and use for maintaining aircraft and their components; how to use manuals, technical bulletins, documentation systems, air regulations, etc., in the planning and maintenance of aircraft and their components.

Program Content

AVAM 1104	General Aircraft Practices
AVAM 1107	Mechanics of Flight, Structures
AVAM 1108	Elementary Reciprocating Engines
AVAM 1109	Ignition Systems
AVAM 1110	Fuel Metering Systems
AVAM 2207	Basic AC and DC Electricity
AVAM 2208	Power Generation and AC and DC Systems
AVAM 2209	Basic Avionics
AVAM 2210	Sheet Metal
AVAM 2211	Aircraft Systems I (Plumbing, Hydraulics, Landing Gear)
AVAM 3300	Control Systems and Rigging
AVAM 3301	Rotary Wings
AVAM 3302	Propellers
AVAM 3303	Gas Turbines
AVAM 3304	Powerplant Systems
AVAM 4400	Instruments
AVAM 4401	Aircraft Systems 2
AVAM 4402	Air Regulations
AVAM 4403	Aircraft Maintenance, Inspection and Repair
AVAM 4404	Aircraft Maintenance Techniques and Procedures

Program Length

16 months full-time.

Total Fees (subject to change—may not include book and equipment costs)

$3,868 for the 16-month program (1993/94).

Normal Course Hours

0800-1530, Monday through Friday.

Prerequisites

Category M: High School graduation with Math 11 and Physics 11. Good color vision is essential. A mechanical background is recommended. Consideration may be given to mature students with appropriate work experience.

BCIT presently has agreements with a number of School Districts throughout the province which give special status to Career Preparation graduates. A limited number of seats are available for Career Preparation graduates entering directly from secondary school. To gain preferential entry, students must meet the above prerequisites, complete a related Career Preparation Program, have good grades in Math 11 and English 12, and be successful in the interview process. For additional information see your high school counsellor, Technical Education teacher, or call BCIT Student Services at 434-3304, or 1-800-667-0676 for enquiries from outside the Greater Vancouver area.

Instructors

Jack Baryluk, A.M.E.
Larry Bell, A.M.E.
John Edwards, A.M.E.
Gary Grass, A.M.E.
Alan Keeling, A.M.E.
Brian Lockwood, A.M.E.
Stephen Peszel, A.M.E.
Brian Proulx, A.M.E.
Charles Torrey, A.M.E.
David Upton, A.M.E.

AIRCRAFT STRUCTURES

Certificate Program

This program trains students in the basics of repairs to aircraft structures. How to use materials and tools safely; how to repair damaged composite/stressed skin aircraft structures; the major parts of an aircraft; the laws of nature governing flight and the forces acting on aircraft structures; how to interpret simple shop drawings and blueprints; how to use manufacturers manuals in the repair of aircraft structures; the role of Transport Canada in the aviation industry; the importance of time management in profitability.

Job Opportunities

Theoretical and practical training enables students to carry out repairs to composite and stressed skin (sheet metal) aircraft of varying types, and provides the basis for employment in the aircraft industry as a learner structures mechanic.

Aircraft structures graduates have found lifetime careers in the aviation industry. Several companies give preference to BCIT students when hiring new learner mechanics.

Program Content

AVAM 1104	General Aircraft Practices
AVST 1105	Shop Practices
AVST 1106	Aircraft Sheet Metal Construction
AVST 2204	Advanced Sheet Metal Construction and Repair Techniques
AVST 2205	Aircraft Specialised Construction and Repair Techniques
AVST 2206	Composite Materials

Program Length

8 months full-time.

Normal Course Hours

0800-1530, Monday through Friday.

Total Fees (subject to change—may not include book and equipment costs)

$998 for the 8-month program (1993/94).

Prerequisites

High School graduation with Math 11A or Aviation Trade Math **or** pretest. Good color vision is essential. Some drafting is recommended. Consideration may be given to mature students with appropriate work experience.

BCIT presently has agreements with a number of School Districts throughout the province which give special status to Career Preparation graduates. A limited number of seats are available for Career Preparation graduates entering directly from secondary school. To gain preferential entry, students must meet the above prerequisites, complete a related Career Preparation Program, have good grades in Math 11 and English 12, and be successful in the interview process. For additional information see your high school counsellor, Technical Education teacher, or call BCIT Student Services at 434-3304, or 1-800-667-0676 for enquiries from outside the Greater Vancouver area.

Instructors

Malcolm Stirling, A.M.E.
Jim Henke, A.M.E.

Please note: the School of Trades Training, through its Part-time Studies department, offers a wide range of part-time courses related to the aviation industry.

AUTO COLLISION REPAIR/ REFINISHING

Cooperative Diploma Program

Job Opportunities

Training prepares students for entry-level employment in the automotive collision repair and refinishing trade.

Autobody repair and refinishing personnel are currently in short supply in British Columbia and graduates of the program have an excellent chance of finding employment. The major employers of autobody personnel are dealerships, privately owned service shops and franchised automotive service shops.

The Program

Basic theory and related information, along with hands-on shop practice, enable students to become proficient in autobody repair. At the end of a 26-week Core Program, students progress into intermediate and advanced levels of the collision repair or refinishing options.

Applicants must be in good physical condition and have good color vision and freedom from respiratory problems; must be non-allergic to paint and thinners; and clean shaven as per WCB Regulations. Potential students with medical or physical difficulties should contact Student Services to arrange an interview (telephone interview if out of town) with the Institute's Special Needs Counsellor, (604) 434-3304.

Cooperative Education

This is a Cooperative Education Program which combines academic terms with paid cooperative work terms. Cooperative Education is not an option but an integral part of this program, subject to the same successful performance criteria as the program itself. While Coop Coordinators find the majority of job placements for students, it must be recognized that during certain periods of the business cycle, job placements may be hard to find. It is then the responsibility of the student to work with the Coordinator (and indeed on his/her own) to find a meaningful work experience. For more information see page 14. The complete Cooperative Education policy including student, institute and employer responsibilities is available through the Cooperative Education Office and the Registrar's Office.

Coop Coordinator: Gino Simeoni 432-8291
General Enquiries: 432-8634
The Cooperative Education Office is located in Building NW 2.6.

Program Content

Core (repair/refinishing)
Use safe work practices
General shop practice
Welding
Electrical systems
Cooling systems
Air conditioning
Rebuild methods, techniques of shaping metals
Fitting methods
Refinishing

Intermediate (repair/finishing)
Operate welding equipment
Auto body construction
Panel replacement
Fibreglass in panel repairs
Refinishing

Advanced (repair)
Evaluate damage
Remove and replace body components
Replace panels
Use shop equipment
Business management

Advanced (refinishing)
Identify type and condition of finishes
Use shop tools
Surface preparation
Use refinishing equipment
Use masking materials and equipment
Use undercoats
Use topcoats

Specialty Repair
New science of unibody repair
Business management practices
Trends in technology

Specialty Refinishing
Apply special finishes
Business management practices
Trends in technology

Program Length

Total length of the program is 87 weeks full-time which includes a 39-week work term.

Normal Course Hours

0700-1415, Monday through Friday.

Total Fees (subject to change—may not include book and equipment costs)

$1,977 for the complete program (1993/94).

Prerequisites

High School graduation or successful completion of an entrance test in math and reading skills. Valid B.C. Driver's Licence required. Good physical condition, freedom from respiratory problems and non-allergic to paints, thinners, etc.

BCIT presently has agreements with a number of School Districts throughout the province which give special status to Career Preparation graduates. A limited number of seats are available for Career Preparation graduates entering directly from secondary school. To gain preferential entry, students must meet the above prerequisites, complete a related Career Preparation Program, have good grades in Math 11 and English 12, and be successful in the interview process. For additional information see your high school counsellor, Technical Education teacher, or call BCIT Student Services at 434-3304, or 1-800-667-0676 for enquiries from outside the Greater Vancouver area.

Instructors

Gordon Smith
Clarence Heppner

AUTOMOTIVE ELECTRONICS TECHNICIAN

Certificate Program

This program will take technicians through basic electrical diagnosis and repair to the latest "state of the art" automotive electronics. Courses leading to completion of this certificate program may be taken through full-time or part-time studies.

Job Opportunities

Graduates of this program are prepared for entry level employment in automotive electronics repair shops.

Program Content

Batteries and starting systems
Electronic engine management
Charging systems
Electronic fuel systems
Electronic ignition systems
Emission controls
Electronic suspension systems
A.B.S. brakes
Body electronics
Electrical/electronic steering
Air conditioning electronic controls
Alternate fuel tuning
Automatic transmission electronics

Program Length

17 weeks full-time.

Normal Course Hours

0700-1345, Monday through Friday.

Total Fees (subject to change—may not include book or equipment costs)

$493 for the 17-week program (1993/94).

Prerequisites

Apprentice with minimum 2 years in the trade;
or
Jouneyed or T.Q. status (must provide license number);
or
Successful completion of Automotive Mechanic program;
or
Mechanical Assessment test and entry level pre-test (Math and English)**

** Mechanical Assessment testing is available in the Mechanical Resources Centre.

Mechanical Assessment Test

The test will take up to one hour to complete. The general basis of the exam will be questions on electrical/electronics related to automotive repair.

Procedure
All interested persons must fill out an application form prior to being allowed to write the pre-test. The Admissions department (ground floor, SW1 Building) will supply applicants with a form to take to the Resource Centre so that Resource Centre (NE26) staff know that the applicant is eligible to write the exam. Resource Centre staff will mark the exam and complete the results section of the form for return to the Admissions department.

Resource Centre Hours
Pre-testing is available Monday to Friday, between 0830 and 1400 hours. The Resource Centre is located in the NE 26 Building. Information regarding the entry level pre-test for Math and English is available by calling 434-5734 local 5279.

Instructor
Richard Plett, T.Q., I.P., I.D.

AUTOMOTIVE MECHANIC

Certificate Program

Automotive mechanics repair and test motor vehicles. They disassemble, inspect and assemble engines and accessories, cooling systems, transmissions and clutches, drive lines, braking and suspension systems. Automotive mechanics employ logic and deductive reasoning in diagnosing and troubleshooting vehicle mechanical and electrical/electronic systems.

Job Opportunities
Changes in the automobile of today are providing many new opportunities for individuals looking for a challenging career in this service industry. Employers are searching for young men and women with mechanical aptitude who are well motivated and willing to work and learn. Employment is found with local service stations, dealerships and chains of specialty repair shops. A typical career path involves starting as a trainee until an apprenticeship becomes available. Although employment opportunities are mixed at this point, a reasonably good percentage of graduates are still expected to be successful getting into the trade.

The Program
BCIT's entry level Automotive Mechanic Program provides the basic knowledge and practical skills to meet the needs of both students and employers for entry into the automotive industry. Upon graduation, students are faced with career choices in specialty shops such as; brakes and alignments, automatic transmissions, tune-ups, etc., or to pursue a career as a General Repair Technician. Many of these are apprentice trades where credit may be given for completion of this program.

