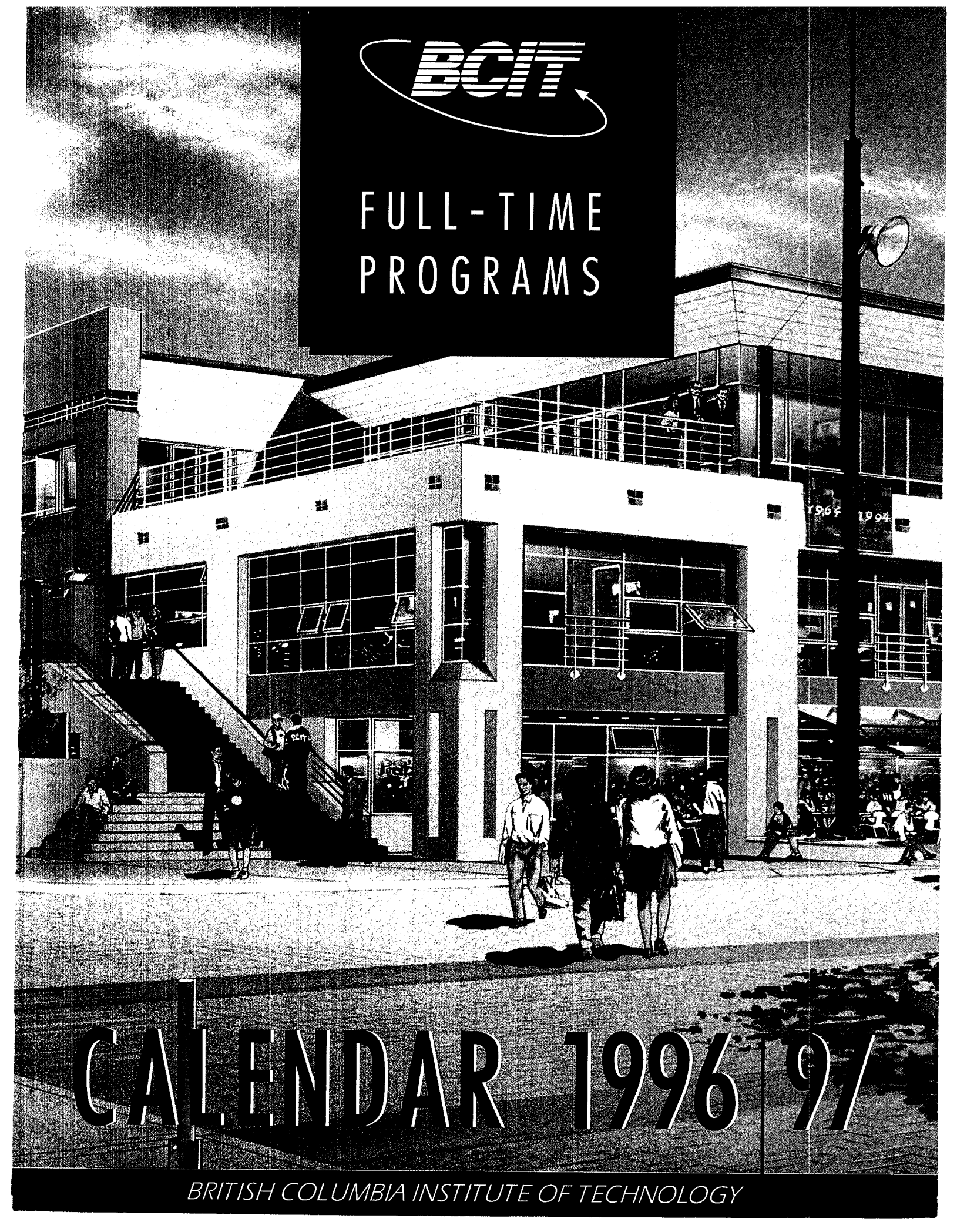
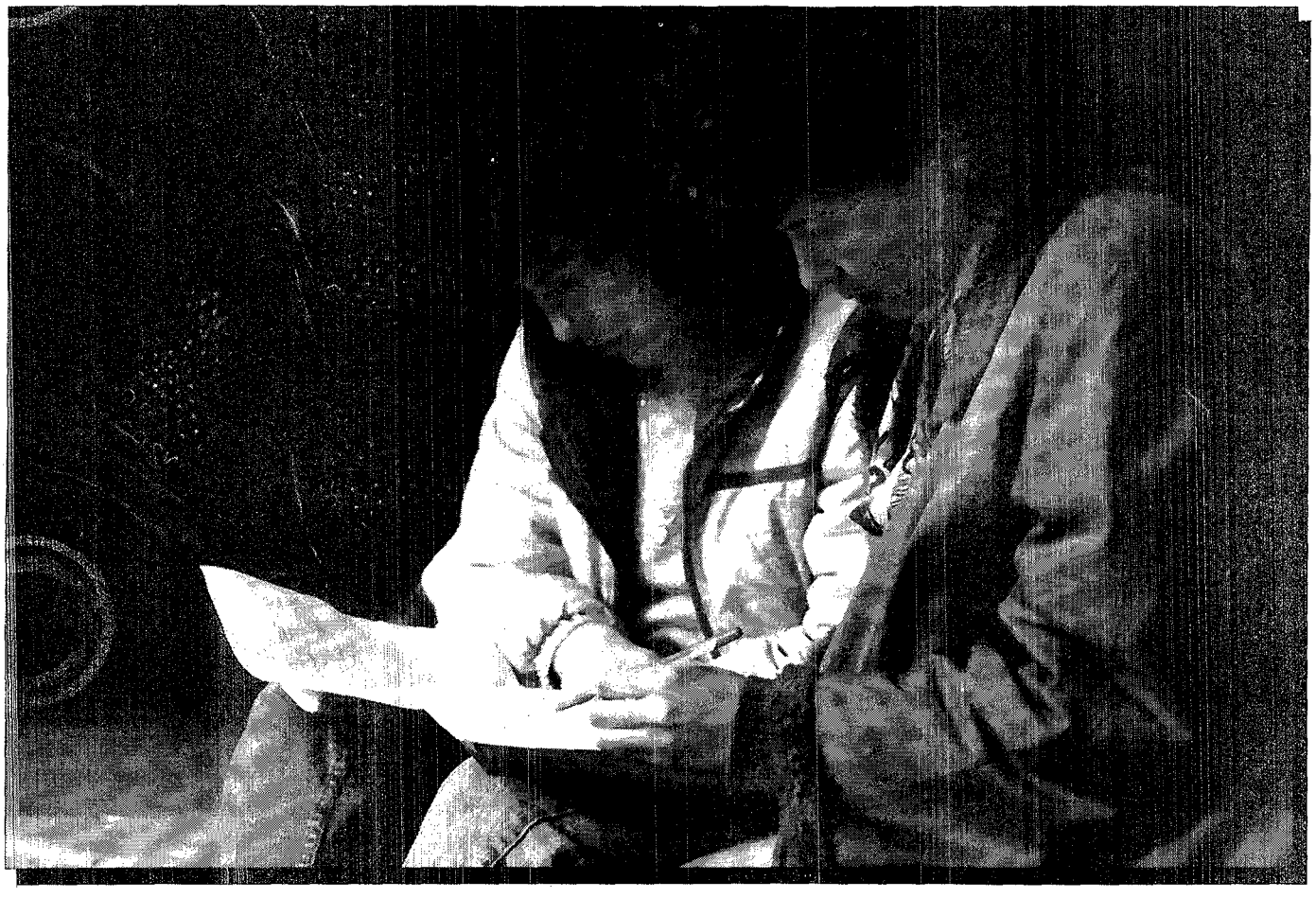