Automotive mechanic students must have a valid driver's license. Good physical condition is desirable. Potential students with medical or physical difficulties should contact Student Services to arrange an interview (telephone interview if out of town) with the Institute's Special Needs Counsellor, (604) 434-3304.

Program Content
Use safe work practices
Solve mathematical problems
Apply science concepts
Process technical information
Use basic measuring and layout hand tools
Use power tools
Use fasteners and fittings
Lift loads
Welding
Describe basic hydraulic systems
Use mechanics shop equipment
Operate selected gas-powered equipment
Describe mechanics trades
Service wheels, tires, hubs and bearings
Service suspension systems
Service steering systems
Service hydraulic brake systems
Perform gasoline engine major overhaul
Service engine support systems
Service transmissions
Service drive lines and drive axles
Service electrical systems
Service emission control systems
Prepare for employment

Program Length
33 weeks full-time. Students may receive credit for selected modules depending on previous training.

Normal Course Hours
0700-1345 (first shift); 1000-1545 (second shift), Monday through Friday. Shift will be assigned at orientation session.

Total Fees (subject to change—may not include book and equipment costs)
$1,137 for the 33-week program (1993/94).

Prerequisites
High School graduation with English 12 and Math 11 with C or better; **or** Successful completion of a BCIT pre-test measuring math and reading skills. A valid drivers license that is acceptable for use in B.C. is required.

BCIT presently has agreements with a number of School Districts throughout the province which give special status to Career Preparation graduates. A limited number of seats are available for Career Preparation graduates entering directly from secondary school. To gain preferential entry, students must meet the above prerequisites, complete a related Career Preparation Program, have good grades in Math 11 and English 12, and be successful in the interview process. For additional information see your high school counsellor, Technical Education teacher, or call BCIT Student Services at 434-3304, or 1-800-667-0676 for enquiries from outside the Greater Vancouver area.

Instructors
Norm Cloutier, T.Q., I.P., I.D.
Terry Fletcher, I.D.,T.Q.,I.P.,
David Huesken, I.D.,T.Q.,I.P., Chief Instructor
Vito Ialungo, T.Q., I.D.
Rob Macgregor, I.D., T.Q., I.P., Chief Instructor (AST, AET groups)
Jim Marchant, I.D., T.Q., I.P.
David Ney, T.Q., I.P. (GM Auto Group)
Vince Piva, T.Q., I.P., I.D.
Richard Plett, T.Q., I.P., I.D.
Fred Raadsheer, I.D., T.Q., I.P. Chief Instructor (GM Auto Group)
Gary Remenyk, T.Q., I.P.
Gabor Retei, T.Q., I.P.
Mel Rudeen, I.D., T.Q., I.P.
Sandy Sudom, I.D., T.Q., I.P., B.Ed.
Mike Thomas, T.Q., I.P., I.D.
Tim Wood, T.Q., I.P.

AUTOMOTIVE SERVICE TECHNICIAN

Cooperative Diploma Program

This specialized training program has been designed to meet the need for skilled technicians who can diagnose and repair the sophisticated systems in today's automotive vehicles.

In addition, the automotive industry needs skilled administrative personnel who have technical as well as business training, to manage the growing automotive repair business. No longer is it possible for owners to repair today's sophisticated vehicles themselves.

The Automotive Service Technician program answers both of these needs.

Why This Training Program?

Students come to BCIT for state-of-the-art training given by top-notch instructors in our first-class training facilities.

Employer Reaction To The Program

Because the local automotive industry employs AST students during the cooperative work terms, these students gain valuable practical experience and employers have a great opportunity to evaluate the worth of the program and the calibre of the trainees. Employers have expressed great interest in employing graduates of the AST program.

Salaries

Starting salaries for our graduates are in the region of $12 per hour. AST graduates will go on to complete their apprenticeship training and, upon certification, they will earn approximately $40 thousand (plus) per year.

The Program

The AST program consists of four 13-week academic terms at BCIT where students will receive training common to both the technical and business aspects of the automotive industry. The first three academic terms will alternate with three, 13-week coop work terms in an automotive repair facility.

On completion of the program, students will receive an Automotive Technician Diploma and may be able to challenge academic portions of the Provincial Apprenticeship curriculum.

COOPERATIVE EDUCATION

This is a Cooperative Education Program which combines academic terms with paid cooperative work terms. Cooperative Education is not an option but an integral part of this program, subject to the same successful performance criteria as the program itself. While Coop Coordinators find the majority of job placements for students, it must be recognized that during certain periods of the business cycle, job placements may be hard to find. It is then the responsibility of the student to work with the coordinator (and indeed on his/her own) to find a meaningful work experience. For more information see page 14. The complete Cooperative Education policy including student, institute and employer responsibilities is available through the Cooperative Education Office and the Registrar's Office.

Coop Coordinator: Gino Simeoni 432-8291
General Enquiries: 432-8634
The Cooperative Education Office is located in Building NW 2.6.

Program Length

Two years full-time.

Normal Course Hours

0700-1530, Monday through Friday.

Total Fees (subject to change—may not include book or equipment costs)

$2,093 for the two-year program (1993/94).

Prerequisites

High School graduation with Math 11 with C+ and English 12 with C or successful completion of a pre-entry exam. Applicants must also attend a personal interview to determine their suitability for the program. An interview is granted only after academic requirements have been met.

Potential students with medical or physical disabilities should contact Student Services to arrange an interview with the Institute's Special Needs counsellor. Tel. 434-3304.

BCIT presently has agreements with a number of School Districts throughout the province which give special status to Career Preparation graduates. A limited number of seats are available for Career Preparation graduates entering directly from secondary school. To gain preferential entry, students must meet the above prerequisites, complete a related Career Preparation Program, have good grades in Math 11 and English 12, and be successful in the interview process. For additional information see your high school counsellor, Technical Education teacher, or call BCIT Student Services at 434-3304, or 1-800-667-0676 for enquiries from outside the Greater Vancouver area.

Instructors

Rob MacGregor, Chief Instructor
Gary Remenyk, T.Q., I.P.
Gabor Retei, T.Q., I.P.

AVIONICS: CATEGORY E

Diploma of Trades Training

This program is recognized by Transport Canada. Graduates are accredited with 18 months toward the three-year practical experience required for the A.M.E. Category "E" License.

The program provides in-depth knowledge of electricity, electrical generation, power distribution, analog electronics, digital electronics and radio theory. Students learn to interpret and comply with Transport Canada Regulations and Airworthiness Standards.

The program enables students to understand the operating principles of aircraft, powerplants, avionics and associated ground equipment; theoretical and practical knowledge of basic systems, components and methods to service, overhaul and repair aircraft electrical and avionics systems; to identify and state the major components and functions of electrical communication, navigation and instrumentation systems; how to use technical bulletins, manuals and associated documentation when planning and carrying out tests; maintenance and repairs to aircraft electrical, avionics, ground equipment and associated systems or sub-systems.

Job Opportunities

Training enables students to carry out maintenance tasks on light, medium or heavy fixed-wing and rotary-wing aircraft, and provides the preparation necessary for entry level employment in the aviation industry as a technician or Aircraft Maintenance Engineer (Category "E" License).

Program Content

AVAM 1104	General Aircraft Practices
AVAM 1107	Mechanics of Flight, Structures
AVAV 1111	Introduction to Avionics
AVAV 1112	Aircraft Electrical Systems
AVAV 2212	Aircraft Mechanical Systems 1
AVAV 2213	Aircraft Mechanical Systems 2
AVAV 2214	Air Regulations
AVAV 2215	Aircraft Instruments
AVAV 3305	Avionics Installation
AVAV 3306	Radio Communications
AVAV 3307	Avionics Systems
AVAV 3308	Avionics Test Equipment
AVAV 4405	Avionics Flight Line Maintenance
AVAV 4406	Navigation and Communications
AVAV 4407	Avionics Techniques and Procedures

Program Length

16 months full-time.

Normal Course Hours

088-1530, Monday through Friday.

Total Fees (subject to change—may not include book or equipment costs)
$3,868 for the 16-month program (1993/94).

Prerequisites
Electronics Technician Common Core Program or equivalent, plus High School graduation with Math 11 with C (Math 12 preferred). Good color vision is essential.

Instructors
Vincent Murray, A.M.E.
Doug Grant, A.M.E.
Greg Lambrecht, A.M.E.

BOILERMAKING

Certificate Program

Boilermakers possess the full range of knowledge and skills required to fit, install, assemble, erect, repair and maintain a wide variety of vessels, tanks, towers, hoists and other structures, as well as ancillary equipment and fixtures made of metal and fiberglass materials.

Job Opportunities
Training prepares students for entry-level employment as boilermakers (erectors). Upon successful completion of the program, students should seek employment as an apprentice.

Graduates of this program are eligible for acceptance into the International Brotherhood of Boilermakers, Iron Ship Builders, Blacksmiths, Forgers and Helpers Lodge 359. Apprenticeships are arranged through the union which dispatches workers to job sites throughout B.C. and the Yukon. Possible work sites include pulp mills, refineries and hydro electric projects.

The Program
Basic theory and related information along with hands-on shop practice enable students to become competent in basic vessel construction tasks.

Boilermakers must be able to work at heights. Good physical condition is desirable. Potential students should arrange an interview with a Boilermaking Instructor at (604) 432-8203.

Program Content
Describe the boilermaking trade
Apply safe and acceptable work practices
Mathematics
Sketch and read drawings
Develop patterns and make templates for shop application
Use basic measuring, layout, hand and power tools
Use metal fabrication power equipment
Use oxyacetylene
Arc welding
Apply rigging
Apply layout and fitting techniques
Fabricate and erect tanks
Fabricate and erect boiler components
Fabricate and erect penstocks
Assemble and dismantle refinery components
Fiberglass reinforced plastics

Program Length
23 weeks full-time.

Normal Course Hours
0700-1345, Monday through Friday.

Total Fees (subject to change—may not include book or equipment costs)
$847 for the 23-week program (1993/94)

Prerequisites
Grade 10 or pre-test. Department interview also required.

Instructors
Joe Kiwior
Richard MacIntosh

CARPENTRY

Certificate Program

Carpentry is divided into three sections: framing, concrete forming and finish work. The framing carpenter builds the basic structure (foundations, floors, walls and roof). The concrete forming carpenter builds the formwork necessary for the placement of concrete. The finish carpenter applies wall panelling and trim, exterior siding and trim, builds cabinets and stairs. Most carpenters are skilled in all areas of construction but tend to specialize in one area.

Today, with so many new products and techniques, some carpenters specialize in one particular field of the trade. Among the specialties are:

- site preparation and layout
- blueprint reading
- installing cabinets and hanging doors
- building stairs and railings
- installing exterior siding.

Job Opportunities

The steady upturn in the construction industry has resulted in increased employment opportunities for carpenters. Most jobs are in the residential building section although some employment is available in commercial and industrial projects.