BCIT
FULL-TIME
PROGRAMS
CALENDAR 1996 97
BRITISH COLUMBIA INSTITUTE OF TECHNOLOGY

THE BCIT MANDATE

BCIT will be a province-wide, innovative organization, specializing in advanced technology training and focusing on those initiatives that increase the level of economic activity, entrepreneurial activity and employment for the province. BCIT will:

- prepare dynamic, highly skilled members of the workforce by delivering full and part-time courses of study including:
  — certificate, diploma and degree studies in technologies and trades;
  — contracted industry training and upgrading courses.
- conduct technology transfer activities by providing opportunities for innovation, industrial assistance and contracted applied research.



THE BCIT MISSION

The Mission of BCIT is to provide British Columbians with world-class, job-ready skills for career success.

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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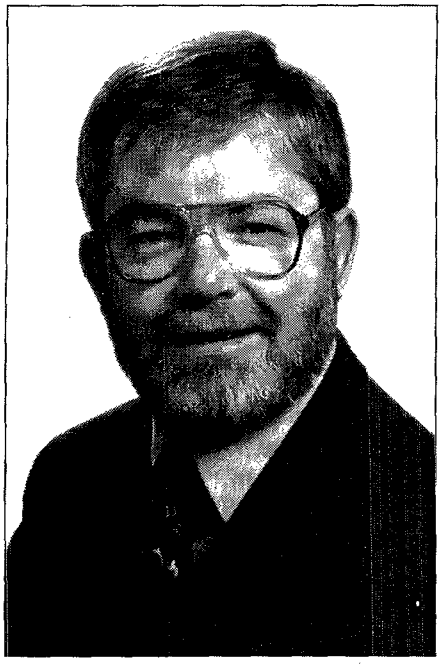
FRONT COVER: Architect's rendering of the new Student Association Campus Centre



MESSAGE FROM THE PRESIDENT

At BCIT, our continuing challenge to educate and train the best job-ready, technology and trades graduates in the world is being met head-on as we continue to bridge the gap between industry and post-secondary education.

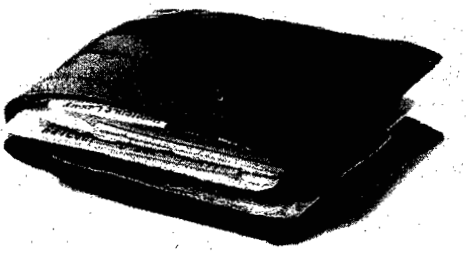
As you explore this calendar you will read about career-entry programs that provide our graduates with a foundation for lifelong learning. While at BCIT, students study towards important credentials that are the qualification of choice of their future employer.

Our instructors know first-hand the challenges and opportunities of the workplace and they possess a clear understanding of industry's expectations for our students. As a result, the instructors recognize what our students need to graduate with in terms of employable skills and knowledge.

The members of the BCIT community are committed to ensuring that your education and training is equally challenging and rewarding. I wish you every success in your studies.

Brian Gillespie
President

Is your wallet lighter than your term paper?



At Bank of Montreal, we're committed to helping you through your education. That's why we've designed a number of special Student Services* adapted to your needs:

How to pass school without failing finance

- ✔ Special student loans of **up to $5,000** – with low rates, interest only while in school, and more.
- ✔ **Discount** for students on day-to-day banking with our Student Plan – unlimited cheques and withdrawals, unlimited use of Instabank® machines and **more**, for one low monthly fee of $2.75!
- ✔ **No Fee** MasterCard® card.

Visit one of our branches near you:

Burnaby Main	665-6639
Metrotown Centre	665-3779
Brentwood Branch	665-6660
Grandview & Rupert	665-2514
Rumble & Royal Oak	665-6691
Willingdon & Hastings	665-2520
Lougheed Mall	665-3745

* Available to full-time students. Ask your branch for details.
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Bank of Montreal