The Program

Training prepares students for entry-level employment in the carpentry trade. Basic theory and related information along with hands-on shop practice enable students to become competent in basic carpentry tasks. Upon successful completion of the program, students should seek employment as an apprentice.

Carpenters must be able to work at heights and in adverse weather. Potential students with medical or physical difficulties should contact Student Services to arrange an interview (telephone interview if out of town) with the Institute's Special Needs Counsellor, (604) 434-3304.

Program Content

Use safe work practices
Solve mathematical problems
Sketch and read drawings
Care and use of hand tools
Care and use of portable power tools
Care and use of shop equipment
Identify and use materials
Lift and support loads
Site preparation and layout
Concrete and formwork
Specialty tools
Floor and wall framing
Ceiling and roof framing
Exterior finishing
Interior finishing
Cabinets and finishes
Prepare for employment

Program Length

28 weeks full-time with 5 to 6 classes starting each year.

Normal Course Hours

0730-1415, Monday through Friday.

Total Fees (subject to change—may not include book or equipment costs)

$992 for the 28-week program (1993/94).

Prerequisite

Grade 10 or pre-test.

BCIT presently has agreements with a number of School Districts throughout the province which give special status to Career Preparation graduates. A limited number of seats are available for Career Preparation graduates entering directly from secondary school. To gain preferential entry, students must meet the above prerequisites, complete a related Career Preparation Program, have good grades in Math 11 and English 12, and be successful in the interview process. For additional information see your high school counsellor, Technical Education teacher, or call BCIT Student Services at 434-3304, or 1-800-667-0676 for enquiries from outside the Greater Vancouver area.

Instructors

Rick Dohl, B.Ed., T.Q., I.P., Carpentry
John-Allan Eliasen, T.Q., I.P., Carpentry/Joinery I.D.
Poul Jacobsen, T.Q., I.P., Carpentry I.D.
Poul Nielson, T.Q., I.P., Carpentry I.D.
Wayne Stevens, T.Q., I.P., Carpentry/Joinery I.D.
Kurt Traugott, B.Ed., T.Q., Carpentry
Peter Wilson, T.Q., I.P., Carpentry/Joinery I.D. Chief Instructor
R. Ainsworth, T.Q., I.P., Carpentry I.D.
K. Simpson, T.Q., I.P., Carpentry, I.D.
Kal Klasen, T.Q., I.P., Carpentry, I.D.
Luigi Fontana, T.Q., Carpentry I.D.

COMMERCIAL TRANSPORT MECHANIC

(TRUCK AND BUS MECHANIC)

Certificate Program

Commercial transport mechanics overhaul, recondition, repair, and maintain highway trucks, buses, fork-lifts and refrigeration-equipped tractor trailers. Diagnostic troubleshooting is an important skill. Students learn to do tune-ups and general servicing of highway vehicles and disassembly/reassembly of various vehicle parts: motor, transmission, clutch, differential, suspension system and brakes.

Job Opportunities

Training prepares students for entry-level employment as commercial transport mechanics. Upon successful completion of the program, students should seek employment as an apprentice.

There has been an increase in opportunities in this trade generally, as the inspection of commercial vehicles has recently become compulsory. As the trade is expanding at this point, apprenticeship opportunities should become available. Graduates of this program are encouraged to seek formal apprenticeships in the industry.

The Program

Basic theory and related information along with hands-on shop practice enable students to become proficient in basic mechanical maintenance of commercial transport and passenger vehicles.

Because some heavy lifting is involved, good physical condition is desirable. Potential students with medical or physical difficulties should contact Student Services to arrange an interview (telephone interview if out of town) with the Institute's Special Needs Counsellor, (604) 434-3304.

Program Content

Describe mechanical trade
Solve mathematical problems
Describe and use safe work practices
Technical communications
Apply science concepts
Electrical principles and practice
Start, run, move, shut down selected equipment
Describe and use mechanic's hand tools and measuring tools
Describe and use mechanic's power tools
Describe and service hydraulic systems
Oxyacetylene welding
Arc welding
Lifting and blocking
Describe and overhaul internal combustion engines
Describe and service engine support systems
Describe and service transmissions

Describe and service clutches
Describe and service differentials
Describe and service steering systems
Describe and service frames, suspensions and attachments
Describe and service hydraulic brake systems
Describe and service air brake systems
Describe and service air operated controls and accessories

Program Length
30 weeks full-time.

Normal Course Hours
0700-1345, Monday through Friday.

Total Fees (subject to change—may not include book or equipment costs)
$1,050 for the 30-week program (1993/94).

Prerequisite
High School graduation or pre-test.

BCIT presently has agreements with a number of School Districts throughout the province which give special status to Career Preparation graduates. A limited number of seats are available for Career Preparation graduates entering directly from secondary school. To gain preferential entry, students must meet the above prerequisites, complete a related Career Preparation Program, have good grades in Math 11 and English 12, and be successful in the interview process. For additional information see your high school counsellor, Technical Education teacher, or call BCIT Student Services at 434-3304, or 1-800-667-0676 for enquiries from outside the Greater Vancouver area.

Instructors
Peter Congdon, I.D., Com.Trans., I.P., Auto I.P.
Ewan Sheard, Com.Trans. I.P., Auto I.P., B.Ed., H.D. T.Q.
Larry Strong, I.D., Auto.I.P., Com.Trans. Auto I.P.
Keith Whitter, Com. Trans T.Q., Auto I.P.

COMPUTER NUMERICAL CONTROL (CNC) MACHINIST

Certificate Program

This 420-hour program trains students to operate CNC machines. Training is designed for machinists and other tradespersons wishing to upgrade their skills in the operation and introductory programming of CNC equipment.

Mathematical topics which are interwoven throughout all subject areas include: using algebra, geometry and trigonometry calculations to solve problems relating to CNC programs and locating required information from the "Machinery's Handbook" tables.

Job Opportunities
This efficient and precise method of machine operation has a variety of applications in machine shops, the tool and die and mold making fields, the aircraft industry, metal 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.

Program Content
Safety (10 hours)—Application of proper manual lifting techniques, safe work practices and survival first aid procedures. Compliance with rules governing the handling of hazardous materials.

Introduction to Computers (20 hours)—Identification of microcomputer system components and use of basic DOS commands to copy, delete, rename, etc. Application of editing operations to CNC programs.

CNC Training Machines (90 hours)—Writing and debugging simple CNC programs, operating the machine control panel, inputting and editing programs, setting up the machine and using proper operating procedures.

CNC Turning Centre (120 hours)—Loading programs into memory, writing and debugging programs, using various special machining cycles and performing setup operations with the Fanuc and Okuma controls. Practising proper maintenance procedures. Application of tool offsets and radius compensation.

CNC Milling Machine (60 hours)—Performing operations using the General Numeric Control. Creation and use of MDI programs.

CNC Machining Centre (120 hours)—Selection of proper work-holding methods. Tooling setup in the automatic tool changer. Establishment of tool length and diameter compensations. Use of graphics for tool path verification. Creation of MDI programs on the Meldas and Okuma controls. Development of sub-programs for various machining operations.

Program Length
14 weeks full-time.

Course Hours
0700-1400, Monday through Friday.

Total Fees (subject to change—may not include book or equipment costs)
$406 for the 14-week program (1993/94).

Prerequisites
Applicants should have completed a machinist entry level trades training program, hold a trade certificate or journeyed status or have equivalent demonstrated ability in the following areas: use of conventional shop equipment; safe work practices; mathematical problem-solving; machine shop geometry and angles; reading and interpreting drawings and using precision measuring instruments.

Instructors
Ted Marchant, I.D., T.Q., I.P.
Fred Shim, I.D., I.P., Mech. Tech.

CNC PROGRAMMER

Certificate Program

The objective of this 240-hour program is to further improve the skills of graduates from the basic level. The intermediate level provides intensive applied training in computer-assisted programming, macro programming and graphic workstations for CAD/CAM applications. The student will be introduced to the concepts and applications of tool life management systems.

Job Opportunities

These programming techniques are of great advantage to all manufacturing shops using CNC machinery. Excellent job placement rates are anticipated as the use of CNC equipment expands throughout the province.

The Program

Topics which are interwoven throughout all subjects areas include: principles of clamping and workpiece location, use of fixture, selection of tooling, operation planning (sequencing), preparation of tooling and setup sheets, maintaining complete and accurate documentation, and selection of the most appropriate machines for a designated job.

Program Content

Manual Programming (30 hours)—Overview of the basic G-codes and follow-through using special canned and multiple repetitive cycles. Creation of CNC programs using text editing software; mathematical calculations using utility program. Mirroring and rotation functions.

Automatically Programmed Tools (APT) (15 hours)—Explanation of program structure, geometry definitions, cutting motions, toolchange statements, file management and plotting using a PC-based version of APT.

Macro Programming (20 hours)—Use of the Fanuc control to program for measuring probes, families of parts, variable programming and logical operations.

Graphics Programming 2-Dimensional (100 hours)—Use of CAM programs to create geometry and procedure toolpaths. Creation of material and tool libraries for future use. Exploration of backplotting, CNC code editors and communication modules. Importing drawing files from CAD software in various formats including IGES and DXF. Creation of code generators.

Computer Aided Drafting (CAD) (45 hours)—Designing and dimensioning parts in standard orthographic projections and plotting the finished blueprint. Use of layers to associate the geometry with specific tools.

Data Communications (15 hours)—Use of communications software to allow a computer to be connected to a CNC machine for the purpose of uploading and downloading programs. Examination of baud rates, hand shaking, and cable configurations.

Tool Life Management (15 hours)—Introduction to the concept and application of tool life management. Identification and selection of tool groups along with an overview of redundant tool and tool usage features.

Program Length

8 weeks full-time.

Course Hours

0700-1400, Monday through Friday.

Total Fees (subject to change—may not include book or equipment costs)

$232 for the 8-week program (1993/94).

Prerequisites

Applicants must be graduates of CNC Machinist Program or show satisfactory experience as CNC machine operators, journeyed machinists, or journeyed tool and die makers with CNC operating experience. Other applicants must verify their level of competence for admission to the program through a formal interview.

Instructors

Ted Marchant, I.D., T.Q., I.P.
Fred Shim, I.D., I.P., D.P.T.

CNC PROGRAMMER—ADVANCED

Certificate Program

This 240-hour advanced program will improve the programming skills of graduates of CNC Programmer. The advanced level includes applications of the UNIX system, macro and 3-D graphics programming, tool life management, CAD, CMM, as well as an introduction to job estimating.

Job Opportunities

This advanced programming is of great advantage to industries requiring complex surfaces and three-dimensional programming and to shops manufacturing injection and blow molds. Graduates will be able to analyze industry needs and make recommendations on the selection of equipment for specific situations.

The Program

Topics which are interwoven throughout all subject areas include: principles of clamping and workpiece location, use of fixtures, selection of tooling, operation planning (sequencing), preparation of tooling and setup sheets, maintenance of complete and accurate documentation, and selection of the most appropriate machines for a designated job.

Program Content

UNIX (20 hours)—Introduction to the UNIX operating system including commands, files and directory structures.

Macro Programming (20 hours)—Production of various shapes using mathematical formulas (ellipses, spheres, etc.) and creation of macro programs for the use of positioning probes.

Graphics Programming 3-Dimensional (130 hours)—Uses advanced features of CAM software to produce cutter paths in 3 dimensions for 4 and 5-axis positioning mills. Application of wireframe geometry to building complicated models. Process for geometric projections onto surfaces and 3-axis cutter compensation for 3-D work.

Tool Life Management (20 hours)—Introduction to adaptive controls for sensing the variations in machining conditions through torque, deflection, vibration, wear, etc.

Job Estimating (10 hours)—Estimation of realistic costs using various CAM software programs plus dedicated estimating programs.

Computer Aided Drafting 2 (20 hours)—Uses advanced features of the design

program by creating arrays, patterns, solids and wire frames.

Coordinate Measuring Machines (CMM) (20 hours)—Uses CNC coordinate measuring machines to inspect workpieces and application of reverse engineering concepts to produce CNC code from existing parts/models.

Program Length
8 weeks full-time.

Course Hours
0700-1400, Monday through Friday.

Total Fees (subject to change—may not include book or equipment costs)
$232 for the 8-week program (1993/94).

Prerequisites
Applicants must be graduates of the CNC Programmer Course. Other applicants must verify their level of competence for admission to the program through a formal interview.

Instructor
Fred Shim, I.D., I.P., D.P.T.

DIESEL ENGINE MECHANIC

Certificate Program

The diesel engine mechanic repairs, maintains and rebuilds diesel engines which power a wide variety of mobile and stationary machinery. Students learn to disassemble, rebuild and reassemble diesel engines; replace working parts such as pistons, rings, bearings, gears, valves and bushings; rebuild engine blocks, cylinder heads, sub assemblies and components; repair fuel, electrical and cooling support systems.

Job Opportunities
Students are prepared for entry-level employment as diesel engine mechanics. Upon successful completion of the program, students should seek employment as an apprentice.

Diesel engine mechanics are required wherever diesel engines are found in industry: railways, bus and truck lines, the marine industry, repair garages, logging and mining camps, and dealerships. Many opportunities exist in this trade, however, graduates should be prepared to work out of town in entry level jobs in industry until trainee positions become available.

The Program
Basic theory and related information along with hands-on shop practice enable students to become proficient in basic diesel engine maintenance and overhaul procedures.

Because some heavy lifting is involved, good physical condition is desirable. Potential students with medical or physical difficulties should contact Student Services to arrange an interview (telephone interview if out of town) with the Institute's Special Needs Counsellor, (604) 434-3304.

Program Content
Describe mechanical trades
Solve mathematical problems
Describe and use safe work practices
Technical communications
Apply science concepts
Electrical principles and practice
Service electrical systems and components
Start, run, move, and shut down selected equipment
Describe and use mechanic's hand and measuring tools
Describe and use mechanic's power tools
Describe and service hydraulic systems
Oxyacetylene welding
Arc welding
Lifting and blocking
Describe and overhaul internal combustion engines
Describe and service engine support systems
Service cylinder block assemblies
Service emission control systems
Describe diesel fuel systems
Service diesel systems
Troubleshoot diesel engines
Marine gear
Prepare for employment

Program Length
42 weeks full-time beginning in September each year.

Normal Course Hours
0700-1345, Monday through Friday.

Total Fees (subject to change—may not include book or equipment costs)
$1,398 for the 42-week program (1993/94).

Prerequisite
High School graduation or pre-test.

BCIT presently has agreements with a number of School Districts throughout the province which give special status to Career Preparation graduates. A limited number of seats are available for Career Preparation graduates entering directly from secondary school. To gain preferential entry, students must meet the above prerequisites, complete a related Career Preparation Program, have good grades in Math 11 and English 12, and be successful in the interview process. For additional information see your high school counsellor, Technical Education teacher, or call BCIT Student Services at 434-3304, or 1-800-667-0676 for enquiries from outside the Greater Vancouver area.

Instructors
Paul Ehni, I.D., H.D.I.P.
Tom Kozar, I.D., H.D.I.P., Com. Trans. T.Q.

DRAFTING

Certificate Programs

Drafting at BCIT offers training for a variety of applications in Architecture, Building Construction, Mechanical Systems for Building and Industry, Civil & Municipal Construction and Highway design. CAD (Computer Aided Design) is an integral part of all our drafting programs.

All students begin in September and must complete a Drafting Core (8 weeks) and Architectural Building Construction (12 weeks) before proceeding to their drafting specialty (20 weeks). Total program length: 40 weeks.

Career Preparation Graduates

BCIT presently has agreements with a number of School Districts throughout the province which give special status to Career Preparation graduates. A limited number of seats are available for Career Preparation graduates entering directly from secondary school. To gain preferential entry, students must meet the above prerequisites, complete a related Career Preparation Program, have good grades in Math 11 and English 12, and be successful in the interview process. For additional information see your high school counsellor, Technical Education teacher, or call BCIT Student Services at 434-3304, or 1-800-667-0676 for enquiries from outside the Greater Vancouver area.

Prerequisites for Combined Program

High School graduation with Math 11A or pre-test. Good hand/eye coordination and technical aptitude. Students will enter and complete the Drafting Core and Architectural Building Construction portions. Students will then be channelled into their chosen drafting specialty (Civil, Mechanical or Structural Drafting). Note: Applicants must state which drafting specialty they prefer when applying.

PHASE 1—DRAFTING CORE AND ARCHITECTURE BUILDING CONSTRUCTION (20 weeks total)

Drafting Core

Provides students with the basic knowledge and skills of drafting to enter any drafting specialty. The program includes introduction to drafting, math, surveying, and CAD training.

Program Length

8 weeks full-time beginning September each year.

Normal Course Hours

0700 to 1345, Monday through Friday.

Architectural Building Construction

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

Job Opportunities

Possible employment at the junior drafter level.

Program Length

12 weeks full-time.

Normal Course Hours

0700-1345, Monday through Friday

PHASE 2—DRAFTING SPECIALTIES (20 WEEKS). CHOOSE ONE.

1) Civil Drafting

The specialty prepares the student to combine the necessary understanding of building construction with the requirements of municipal regulations.

Job Opportunities

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

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

20 weeks full-time.

Normal Course Hours

0700-1345, Monday through Friday.

Total Fees (subject to change—may not include book or equipment costs)

Core plus Civil Drafting Specialty: $1,160 for the 40-week program (1993/94).

2) Mechanical Drafting

The specialty prepares the student to combine the understanding of building construction with machine and sawmill design.

Job Opportunities

Employment may be found in offices specializing in machine and sawmill design.

Specialty Content

Conveyors and material handling equipment
Chute detailing and plate development
Gear design
Hydraulics
Applied Math and Physics
Strength of materials
Statics
Structural connections, bolting, welding
Shaft design
Casting design

Length of Specialty

20 weeks full-time.

Normal Course Hours

0700-1345, Monday through Friday.

Total Fees (subject to change—may not include book or equipment costs)

Core plus Mechanical Drafting Specialty: $1,160 for the 40-week program (1993/94).

3) Structural Drafting

The specialty provides 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.

Job Opportunities

Students may find employment in engineering offices which deal with reinforced concrete and structural steel.

Specialty Content

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

Length of Specialty

20 weeks full-time.

Normal Course Hours

0700-1345, Monday through Friday.

Total Fees (subject to change—may not include book or equipment costs)

Core plus Structural Drafting Specialty: $1,160 for the 40-week program (1993/94).

ARCHITECTURAL DESIGN : TECHNICAL AND GRAPHICAL COMMUNICATION

In assessing their suitability for this specialty, applicants 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 an understanding of people's needs, of technologies, the humanities 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 clear-cut solutions. Students find that in addition to intellectual and creative ability, they also need initiative, tenacity and a tolerance for uncertainty.

Job Opportunities

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

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 Speciality
40 weeks full-time beginning September each year.

Normal Course Hours
0800-1430, Monday through Friday.

Total Fees (subject to change—may not include book or equipment costs)
$1,160 for the 40-week program (1993/94).

Prerequisites
High School graduation with Math 11. Preference will be given to those who have a C+ in Math 12 and English 12. Applicants will be required to attend a personal interview at which time they will be required to submit the following:

1. A portfolio demonstrating their creative ability in the manipulation of three-dimensional form;
2. A short essay (approximately 500 words) detailing their reasons for choosing Architecture as a career;
3. Applicants will be required to complete an aptitude test administered at the interview.

Instructors
W. Chandler, Instructors Diploma
G. Cullen, B.A., B.Theol., Instructors Diploma
B. Hilliard, Instructors Diploma—Chief Instructor
P. Kavanagh, Instructors Diploma

GAS TURBINE TECHNICIAN

Certificate Program

This full-time engine fitting program will give you the opportunity to develop new skills to overhaul gas turbine engines and other components.

Practical skills include filing, drilling, tapping, threading, fabricating special tools, inspection, nondestructive testing, reporting defects, engine disassembly and assembly, servicing, maintenance, and performance check run ups. BCIT has some 50 gas turbine engines including turbo-props, shafts, jets and fans.

Job Opportunities
Students are expected to develop the high standards of craftsmanship required by engine overhaul manufacturers for the aviation, marine, transportation, power (hydro, etc.), oil and natural gas industries, and Transport Canada.

The course takes place at the Sea Island, Aviation campus.

Program Content
AVAM 1104 General Aircraft Practices—basic handtools, blueprint reading, materials and processes.

AVGT 1113 Elementary Gas Turbines—inspection and nondestructive testing, construction.

AVGT 1114 Systems and Overhaul Procedures—manufacturing and repair techniques, engine performance and testing, adjustments and troubleshooting, inspection procedures and techniques.

AVGT 1115 Specific Engines—specific engine type courses, 5 days each
- Allison 250-C20
- PT6 and ST6
- Pratt and Whitney JT8D
- General Electric CF6.

Program Length
21 weeks (30 hours/week) full-time.
Term 1: 8 weeks full-time
Term 2: 8 weeks full-time
Term 3: 5 weeks full-time

Normal Course Hours
0800-1500, Monday through Friday.

Total Fees (subject to change—may not include book or equipment costs)
$609 for the 21-week program (1993/94).

Prerequisites
High School graduation with Math 11. Physics 11 recommended. Communications 12 is acceptable in place of English 12. An interview may be required as part of the admissions process. Consideration may be given to mature students with appropriate work experience.

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Instructor
Peter Mills, A.M.E.

HEAVY DUTY MECHANIC

Certificate Program

The heavy duty mechanic repairs and tests heavy duty machines: tractors, crawlers, loaders, graders, cranes, shovels and trucks. The work ranges from simple daily maintenance checks to servicing hydraulic systems, air brakes and winches, blades and accessories.