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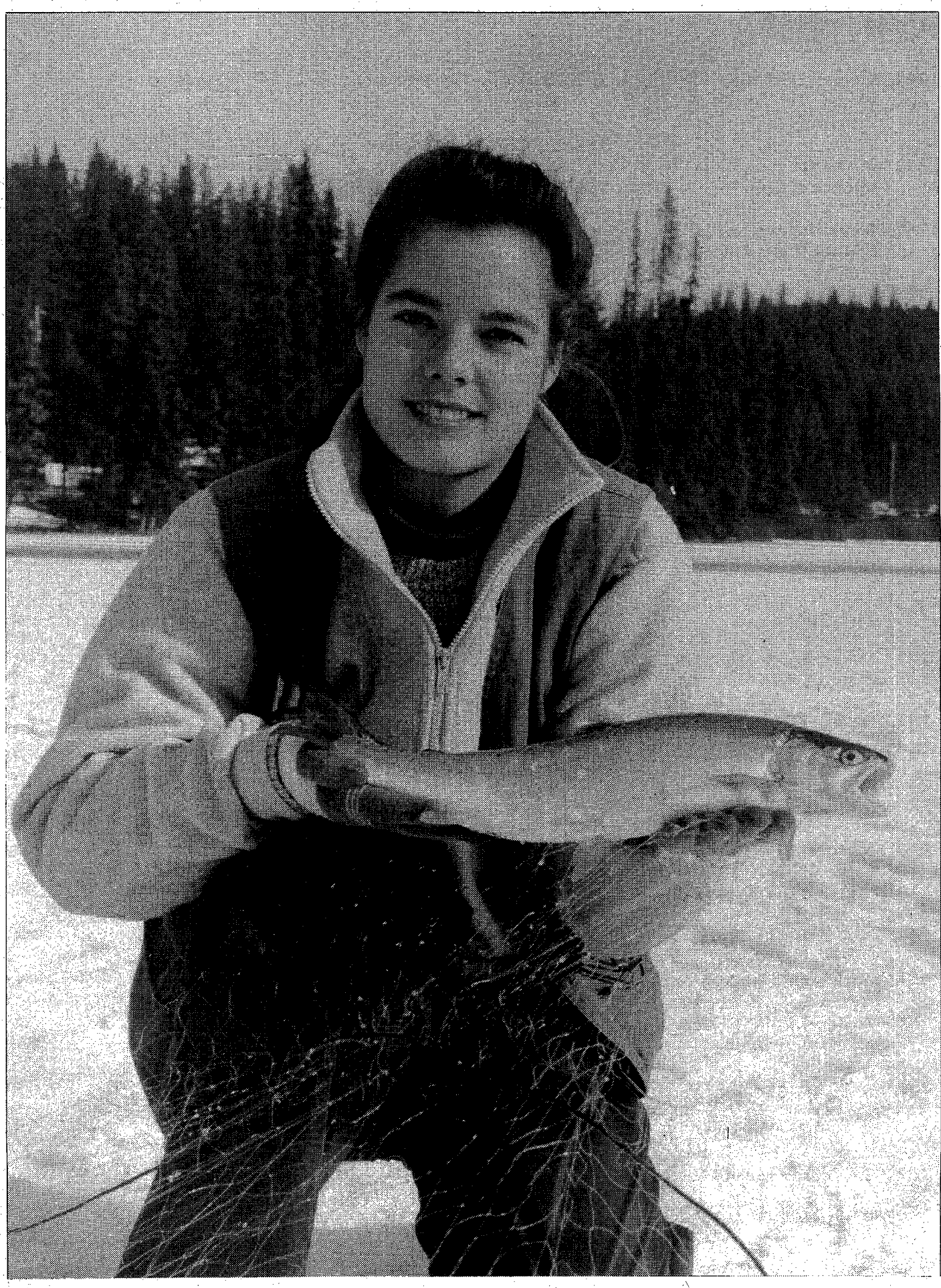

GENERAL INFORMATION

CLASS LOCATIONS/ OFFICE HOURS

Please note: Health Part-time Studies (Kaslo campus) has relocated to the Burnaby campus.

1. BURNABY, MAIN CAMPUS

(604) 434-5734
3700 Willingdon Avenue
Burnaby, B.C. Canada
V5G 3H2

Full-time and Part-time courses and programs

Admission, Full-time programs:	(604) 432-8419
Application Forms/ Program Information:	(604) 434-3304
Registration, Part-time:	(604) 434-1610
Registration, Fax:	(604) 687-2488
or	(604) 430-1331
Student Records:	(604) 432-8498
Refunds:	(604) 432-8212
Payments:	(604) 434-8732

Office Hours — Burnaby campus

Admissions/General Enquiries for Full-time Studies

Monday to Friday	0830-1300
	1400-1630
Saturday	Closed

Registration — General Enquiries for Part-time Studies

August 13, 1996 to April 26, 1997

Monday to Thursday	0830-1900
Friday	0830-1630
Saturday	0830-1230
Holiday weekends	Closed

April 28, 1997 to August 16, 1997

Monday to Friday	0830-1300
	1400-1630
Saturday	Closed

PLEASE NOTE: OFFICE HOURS FOR THE REGISTRATION DEPARTMENT ARE CURRENTLY UNDER REVIEW AND MAY BE SUBJECT TO CHANGE.

2. DOWNTOWN CAMPUS

(604) 687-4666
549 Howe Street
Vancouver, B.C.
V3C 2C6
Fax: (604) 687-2488

Office Hours

When school is in session:

Monday to Thursday	0830-1800
Friday	0830-1630

Otherwise

Monday to Thursday	0830-1730

Please note: BC Tel is changing its long distance calling system in B.C. as of September 1994. As of this date, callers will have to dial the area code for all long distance calls. For example, any long distance caller will have to dial 604 after dialing 1 or 0.

3. SEA ISLAND CAMPUS

(604) 278-4831
Vancouver International Airport
5301 Airport Road, South
Richmond, B.C.
V7B 1B5
Fax: (604) 278-5363
Full-time and part-time Aviation programs and courses only.

4. PACIFIC MARINE TRAINING CAMPUS

(604) 985-0622
265 West Esplanade
North Vancouver, B.C.
V7M 1A5
Fax: (604) 985-2862

THE 24-HOUR CLOCK

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

FREEDOM OF INFORMATION/ PROTECTION OF PRIVACY (FOI/POP)

The British Columbia Institute of Technology gathers and maintains information used for the purposes of admission, registration and other fundamental activities related to being a member of the BCIT community and attending a public post-secondary institution in the province of British Columbia. In signing an application for admission, all applicants are advised that the information they provide and any other information placed into the student record will be protected and used in compliance with the Freedom of Information and Protection of Privacy Act, SBC 1992.

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 either the Registration department or Student Records department 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 20. 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. 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.

GENERAL INFORMATION

HARASSMENT AND DISCRIMINATION POLICY

BCIT and its management, together with the unions and the Student Association, are committed to providing an environment where the individual differences of all students and employees are valued and respected — an environment free from harassment and discrimination.

The definitions

BCIT's Harassment and Discrimination Policy prohibits discrimination or harassment on the following grounds:
Race, colour, ancestry, place of origin, political belief, religion, marital or family status, sexual orientation, physical or mental disability, gender, age and unrelated conviction.

Harassment

Harassment is a form of illegal discrimination that can occur on any of the grounds mentioned above.

General Harassment

Unwelcome sexually oriented conduct including innuendo, offensive remarks, jokes or physical contact.

Personal Harassment

Misuse of authority or abuse of power by an individual or a group of individuals, intended to demean or intimidate.

Discrimination

Discrimination is the refusal to employ or continue to employ any person on the grounds described above. It also refers to the denial, on the above grounds, of employment opportunity that is customarily available to the public.

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 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 judgment 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 acceptable reason for being absent or late will result in the student having an "inexcused 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 (604) 432-8848. Also see section on Examinations, Grading and Marks, this calendar.

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.

GENERAL INFORMATION

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Catherine Daminato, B.Sc., M.B.A., Director of Development

OFFICE OF THE REGISTRAR

The Office of the Registrar is located in building SW1 on the second floor, room 2170

Staff

Val Karpinsky, B.A.(Hons.), Registrar
Karen Cresswell, B.Ed., Associate Registrar; Admissions
Cynthia Howman, Associate Registrar; Systems
Dawna Mackay, Systems Assistant
Lois Nightingale, Acting Projects Coordinator
Michelle Philippe, B.Sc., Dipl. T., Assistant

ADMISSIONS/REGISTRATION

The Admissions and Registration Departments are located in building SW1 on the first floor, room 1305

Full-time Admission/Status Information:	(604) 432-8419
Application Forms and Program/ Course Information:	(604) 434-3304
Part-time Registration:	(604) 434-1610
Registration Fax:	(604) 687-2488
or	(604) 430-1331

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.

Inquiries for program information, application forms and/or publication requests should be directed to Student Services at (604) 434-3304. Inquiries from outside the greater Vancouver area may use the toll-free number 1-800-667-0676.

Office hours are:

Admissions (Full-time Program Inquiries)

Monday to Friday	0830-1300
	1400-1630

Registration (Part-time Courses Inquiries)
August 13, 1996, to April 26, 1997

Monday to Thursday	0830-1900
Friday	0830-1630
Saturday	0830-1230

Closed on holiday weekends

Summer: April 28, 1997, to August 16, 1997

Monday to Friday	0830-1630
Saturday	Closed

Please see our advertising supplements (flyers) for specific dates.

Please note: Office hours for the Registration Department are currently under review and may be subject to change.

Staff

Anna Dosen, Acting Supervisor; Full-time Admissions
Rory Kine, Acting Supervisor; Part-time Registration

STUDENT RECORDS

Located on the first floor of the SW1 building, room 1525.

General Inquiries:	(604) 432-8498
BCIT transcript requests	(604) 432-8353
Verification of attendance at BCIT	(604) 432-8498
Course credit evaluation	(604) 432-8731
Graduation eligibility	(604) 432-8733
Certificate/Diploma processing	(604) 432-8733
Student information changes (address, name, etc.)	(604) 432-8353
Part-time Studies Records	(604) 432-8276

Staff

Susan Morphet, Supervisor

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.

General inquiries:	(604) 432-8451
Fax:	(604) 435-0928

Office Hours are 0830-1630

Staff

George Brown, Supervisor

ADMISSIONS

ADMISSION

ADMISSIONS

ADMISSION: FULL-TIME

Burnaby is our main campus and primary location for processing applications and maintaining permanent student records.

The Office of the Registrar operates under Institute-approved policies and procedures. This information is available at all campus 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 vocational 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 nonacceptance 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 offence 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, however, 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 (GED) 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 individual 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 a 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

ADMISSIONS

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. (604) 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 0009/0004.