Today's heavy duty mechanic not only knows how to use service manuals, tools and equipment to the best advantage, but also employs logic and deductive reasoning in diagnosing and troubleshooting.

Job Opportunities

Training prepares students for entry-level employment as heavy duty mechanics. Upon successful completion of the program, students should seek employment as an apprentice. There are employment opportunities in the Lower Mainland and throughout B.C. The majority of graduates can expect to find work in the heavy duty field within a year of graduation. However, they may have to work at an unskilled job in the industry until an apprenticeship becomes available.

The Program

Basic theory and related information along with hands-on shop practice enable students to become competent in basic heavy duty mechanical maintenance and repair.

Heavy duty mechanics must have a valid driver's license. Good physical condition is desirable. Potential students with medical or physical difficulties should contact Student Services to arrange an interview (telephone interview if out of town) with the Institute's Special Needs Counsellor, (604) 434-3304.

Program Content

Describe mechanical trades
Solve mathematical problems
Describe and use safe work practices
Technical communications
Apply science concepts
Electrical principles and practice
Start, run, move, and shut down selected equipment
Describe and use mechanic's hand and measuring tools
Describe and use mechanic's power tools
Describe and service hydraulic systems
Oxyacetylene welding
Arc welding
Lifting and blocking
Describe and overhaul internal combustion engines
Describe and service engine support systems
Describe and service powertrains
Describe and service seals and bearings
Describe and service braking systems
Describe and service final drive systems
Describe and service track machine undercarriages
Describe and service track machine steering systems
Describe and service wheels, tires and rims
Describe and service working attachments
Service wheel machine steering and suspension
Prepare for employment

Program Length

30 weeks full-time.

Normal Course Hours

0700-1345, Monday through Friday.

Total Fees (subject to change—may not include book or equipment costs)

$1,050 for the 30-week program (1993/94).

Prerequisite

High School graduation or pre-test.

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Instructors

Don Eklof, I.D., Diesel Eng.I.P., H.D.I.P., Chief Instructor
Al Westfall, I.D., H.D.I.P., Com. Trans. T.Q.
Edward Wilk, I.D., H.D.I.P.
Len Arychuk, I.D., H.D.T.Q., Auto T.Q.

INBOARD/ OUTBOARD MECHANIC

Certificate Program

The inboard/outboard mechanic works primarily on gasoline engines in the marine pleasure craft industry. A mechanic must know all aspects of repair to outboard motors, inboard and inboard/outboard engines, and stern-drive units.

Mechanics will be required to do tune-ups and electrical troubleshooting, disassemble and overhaul complete units and/or components, make steering and shift adjustments, check gauges and instruments, and may install accessories such as radio-telephones and depth-sounders. Depending on the employer, a mechanic may need to be skilled in working with boat trailers as well as boats and boat rigging, and the maintenance and repair of outdrives, transmissions and engines.

Job Opportunities

Students are prepared for entry-level employment as inboard/outboard marine mechanics. Upon successful completion of the program, students should seek employment as an apprentice. Opportunities in this trade exist both in and out of town with dealers, marinas, fishing lodges and resorts. Most of these businesses are not unionized but apprenticeships are common in this trade. Experienced tradespeople who have not served a formal apprenticeship but can verify their employment may be eligible to write the Trades Qualification (T.Q.) examination.

Job placement of graduate students is high. The marine mechanic trade covers the province as well as the rest of the country and further comment from the marine trade at this time is that there is a shortage of qualified mechanics and the wages are increasing. There are always jobs for good mechanics.

The Program

Basic theory and related information along with hands-on shop practice enable students to become competent in basic inboard/outboard repair and maintenance.

Good physical condition is desirable. Potential students with medical or physical difficulties should contact Student Services to arrange an interview (telephone interview if out of town) with the Institute's Special Needs Counsellor, (604) 434-3304.

Program Content

Use safe work practices
Describe the mechanics trades
Solve mathematical problems
Maintain mechanics measuring and hand tools

Use power tools
Use fastenings and fittings
Use materials
Use basic measuring, layout and hand tools
Lift loads
Oxyacetylene welding
Process technical information
Basic electricity
Disassemble and reassemble selected engines
Service outboard engines
Service outboard engine support systems
Service marine electrical systems
Service outboard gear cases
Service remote control systems
Boat rigging
Service inboard engines
Service inboard engine support systems
Service inboard propulsion systems
Describe and service outdrives
Service tilt and trim systems
Inboard/outboard installation and test running
Outboard installation and test running
Prepare for employment

Program Length
36 weeks full-time beginning the first Monday of the month, throughout the year, as required.

Normal Course Hours
0700-1400, Monday through Friday.

Total Fees (subject to change—may not include book or equipment costs)
$1,224 for the 36-week program (1993/94).

Prerequisite
High School graduation or pre-test.

BCIT presently has agreements with a number of School Districts throughout the province which give special status to Career Preparation graduates. A limited number of seats are available for Career Preparation graduates entering directly from secondary school. To gain preferential entry, students must meet the above prerequisites, complete a related Career Preparation Program, have good grades in Math 11 and English 12, and be successful in the interview process. For additional information see your high school counsellor, Technical Education teacher, or call BCIT Student Services at 434-3304, or 1-800-667-0676 for enquiries from outside the Greater Vancouver area.

Instructors
Kenneth Nichol, I.D., T.Q.
Jeff Mica, T.Q.

INDUSTRIAL MAINTENANCE MECHANIC

Cooperative Certificate Program

Industrial Maintenance Mechanics are responsible for the maintenance and repair of a wide variety of industrial equipment.

Job Opportunities
Opportunities exist throughout the Province in a variety of manufacturing plants from the food industry to machine building and maintenance and small service shops. Graduates may want to explore the prospects of an apprenticeship in either the millwright or machinist trades.

Program Content
Use safe working practices
Describe industrial maintenance mechanic occupation
Describe industrial, business and labor organizations
Solve mathematical problems and use the Machinery's Handbook
Solve science concepts
Sketch and read drawings
Communicate in the workplace
Use layout tools, hand tools, and fasteners
Lift loads
Select lubricants
Use power metal working tools and shop equipment
Use measuring tools
Use support machines
Use precision grinders
Use lathes
Use shapers, planers and slotters
Use milling machines
Complete a machine shop project
Solve basic gearing problems
Distinguish between properties in materials and their uses
Use arc welding and oxyacetylene equipment
Identify ferrous metals
Heat treat steel
Identify and test electrical equipment
Apply principles of fitting and assembling
Use steel fabrication hand tools, power tools and shop equipment
Install power drives
Perform machine installation
Describe material handling equipment
Describe, test and troubleshoot hydraulic components and systems
Describe the use of computers in industry
Describe preventive maintenance procedures
Prepare for employment

Cooperative Programs
This is a Cooperative Education Program which combines academic terms with paid cooperative work terms. Cooperative Education is not an option but an integral part of this program, subject to the same successful performance criteria of the program itself. While Coop Coordinators find the majority as job placements for students, it must be recognized that during certain periods of the business cycle, job placements may be hard to find. It is then the responsibility of the student to work with the Coordinator (and indeed on his/her own) to find a meaningful work experience. For more information see page 14. The complete Cooperative Education policy including student, institute and employer responsibilities is available through the Cooperative Education Office and the Registrar's Office.

Coop Coordinator: Gino Simeoni 432-8291
General Enquiries: 432-8634
The Cooperative Education Office is located in Building NW 2.6.

Program Length
80 weeks full-time consisting of 3, 16-week terms combined with 2 coop work terms: one 16 weeks and one 9 weeks.

Normal Course Hours
0730-1400, Monday through Friday.

Total Fees (subject to change—may not include book or equipment costs)
$1,872 for the 80-week program (1993/94).

Prerequisites
High School graduation with mechanical electives **or** pre-test **or** individual assessment by the department.

Good physical condition is desirable. Potential students with medical or physical difficulties should contact Student Services to arrange an interview (telephone interview if out of town) with the Institute's Special Needs Counsellor, (604) 434-3304.

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Instructor
Owen Collings, I.D., Machinist T.Q., Millwright T.Q.

IRONWORKING

Certificate Program

Structural ironworkers raise structural steel girders, plates and columns, and join them permanently to form a framework or a completed structure. Work is usually broken down into various phases with separate crews, such as the raising gang or the high tensile bolt gang. The workers are usually interchangeable on all phases of work except welding, an activity which requires additional training. Workers with the crew are usually designated according to the work they do: bolter-up, connector, hooker-on or rigger, rod man, sheeter and curtain wall.

Job Opportunities

Training prepares students for entry-level employment in the ironworking trade. Upon successful completion of the program, students should seek employment as an apprentice. With the present level of industrial and commercial construction, job opportunities exist in both the structural steel and reinforced concrete sectors of the construction industry.

The Program

Basic theory and related information along with hands-on shop and field practice enable students to become competent in basic ironworking activities.

Ironworkers must be able to work at heights and in adverse weather. Good physical condition is desirable. Potential students should arrange an interview with Ironworker Instructor at (604) 432-8203.

Program Content

Apply safe and acceptable work practices
Mathematics
Sketch and read drawings
Prepare for employment
Use basic measuring, layout and hand tools
Use metal fabrication power tools
Metallurgy fundamentals
Use oxyacetylene and fit structural shapes
Perform arc welding
Apply rigging
Use cranes and derricks
Perform structural steel erection
Select reinforcing steel

Program Length

23 weeks full-time.

Normal Course Hours

0700-1345, Monday through Friday.

Total Fees (subject to change—may not include book or equipment costs)

$847 for the 23-week program (1993/94).

Prerequisite

Grade 10 or pre-test.

Instructors

Nino Romanin
Jim King

JOINERY (CABINETMAKER)

Certificate Program

A joiner works in a wide range of specialties such as cabinetmaking, furniture making, pattern making, store fixture manufacturing and millwork. The type of work in each of these areas varies. In some shops the joiner will be a machine operator, feeding components in at one end and/or extracting them at the other. In other shops the joiner will be required to read detailed blueprints and visualize the item to be built, lay out and compile a cutting bill, cut and machine all the components, and then assemble the final product.

The joiner must be familiar with all the machinery in the shop and be able to set up, use and maintain this machinery. Any hardware items such as hinges, locks or drawer slides specified in the blueprints must be considered during fabrication. The joiner not only installs these items, but also ensures that the units will accept each particular hardware.

Training prepares students for entry-level employment in the joinery trade. Basic theory and related information along with hands-on shop practice enable students to become competent in basic interior woodworking tasks. Upon successful completion of the program, students should seek employment as an apprentice.

Job Opportunities

Employment opportunities vary with the shop size, location and type of work produced. Shops range from small custom shops to large production shops, with the large shops generally located in areas of denser population. Type of work may include but is not limited to: millwork, cabinetmaking, furniture manufacturing, boatbuilding and door, window and stairbuilding.