5. Some Trades programs allow applicants to write an Trades Admission Assessment Test (Pretest) to determine their English language and Math ability and eligibility for entrance. Not all programs offer this option. Check the program prerequisites section to see if a Pretest 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 (604) 432-8419.

Graduates of Secondary School Career Preparation Programs

BCIT currently has agreements with a number of school districts throughout the province that 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. Applicants who are applying to BCIT for entrance as a Career Preparation student may not meet entrance requirements by successfully passing a Trades Admissions Assessment Test (Pretest). For further information see your high school counsellor, Technical Education teacher, or call BCIT Student Services at (604) 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. (604) 434-3304. The application fee of $15 must be paid at the time of application. Applications received without the $15 fee will be returned and not processed. Applicants are considered for only one program at a time. Technology applicants may indicate a first and second 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.

Note: Application processing dates are currently under review and are subject to change.

Admission: Technology Programs

Intake Period	Processing Begins
Medical Radiography:	
January 1996	October 1994
January 1997	October 1995
Electronics, Nursing:	
January 1996	June 1995
Aug/Sep 1996	October 1995
January 1997	June 1996
ETE	
January 1996	June 1995
May 1996	October 1995
September 1996	January 1996
January 1997	June 1996
May 1997	October 1996
All other Technology programs beginning in September	
September 1996	October 1995

Admission: Trades Programs

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

ADMISSIONS

Admission: Document Requirements

The following official documents MUST accompany the Application for Admission form. If you do not have official transcripts, photocopies will be accepted to allow for processing to begin. If you submit a photocopy of your transcripts, please note that BCIT reserves the right to request for official transcripts at any time before or after you have been accepted.

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 (e.g., Grade 10) has been completed.

   Applicants who are currently 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 currently attended. As well, all available interim grades to date.

   All marks must be substantiated by a final, official, secondary school transcript incorporating the school and provincial exam results.

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. You must include a self-addressed envelope with your original documents and a written request that they be returned to you. 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 Program Head of the technology to which they are applying. 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.

Excluding the provisions made in point 3, above, academic documents are not returned. Applications and documents are not retained by the Institute for those applicants who are accepted but are unable to attend classes 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 (604) 434-3304 or Academic Studies at (604) 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 program. 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 will be provisionally accepted into an Engineering Technology program. For further information refer to Academic Studies on page 102.

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 0900 to 1200, 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 in 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. (604) 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 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.

ADMISSIONS

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. Part-time day course-by-course registration **does not** imply acceptance into a full-time program of study.

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 3 days after the registration form is submitted to the Student Records office. 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 and application. 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. Details of commitment fee requirements are outlined in the offer of admission letter.

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 for some Trade programs. Applicants to Trades programs are normally wait-listed on the date their application becomes complete. If there are more applicants than seats available, programs may have a competitive selection process.

Nonacceptance

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.

PROVINCIAL WORKERS' COMPENSATION BOARD COVERAGE

Provincial Workers' Compensation Board coverage is in place for all students while participating in a required practicum at a recognized work site. Provincial Workers' Compensation Board coverage is in place during classroom/lab/shop instruction for student apprentices only; it will not be in place for any other students.

PRIVATE ACCIDENT INSURANCE PLAN FOR STUDENTS

BCIT has arranged an accident insurance plan to cover all registered students (excluding apprenticeship and general interest students) who are actively attending classes or participating in BCIT approved course of activity.

Effective September 1, 1994, coverage will be in effect for all eligible students while on BCIT property or premises, participating in an approved BCIT activity or travelling directly to or from a BCIT approved or organized activity.

BCIT has selected Policy Option A, providing $15,000 for Accidental Death & Dismemberment. Additional benefits are available under this policy, which are outlined in the brochure available at all campuses.

The cost of the plan is $3.40 per student per year (subject to change). Premium funding for this insurance plan will be paid 100% by BCIT.

This policy is not intended to replace the B.C. Medical Services Plan (MSP).

The insurer will only reimburse an insured person for expenses which are in excess of, or not insured, under personal, group or provincial hospital or medical plan of insurance for which the insured is eligible, whether enrolled in the plan or not.

ADMISSIONS

APPRENTICESHIP TRAINING

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 Skills, Training and Labour at 4946 Canada Way, Burnaby, B.C. V5G 4J6. Tel. (604) 660-7100.

"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 Skills, Training and Labour.

Apprenticeship is recognized, not only as a premier training model that provides quality of training, but also for its ongoing 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 ensuring, to the best possible extent, against future uncertainties in the supply of skilled tradespersons.

2. Apprenticeship is earning while you learn. 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 two to five periods (approximately two to five 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 industries' present and future demands.

Pre-employment Training

Pre-employment training is available in more than 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 people who have demonstrated their ability to become successful apprentices who are capable of becoming proficient in their chosen occupation, and who can meet the challenges of future technological changes.

Regular Apprenticeship

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

Technical Training

Apprentices are required to attend technical training courses of four 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 an apprenticeship and has obtained a passing mark of 70% on an approved interprovincial examination.

Apprenticeship Programs

BCIT offers Apprenticeship training in the following programs:

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

ADMISSIONS

COOPERATIVE EDUCATION (CO-OP)

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

Co-op 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, Co-op 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 Co-op 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 Co-op student must take some responsibility for these factors. While Co-op 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 independently) to find meaningful work experience.

School of Electrical and Electronic Engineering Technology and School of Engineering Technology

Some Technology programs offer Cooperative Education opportunities. Students wanting to participate in the Co-op program must meet separate requirements in addition to the Technology program entrance requirements. Each program has its own Co-op Education Admission requirements, which are available from the Electronic Engineering Technology Co-op Office at (604) 432-8753 or the Renewable Resources Co-op office at (604) 451-6910.

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 Co-op program, where the Co-op program is offered. Successful completion of the minimum Co-op placement hours is required for graduation. More information may be obtained from the Trades Training Co-op office at (604) 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 ..... (604) 432-8291
General Enquiries ..... (604) 432-8634

Technology Programs

Electronics Engineering Technology
Robotics and Automation

Ernst Wilmink ..... (604) 432-8499
General Enquiries ..... (604) 432-8753

Renewable Resources

Judith Hall ..... (604) 451-6911
General Enquiries ..... (604) 451-6910

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 (604) 432-8634 for Trades Training, (604) 432-8753 for Electronic Engineering Technology, or (604) 451-6910 for Renewable Resources programs.

COURSE IDENTIFICATION

BCIT converted from a three-digit to a four-digit course number in January 1994. The course identifier is a unique classification given to all BCIT courses. The course identifier consists 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 consists of a four-digit number, with the first digit used to indicate the level of difficulty. The next three digits are 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.

ADMISSIONS

COURSE CREDIT

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

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 (TCR)

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 creditworthy 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, e.g. Economics 3 credits, or in a program area, e.g. 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. Applications to challenge a course are available at the Student Records department.

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 two-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.

6. Course Audit

A student may audit a course with permission from the instructor. Written permission from the instructor must be submitted to the Student Records department (SW1 - 1585) no later than 14 calendar days following the commencement of classes for each level. Auditing students are not formally evaluated and do not write examinations. However, students are expected to take part in classroom discussions and laboratory exercises, maintain satisfactory attendance and pay the full course fee. Auditing students do not receive credit for the course, but receive a Statement of Marks with AUD indicated.

Once a student has declared audit status for a particular course, they may not change their status back to credit status at any point during the course for the term in which the student registered.

ADMISSIONS

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 currently enrolled at BCIT may apply for credit at any time within the academic year.

d. Students who have already been granted 50% of their full program cannot be granted further credit unless further course work is completed to maintain a 50% course load. Course substitutions must be approved by the Dean and Registrar.

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 enrol 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.

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 then returned to Student Records. 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.

KEY TO GRADES AND STANDING CODES

BCIT's grading system is based on a percentage grade for most courses, with some courses issuing separate theory and practical marks for a single course. Course passing grades vary, and courses may be assigned a standing code instead of a percentage grade. Following are the approved grades and standing codes for BCIT.