Program Content

Use safe work practices
Solve mathematical problems
Sketch and read drawings, use layout procedures
Care and use of hand tools
Care and use of portable power tools
Care and use of shop equipment
Identify and use materials
Use specialty tools
Floor and wall framing (theory)
Interior and exterior finishing (theory)
Cabinets and finishes
Prepare for employment

Program Length

28 weeks full-time.

Normal Course Hours

0730-1415, Monday through Friday.

Total Fees (subject to change—may not include book or equipment costs)

$936 for the 28-week program (1993/94).

Prerequisite

Grade 10 or pre-test.

Good physical condition is desirable. Potential students with medical or physical difficulties should contact Student Services to arrange an interview (telephone interview if out of town) with the Institute's Special Needs Counsellor, (604) 434-3304.

BCIT presently has agreements with a number of School Districts throughout the province which give special status to Career Preparation graduates. A limited number of seats are available for Career Preparation graduates entering directly from secondary school. To gain preferential entry, students must meet the above prerequisites, complete a related Career Preparation Program, have good grades in Math 11 and English 12, and be successful in the interview process. For additional information see your high school counsellor, Technical Education teacher, or call BCIT Student Services at 434-3304, or 1-800-667-0676 for enquiries from outside the Greater Vancouver area.

Instructors

Carl Catt, T.Q.
Ron Hill, T.Q.
Rob Sawatzky, B.Ed.
Dave Stimson, T.Q.
Erwin Bublitz, T.Q., Chief Instructor

MACHINIST

Certificate Program

The machinist makes and repairs metal parts, tools and machines, including custom work such as line boring pump castings and operating semi-automatic equipment on long production runs. General machinists use lathes, drill presses and milling machines to shape metal. Higher level work includes programming and operating computer controlled machine tools.

Job Opportunities

Training prepares students for entry-level employment in the machinist trade. Upon successful completion of the program, students should seek employment as an apprentice. Opportunities exist throughout the province. Formal apprenticeships are common in this trade, but a graduate should be prepared to take an entry level job in a shop until an apprenticeship becomes available.

The Program

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.

Good physical condition is desirable. Potential students with medical or physical difficulties should contact Student Services to arrange an interview (telephone interview if out of town) with the Institute's Special Needs Counsellor, (604) 434-3304.

Program Content

Apply safe working practices
Solve mathematical problems and use Machinery's Handbook
Read and interpret shop drawings
Use layout, measuring and testing tools and equipment
Use support machines
Identify common metals
Use lathes
Use shapers, planers and slotters
Use vertical and horizontal milling machines
Apply heat treatment
Use precision grinders
Oxyacetylene cut and weld
Fit bearings, seals, gaskets and packing
Select lubricants for specific applications
Describe the fundamentals of NC and CNC
Complete machine shop projects
Prepare for employment

Program Length

34 weeks full-time.

Course Hours

0700-1400 (first shift) or 1230-1915 (second shift), Monday through Friday.

Total Fees (subject to change—may not include book or equipment costs)

$1,166 for the 34-week program (1993/94).

Prerequisite

High School graduation or pre-test.

BCIT presently has agreements with a number of School Districts throughout the province which give special status to Career Preparation graduates. A limited number of seats are available for Career Preparation graduates entering directly from secondary school. To gain preferential entry, students must meet the above prerequisites, complete a related Career Preparation Program, have good grades in Math 11 and English 12, and be successful in the interview process. For additional information see your high school counsellor, Technical Education teacher, or call BCIT Student Services at 434-3304, or 1-800-667-0676 for enquiries from outside the Greater Vancouver area.

Instructors

Greg Burke, I.P., B.Ed.
Don Grant, I.D., T.Q.
Ted Marchant, I.D., T.Q., I.P., Chief Instructor
John Spencer, I.D., City & Guilds Machinist T.Q.
Pat Thomas, I.D., Machinist I.P., Electronics Tech.T.Q.
Fred Shim, Machinist I.P., Mech. Tech.
Brian Weir, Machinist I.P.
Terry Wadd, Machinist T.Q., Mach-Fitter

MILLWRIGHT

Certificate Program

Millwrights are often described as masters of all trades as they are expected to install, maintain and repair all types of machinery in almost any industry.

Job Opportunities

The potential for entry into a Millwright apprenticeship is good at this time. The expertise gained in this entry-level course is suitable for application to other trades and almost all industries. A graduate from this course should expect entry level employment until an apprenticeship becomes available.

Anywhere that machinery exists there is usually work for a millwright. Employment for millwrights is mainly centred on the major B.C. industries: mining, pulp mills, wood processing and petro-chemical plants, with smaller groups being employed in the manufacturing field. The construction industry also employs millwrights on short and long-term contracts.

The Program

Training prepares 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.

Good physical condition is desirable. Potential students with medical or physical difficulties should contact Student Services to arrange an interview (telephone interview if out of town) with the Institute's Special Needs Counsellor, (604) 434-3304.

Program Content

Use safe work practices
Process technical information
Solve mathematical problems
Physics
Identify common materials
Sketch and read drawings
Use basic measuring, layout and hand tools
Use fastenings and fittings
Use support machines
Shafts, hubs and keys
Bearings
Seals and packings
Lubrication
Power drives
Millwright shop equipment
Fitting and assembly
Riggings, ladders and scaffolds
Fluid power
Pneumatic systems
Material handling systems
Welding and cutting
Machinery installation and alignment
Machine shop equipment
Business organization and preparation for employment

Program Length
39 weeks full-time.

Normal Course Hours
0730-1400, Monday through Friday.

Total Fees (subject to change—may not include book or equipment costs)
$1,311 for the 39-week program (1993/94).

Prerequisite
High School graduation or pre-test.

BCIT presently has agreements with a number of School Districts throughout the province which give special status to Career Preparation graduates. A limited number of seats are available for Career Preparation graduates entering directly from secondary school. To gain preferential entry, students must meet the above prerequisites, complete a related Career Preparation Program, have good grades in Math 11 and English 12, and be successful in the interview process. For additional information see your high school counsellor, Technical Education teacher, or call BCIT Student Services at 434-3304, or 1-800-667-0676 for enquiries from outside the Greater Vancouver area.

Instructor
Ross Grigsby

MOTORCYCLE MECHANIC

Certificate Program

Motorcycle mechanics are involved with all aspects of motorcycle, ATV, and related equipment service and repair. They are required to perform operations such as new unit assembly and full service, top end and transmission/crankshaft rebuilds, electrical component repair and chassis, wheel, suspension, final drive and accessory service.

Job Opportunities
Training prepares students for entry-level employment as motorcycle mechanics.

The industry demands qualified technicians due to the increasing sophistication of the equipment. Most positions for graduates are as mechanics in service departments at franchised motorcycle dealers. Graduate students have proven to be valued employees. Many progress to service management positions. Some are involved in their own service and repair businesses. Upon successful completion of the course, students should seek employment as an apprentice.

The Program
Basic theory and related information along with hands-on shop practice will enable students to work in the motorcycle service industry.

Applicants cannot be allergic to solvents. Good physical condition is desirable. Potential students with medical or physical difficulties should contact Student Services to arrange an interview (telephone interview if out of town) with the Institute's Special Needs Counsellor, (604) 434-3304.

Program Content
Math and science
Process technical information
Basic measuring, hand, and power tools
Fasteners, fittings and materials
Oxyacetylene welding
Seal, gasket and bearing design and service
Two and four-cycle top end theory and design
Two and four-cycle top end service and rebuilding
Lubrication systems
Clutches, power transmissions, and crankshafts
Fuel delivery systems
Basic electricity and electrical systems
Ignition and charging systems
Brake systems
Final drives
Wheels and tires
Frames and suspensions
Perform selected service procedures
Prepare for employment

Program Length
34 weeks full-time beginning the first Monday of the month throughout the year, as required.

Normal Course Hours
0700-1400, Monday through Friday.

Total Fees (subject to change—may not include book or equipment costs)
$1,166 for the 34-week program (1993/94).

Prerequisite
High School graduation or pre-test.

BCIT presently has agreements with a number of School Districts throughout the province which give special status to Career Preparation graduates. A limited number of seats are available for Career Preparation graduates entering directly from secondary school. To gain preferential entry, students must meet the above prerequisites, complete a related Career Preparation Program, have good grades in Math 11 and English 12, and be successful in the interview process. For additional information see your high school counsellor, Technical Education teacher, or call BCIT Student Services at 434-3304, or 1-800-667-0676 for enquiries from outside the Greater Vancouver area.

Instructor
Tom Nelson, Dipl. Tech., T.Q.

PAINTING AND DECORATING

Certificate Program

Painters and decorators work in a wide range of specialties. Residential, commercial, industrial and production/manufacturing facilities provide a variety of employment opportunities.

Job Opportunities

In some shops, painters will work on residential and commercial housing; other shops will have a factory environment where the painter must have good mechanical aptitude and be able to run expensive, very complicated machinery. Some industrial shops need painters who can be trained for large painting projects: pulp and paper mills, ships, bridges,tanks,etc. Cities and municipalities throughout B.C. and Canada employ painters.

Starting wages for first-year apprentices and production painters average $10-$12/hour. Once journeyed certification is achieved, you can expect to earn $40 thousand plus/annum in this trade.

The Program

Training prepares students for entry-level employment in the Painting and Decorating trade. The program provides basic theory and related information together with a large amount of hands-on, practical experience. Upon successful completion of the program, students can work towards journeyed status in the trade by seeking employment as an apprentice or in another similar area.

Good physical condition is desirable. You cannot be allergic to paints and thinners. Potential students with medical or physical difficulties should contact Student Services to arrange an interview (by telephone if out-of-town) with the Institute's Special Needs Counsellor. Tel. (604) 434-3304.

Program Content

General safety
Basic tools and equipment
Ladders and scaffolding
Basic paint technology
Color mixing
Surface preparation
Coating procedures and application
Paint failure
Conventional spray finishing
Airless spray finishing
Decorative painting
Trade math and estimating
Preparation for employment

Program Length

20 weeks full-time.

Normal Course Hours

0730-1430, Monday through Friday.

Total Fees (subject to change—may not include book or equipment costs)

$580 for the 20-week program (1993/94).

Prerequisite

Grade 10 or pre-test.

Instructor

David A. Lick

PLUMBING

Certificate Program

Plumbers work with domestic hot and cold water, drainage waste and vent systems, hot water heating systems, sewage disposal systems and septic tanks. Many plumbers hold gas tickets because of the widespread use of natural gas in B.C.

All plumbing work in Canada is closely regulated. Accordingly, plumbers must become familiar with the National Building Code, the B.C. Plumbing Code and municipal by-laws and amendments.

Job Opportunities

The employment outlook for graduates in the piping/plumbing trades is very good.

The Program

Students are prepared for entry-level employment in the plumbing trade. Basic theory and related information along with hands-on shop practice enable students to become competent in basic plumbing tasks.Upon successful completion of the program, students should seek employment as an apprentice.

Plumbers must be able to work at heights and in enclosed spaces. Good physical condition is desirable. Potential students with medical or physical difficulties should contact Student Services to arrange an interview (telephone interview if out of town) with the Institute's Special Needs Counsellor, (604) 434-3304.

Program Content

Use safe work practices
Solve related math problems
Solve related science problems
Use piping hand tools
Use specialized power tools
Use piping equipment
Use fasteners and fittings
Use measuring tools and hand tools
Describe the piping trades
Select common piping materials
Install valves, fittings, hangers, supports and sleeving
Rigging and scaffold
Use oxyacetylene equipment
Read and sketch basic drawings
Construct piping systems projects
Select common plumbing materials
Install and test low temperature hot water heating systems
Layout and design piping drawings
Maintain plumbing systems and components
Install and test a drainage, waste and venting system
Install and test a potable water supply system
Install standard plumbing fixtures
Prepare for employment

Program Length

28 weeks full-time.

Normal Course Hours
0730-1415, Monday through Friday.

Total Fees (subject to change—may not include book or equipment costs)
$1,050 for the 30-week program (1993/94).

Prerequisite
Grade 10 or pre-test.

BCIT presently has agreements with a number of School Districts throughout the province which give special status to Career Preparation graduates. A limited number of seats are available for Career Preparation graduates entering directly from secondary school. To gain preferential entry, students must meet the above prerequisites, complete a related Career Preparation Program, have good grades in Math 11 and English 12, and be successful in the interview process. For additional information see your high school counsellor, Technical Education teacher, or call BCIT Student Services at 434-3304, or 1-800-667-0676 for enquiries from outside the Greater Vancouver area.

Instructors
John Masse, Chief Instructor
David Bowles
James Endert
William Evans
Gary Norgard
Nick Potis
Bernie Koelzer
Dale Pfaff
Anne St. Eloi
Bill Bradbury
Tota Ram
Howard Rothenberg
Gary Clifford

POWER ENGINEERING: GENERAL PROGRAM

Certificate Program

This program provides sound practical and technical knowledge and skills to persons desiring to enter the power engineering field. After completing this program, graduates are prepared to write the B.C. Ministry of Municipal Affairs examination for an Interprovincial 4th Class Power Engineer's Certificate of Competency.

Job Opportunities
An analysis of five years of data shows that 70% of Power Engineering graduates were placed in a training related job within a few weeks of graduation. Average salaries reported by students were among the highest when compared to other occupational programs. Former graduates are presently employed by hospitals, chemical plants, oil refineries, breweries, pulp and paper plants, sawmills, schools and institutions.

Graduates of this program may be able to obtain employment as 4th Class Power Engineers in industry, and qualify for positions as operators and maintenance repairmen in oil refineries, chemical and refrigeration plants, and caretakers of large buildings with central heating and air conditioning systems.

The Program
The program is divided into two levels. Classroom activity consists of lectures, demonstrations, audiovisual presentations and exercises that provide practical working knowledge of power engineering. Power plant tours, extensive workshop and steam laboratory experience are provided to reinforce theoretical concepts, develop manual skills and familiarity with power engineering techniques.

Applicants should have a good command of oral and written English; sufficient physical strength and stamina to meet the demands of the work; good hearing, eyesight, normal color vision, manual dexterity, and hand/eye coordination. In addition, applicants should have good theoretical and practical mathematical and mechanical aptitude. Previous power generation experience and related training are assets. Potential students with medical or physical difficulties should contact Student Services to arrange an interview (telephone interview if out of town) with the Institute's Special Needs Counsellor, (604) 434-3304.

Program Content
Power plant training
Power plant drafting
General electricity
Power plant theory
Instrumentation
Power plant maintenance
General mathematics
Applied science and chemistry
Computer fundamentals

Program Length
40 weeks full-time.

Normal Course Hours
0800-1515, Monday through Friday.

Total Fees (subject to change—may not include book or equipment costs)
$1,160 for the 40-week program (1993/94).

Prerequisite
High School graduation or pre-test.

POWER ENGINEERING: TECHNICAL PROGRAM

Certificate Program *(first year of Diploma in Power Engineering)*

This program provides sound practical and technical knowledge and skills to persons desiring to enter the power engineering field. In addition, the program includes courses which provide graduates with the necessary technical background in applied mathematics and science to be eligible to enter the Power and Process Engineering program.

After completing the program, graduates are prepared to write the B.C. Ministry of Municipal Affairs examination for an Inter-provincial 4th class Power Engineer's Certificate of Competency.

Job Opportunities

An analysis of five years of data shows that 70% of Power Engineering graduates were placed in a training related job, within a few weeks of graduation. Average salaries reported by students were among the highest when compared to other occupational programs. Former graduates are presently employed by hospitals, chemical plants, oil refineries, breweries, pulp and paper plants, sawmills, schools and institutions.

Graduates may then be able to obtain employment as 4th Class Power Engineers in industry and be qualified for positions as operators and maintenance repairmen in oil refineries, chemical and refrigeration plants, and caretakers of large buildings with central heating and air conditioning systems.

The Program

The program is divided into two levels. Classroom activity consists of lectures, demonstrations, audiovisual presentations and exercises that provide a practical working knowledge of power engineering. Power plant tours and extensive workshop and steam laboratory experience are provided to reinforce theoretical concepts, develop manual skills, and become familiar with power engineering techniques. Applicants should have a good command of oral and written English; sufficient physical strength and stamina to meet the demands of the work; good hearing, eyesight, normal color vision, manual dexterity, and hand/eye coordination. In addition, applicants should have good theoretical and practical mathematical and mechanical aptitude. Previous power generation experience and related training are assets. Potential students with medical or physical difficulties should contact Student Services to arrange an interview (telephone interview if out of town) with the Institute's Special Needs Counsellor, (604) 434-3304.

Program Content

Power plant training
Power plant operations and systems
Technical electricity
Power plant theory
Instrumentation
Power plant maintenance
Technical mathematics
Applied physics
Industrial electronics

Program Length

40 weeks full-time.

Normal Course Hours

0800-1515, Monday through Friday.

Total Fees (subject to change—may not include book or equipment costs)

$1,160 for the 40-week program (1993/94).

Prerequisites

High School graduation including Math 12 and Physics 11 or pre-test.

POWER AND PROCESS ENGINEERING

(Diploma in Power Engineering) Diploma of Trades Training

This program provides sound practical and technical knowledge and skills to persons desiring advancement in the field of power engineering. After completing the program, graduates are prepared to write the B.C. Ministry of Municipal Affairs examination for an Interprovincial 3rd Class Power Engineer's Certificate of Competency.

Job Opportunities

An analysis of five years of data shows that 80% of Power Engineering graduates were placed in a training related job. usually within a few weeks of graduation. Average salaries reported by students were among the highest when compared to other occupational programs. Former graduates are presently employed by hospitals, chemical plants, oil refineries, breweries, pulp and paper plants, sawmills, thermal power stations, schools and institutions.

Graduates of this program may be able to obtain employment as 3rd Class Power Engineers and be qualified for positions of considerable responsibility in large industrial plants such as: pulp mills, saw mills, oil refineries, thermal power stations, refrigeration plants, breweries and hospitals.

The Program

The program is divided into two levels. Classroom activity consists of lectures, demonstrations, audiovisual presentations and exercises that provide practical working knowledge of power engineering. Plant tours, workshops, steam laboratory and troubleshooting exercises are provided to reinforce theoretical concepts, develop manual skills, and become familiar with additional power engineering techniques. Applicants should have a good command of oral and written English; sufficient physical strength and stamina to meet the demands of the work; good hearing, eyesight, normal color vision, manual dexterity, and hand/eye coordination. In addition, applicants should have good theoretical and practical mathematical and mechanical aptitude. Previous power generation experience and related training are assets. Potential students with medical or physical difficulties should contact Student Services to arrange an interview (telephone interview if out of town) with the Institute's Special Needs Counsellor, (604) 434-3304.

Program Content
Power plant theory
Technical communications
Thermal engineering
Technical electricity
Fluid mechanics
Metallurgy
Engineering mechanics
Plant management
Strength of materials
Distributed Control Systems
Power plant maintenance
Computer technology
H.V.A.C. Systems

Program Length
40 weeks full-time.

Normal Course Hours
0800-1515, Monday through Friday.

Total Fees (subject to change—may not include book or equipment costs)
$1,160 for the 40-week program (1993/94).

Prerequisites
a. A valid 4th Class Power Engineering certificate and
b. Successful completion of the Power Engineering Technical program, or successful completion of the first year of an engineering-related, post-secondary program at a technical institute or engineering faculty of a university.
or
c. Applicants who do not possess the above qualifications may request individual assessment by the Power Engineering Department.

Instructors
A. Barnard
J. Brown, Chief Instructor
R. Carviel
H. Doad, Coordinator, Full-time Programs
P. George, Coordinator, Upgrading and Correspondence
F. Hajer
A. Lees
H. Rink
R. Smith
G. White

SHEET METAL WORKING

Certificate Program

Sheet metal workers fabricate, assemble, alter and install a variety of sheet metal products. Typical jobs performed by a sheet metal worker include: air conditioning system ductwork, hospital and kitchen equipment (stainless steel), industrial exhaust systems, industrial sheet metal work, skylight work, roofing and flashing (copper, aluminum, stainless steel and galvanized iron).

Job Opportunities
Students are prepared for entry-level employment in the sheet metal industry. Upon successful completion of the program, students should seek employment as an apprentice.

With the continuing improvement in the construction industry in B.C., employment opportunities for sheet metal workers have greatly improved. Graduates are finding employment with both union and non-union employers. Apprenticeships are readily available. The bright employment picture in this trade is expected to continue for the next few years.

The Program
Basic theory and related information along with hands-on shop practice enable students to become competent in fabricating basic sheet metal products.

Sheet metal workers must be able to work at heights. Good physical condition is desirable. Potential students with medical or physical difficulties should contact Student Services to arrange an interview (telephone interview if out of town) with the Institute's Special Needs Counsellor, (604) 434-3304.

Program Content
Use safe work practices
Solve mathematical problems
Sketch and read drawings
Process technical information
Use basic measurement and layout tools
Use power tools and shop equipment
Lift and support loads
Oxyacetylene cut and weld
Use fasteners and fittings
Use materials
Make seams and edges
Apply riveting techniques
Use sheet metal hand operated machines
Develop patterns using parallel line development
Develop patterns using radial line development
Develop patterns using triangulation development
Construct a number of metal projects involving all of the above
Prepare for employment

Program Length
20 weeks full-time.

Normal Course Hours
0730-1415, Monday through Friday.

Total Fees (subject to change—may not include book or equipment costs)
$760 for the 20-week program (1993/94).

Prerequisite
Grade 10 or pre-test.

BCIT presently has agreements with a number of School Districts throughout the province which give special status to Career Preparation graduates. A limited number of seats are available for Career Preparation graduates entering directly from secondary school. To gain preferential entry, students must meet the above prerequisites, complete a related Career Preparation Program, have good grades in Math 11 and English 12, and be successful in the interview process. For additional information see your high school counsellor, Technical Education teacher, or call BCIT Student Services at 434-3304, or 1-800-667-0676 for enquiries from outside the Greater Vancouver area.

Instructors
Ted Kondo, T.Q., Sheet Metal I.D., Chief Instructor
Dave Stewart, T.Q., Sheet Metal I.D.
Gordon Torgerson, T.Q.

STEAMFITTING

Certificate Program

Steamfitters/pipefitters install, alter, maintain and repair piping systems which convey low and high pressure steam, hot water, air, fuel gases, fuel and finely divided solids. Steamfitters/pipefitters are employed in 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.

Job Opportunities

Training prepares students for entry-level employment as steamfitters/pipefitters. Upon successful completion of the program, students should seek employment as an apprentice. In this trade, opportunities are found in industrial plants, pulp and lumber mills, and commercial areas.

The Program

Basic theory and related information along with hands-on shop practice enable students to become competent in basic steamfitting/pipefitting tasks.

Steamfitters/pipefitters must be able to work at heights and in enclosed spaces. Good physical condition is desirable. Potential students with medical or physical difficulties should contact Student Services to arrange an interview (telephone interview if out of town) with the Institute's Special Needs Counsellor, (604) 434-3304.

Program Content

Use safe work practices
Solve related math problems
Solve related science problems
Use piping hand tools
Use specialized power tools
Use piping equipment
Use fasteners and fittings
Use measuring tools and hand tools
Describe the piping trades
Select common piping materials
Install valves, fittings, hangers, supports and sleeving
Rigging and scaffolds
Use oxyacetylene equipment
Read and sketch basic drawings
Construct piping systems projects
Install a selected pump
Install and test low temperature hot water heating systems
Layout and design piping drawings
Install a basic steam heating system
Install manufacturing fittings
Fabricate fittings
Prepare for employment

Length of Program

30 weeks full-time.

Normal Course Hours

0730-1415, Monday through Friday.

Total Fees (subject to change—may not include book or equipment costs)

$1,050 for the 30-week program (1993/94).

Prerequisite

Grade 10 or pre-test.

BCIT presently has agreements with a number of School Districts throughout the province which give special status to Career Preparation graduates. A limited number of seats are available for Career Preparation graduates entering directly from secondary school. To gain preferential entry, students must meet the above prerequisites, complete a related Career Preparation Program, have good grades in Math 11 and English 12, and be successful in the interview process. For additional information see your high school counsellor, Technical Education teacher, or call BCIT Student Services at 434-3304, or 1-800-667-0676 for enquiries from outside the Greater Vancouver area.

Instructors

John Masse, Chief Instructor
Bill Bradbury
Ron Marier
Bill Johnston
Anne St. Eloi

STEEL FABRICATING

Certificate Program

Steel fabricators deal with the selection, layout, shearing, cutting (with a torch), punching, drilling, forming, fitting and welding of steel plates and structural steel shapes into products for the forest, mining, construction, transportation and agricultural industries. Typical projects that involve steel fabricators include: bridges, buildings, hoppers, conveyors, towers, cranes, heavy mining equipment, logging equipment, ship parts and equipment.

Job Opportunities

Training prepares students for entry-level employment as steel fabricators. Upon successful completion of the program, students should seek employment as an apprentice.

The Program

Basic theory and related information along with hands-on shop practice enable students to become competent in basic steel fabrication methods for products such as steel buildings, tanks, and equipment.

Good hand/eye coordination and good physical condition are desirable. Potential students with medical or physical difficulties should contact Student Services to arrange an interview (telephone interview if out of town) with the Institute's Special Needs Counsellor, (604) 434-3304.

Program Content

Describe safe work practices
Solve mathematical problems
Sketch and read drawings
Erect ladders and scaffolds
Describe the properties of metals used in fabrication industry
Use common steel fabrication fasteners
Lift loads
Use steel fabrication hand tools
Use steel fabrication portable power tools
Clean and prepare metal surfaces
Read and interpret steel fabrication drawings
Describe patterns for shop fabrication
Make templates for shop construction
Use weld with oxyfuel equipment
Use arc welding equipment
Use steel fabrication shop equipment
Fabricate projects

Program Length

23 weeks full-time.

Normal Course Hours

0700-1345, Monday through Friday.

Total Fees (subject to change—may not include book or equipment costs)

$847 for the 23-week program (1993/94).

Prerequisite
Grade 10 or pre-test.

BCIT presently has agreements with a number of School Districts throughout the province which give special status to Career Preparation graduates. A limited number of seats are available for Career Preparation graduates entering directly from secondary school. To gain preferential entry, students must meet the above prerequisites, complete a related Career Preparation Program, have good grades in Math 11 and English 12, and be successful in the interview process. For additional information see your high school counsellor, Technical Education teacher, or call BCIT Student Services at 434-3304, or 1-800-667-0676 for enquiries from outside the Greater Vancouver area.

Instructors
Gary Blidook
Kevin Neustaedter
Terry Subtelny

TOOL AND DIE TECHNICIAN

Cooperative Diploma of Trades Training

This technician program will provide you with tool-making skills. A tool maker is required to operate all types of shop equipment such as lathes, grinders, milling machines and Computer Numerical Control machines. On completion, graduates will receive a technician diploma.

Job Opportunities
Graduates of the two-year Tool and Die Technician Program can look forward to an apprenticeship in machining, tool and die making or mold making, or a career in modern production processes: quality control, process planning, designing, estimating, or technical sales.

The Program
The student will require patience, deductive reasoning and above average academic and practical skills in the designing and building of tools, dies, molds and special machinery.

Cooperative Programs
This is a Cooperative Education Program which combines academic terms with paid cooperative work terms. Cooperative Education is not an option but an integral part of this program, subject to the same successful performance criteria as the program itself. While Coop Coordinators find the majority of job placements for students, it must be recognized that during certain periods of the business cycle, job placements may be hard to find. It is then the responsibility of the student to work with the Coordinator (and indeed on his/her own) to find a meaningful work experience. For more information see page 14. The complete Cooperative Education policy including student, institute and employer responsibilities is available through the Cooperative Education Office and the Registrar's Office.

Coop Coordinator: Gino Simeoni 432-8291
General Enquiries: 432-8634
The Cooperative Education Office is located in Building NW 2.6.

Program Content
Tool and die machining
Mathematics
Metallurgy
Mechanics
Tool design
Blueprint reading and drafting
Manufacturing processes
Materials and processes
Computer Numerical Control (CNC)
Electrical discharge machining
Technical communication
Industry work terms

Program Length
100 weeks full-time.
Level 1—40 weeks
Level 2—40 weeks
Level 3—20 weeks

Course Hours
0700-1400, Monday through Friday.

Total Fees (subject to change—may not include book or equipment costs)
$2,340 for the 100-week program (1993/94).

Prerequisites
a. High School graduation with mechanical electives and a successful interview by the department;
   or
b. Pass on entrance test measuring math and reading skills and a successful interview by the department.

BCIT presently has agreements with a number of School Districts throughout the province which give special status to Career Preparation graduates. A limited number of seats are available for Career Preparation graduates entering directly from secondary school. To gain preferential entry, students must meet the above prerequisites, complete a related Career Preparation Program, have good grades in Math 11 and English 12, and be successful in the interview process. For additional information see your high school counsellor, Technical Education teacher, or call BCIT Student Services at 434-3304, or 1-800-667-0676 for enquiries from outside the Greater Vancouver area.

Instructors
George Ainslie, I.D./Machinist, I.P., Tool & Die T.Q.
Tony Hurley, I.D., Machinist T.Q., Instrument Maker

WELDING

Provincial Welder Certificate Program

The Programs

The three welding programs, (Levels 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 Advanced Education, Training and Technology. Welding programs are available on three shifts.

1st shift: 0700-1330
2nd shift: 1300-1930
3rd shift: 1530-2200

Job Opportunities

Nearly every industry 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.

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

Program Length

30 weeks full-time.

Normal Course Hours

0700-1330 or 1300—1930, Monday through Friday.

Total Fees (subject to change—may not include book or equipment costs)

$870 for the 30-week program (1993/94).

Prerequisite

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

BCIT presently has agreements with a number of School Districts throughout the province which give special status to Career Preparation graduates. A limited number of seats are available for Career Preparation graduates entering directly from secondary school. To gain preferential entry, students must meet the above prerequisites, complete a related Career Preparation Program, have good grades in Math 11 and English 12, and be successful in the interview process. For additional information see your high school counsellor, Technical Education teacher, or call BCIT Student Services at 434-3304, or 1-800-667-0676 for enquiries from outside the Greater Vancouver area.

LEVEL B PROGRAM

This program develops more advanced welding skills and related theory than were taught in the Level C program: pipe welding, gas tungsten arc welding, 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)
P8 Gas metal arc welding 2 (GMAW 2)
P9 Flux cored arc welding 2 (FCAW 2)
P10 Gas tungsten arc welding (GTAW 1)
RK4 Welding quality control and inspection procedures
RK5 Welding code standards and specifications
RK6 Blueprint reading 2
RK7 Welding metallurgy 2

Program Length

Up to 16 weeks depending on modules required.

Prerequisites

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.

LEVEL A PROGRAM

This program develops more advanced welding skills and related theory than were taught in the level C and B programs: pipe welding with stainless steel electrodes, low alloy 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 the diverse metal joining industries.

Level A Modules/Courses

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

Program Length

Approximately 8 weeks depending on number of modules required.

Prerequisites

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.

SHORT-TERM PART PROGRAMS AND UPGRADING OPTIONS (OR C, B, A OPTIONS)

This program of training and testing options will 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 the welding code governing agencies.

Content

Level C, B and A performance challenge tests**
Canadian Welding Bureau (CWB) procedural tests*
A.S.M.E.—M.A.E.T.T. pre-qualified 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 (see the modules listed under the Level C,B and A Programs) of the B.C. registered welder training programs.

* A letter of approval for welding test may be required for company/union welding tests
** A letter of approval is also required from the Apprenticeship Training Branch for level C, B and A challenge performance tests.

Part Programs vary according to individual requirements and upgrade option goals.

Part Program/Short-term Welding Upgrade (or C, B, A 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.

Welding Applied Processes

Training in the following processes is available by request. All enquiries should be directed to the Welding Department office for course costs and dates.

Submerged Arc Welding

Automated welding systems
GTAW of titanium alloys
Downhill pipeline

Part-time Courses

A number of introductory courses in welding are available through the Part-time Studies Department. Credit transfer from these courses can be arranged when enrolling in Welding Upgrade Options.

Instructors

Larry Cox, Chief Instructor
C. Bishop
Don Becker
Brian Finnie
C. Grass
Elif Iverson
George Jones
Don McRae
Kerry Nielson
Al Pasichnyk
Eric Sukkel
Eric Waterfield
Al Wood

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