Grade	Description	Calculate in GPA?
0% - 100%	Depending on the program, the minimum passing grade for courses could be 50%, 60%, 65%, 70% or 80%	Yes
%A	Aegrotat pass standing granted to a student who has a good term record but has an incomplete evaluation due to illness or other extenuating circumstances.	Yes
%T	Provisional Pass standing — this is a temporary grade standing granted on the basis that the student will reach a pass standing in a continuing course. The %T will be changed to a '%P' (pass) or '%F' (fail) depending on the outcome in the continuing course.	Yes
%P	Pass standing granted whereby conditions of provisional pass are satisfied. The minimum pass standing for the course is awarded.	Yes
%J	Adjudicated pass standing for course marks raised to a pass based upon overall program performance, permitting the student to continue in the program or to graduate. The minimum pass standing for the course is awarded.	Yes
%F	Minimum passing requirements not satisfied.	Yes
0F	Course abandonment	Yes zero (0) value
W	Approved withdrawal within the withdrawal deadline.	No
F	Approved withdrawal after the withdrawal deadline (currently under review).	No
S	Satisfactory standing, course requirements fulfilled, no % mark assigned.	No
U	Unsatisfactory standing, course requirements not fulfilled, no % mark assigned.	No
CCR	Credit granted by successful completion of a challenge exam.	No
ECR	Exempt credit granted for a similar course taken at BCIT.	No
TCR	Transfer credit for recognition of approved equivalent studies outside of BCIT.	No
AUD	Audited Course, no credit given.	No
ATT	Non-credit course, only attendance is required, no evaluation process.	No
CIP	Course in progress.	No
EXT	Refer to outside source for grade (e.g. Apprenticeship Programs).	No
INC	Course requirements not complete and must be satisfied by a specific date.	Yes zero (0) value

ADMISSIONS

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, midterm 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. (Currently under review).

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:

TCR recognition of approved equivalent studies outside BCIT. Grade not calculated in weighted or cumulative term averages. Successful Challenge Exam.

CCR credit granted by successful completion of a challenge exam.

Course Exemption:

ECR 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 grade based on less than 100% course work completed. Student must have a good term record but has an incomplete evaluation (missed assignment or exam worth at least 25%) due to illness or other extenuating circumstances.

Adjudicated Pass:

50J, 60J, 65J, 70J or 80J course standing raised to pass level based upon overall performance, permitting the student to continue in the program or to graduate.

Provisional Pass:

%T Standing 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:

INC course requirements not complete.

Audit:

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

Attended Non-examined Course:

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

Outside Source Grade:

EXT refer to outside source for student achievement, e.g.: 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. If the student does not withdraw formally, a grade of OF will appear on the transcript. 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.

ADMISSIONS

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, and rent. These documents may also be withheld on such other grounds as directed by the Board of Governors.

Reassessment of Academic Standing/Appeal of Academic Standing

Amendments to the Reassessment and Appeal Policies and Procedures at BCIT have been approved by the Board of Governors. The revised conditions will be used in any request for Reassessment of Academic Standing or Appeal of Academic Standing received after March 15, 1994.

To review the amended Policies and Procedures, you must appear in person at the Office of the Registrar, SW1-1545. Office hours are 0830 - 1630.

Marks Reassessments

It is the policy of the Institute that students shall be dealt with fairly in all decisions affecting their academic standing. A student who is not satisfied with the final mark 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 seven 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 midterm 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 that 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 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.

BCIT will be offering Bachelor of Technology Degrees in the following fields of study: Computer Systems and Nursing (Critical Care major). For more information please contact Student Services at (604) 434-3304 or 1-800-667-0676.

ADMISSIONS

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.

Honours Standing

Honours standing is awarded by the Registrar to a graduating student whose weighted grade point average (GPA) is 80% or greater in an approved program of study that leads to a BCIT credential, not including courses for which transfer credit from an outside institution has been granted.

To be eligible for recognition the student must: take at least 50% total credit value, of the prescribed courses that are in an approved program of study, from BCIT; obtain an 80% average or greater; and, must not have failed any BCIT courses within their program of study.

Issuing of Degrees, Advanced Diplomas, Diplomas and Certificates

Upon successful completion of the requirements for certification, a graduating student must apply to the Registrar to be granted a Bachelor of Technology Degree, 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 Degree, 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 12th week of the final term or course(s), e.g. Application for the June graduation must be made not later than March 31, which is 12 weeks into the final term. For further information, please contact the graduation eligibility officer in Student Records at (604) 432-8733.

Levels of Certification	Business	Computing & Academic Studies	Electrical & Electronic Technology	Engineering Technologies	Health Sciences	Trades Training
Bachelor of Technology		Bachelor of Technology			Bachelor of Technology	
Advanced Diploma	Advanced Diploma in Business	Advanced Diploma in Software Development		Advanced Diploma in Engineering Technology	Advanced Diploma in Health Science	
Advanced Certification					Advanced Specialty Certificate	
Diploma	Diploma of Technology	Diploma of Technology	Diploma of Technology	Industrial Education Diploma	Diploma of Technology	Diploma of Trades Training Minimum 1900 hrs.
			Diploma of Trades Training	Diploma of Technology		
Certification Level 3	Senior Management Certificate	Certificate of Technology	Certificate of Technology	Industrial Education Certificate	Certificate of Technology	Advanced Certificate of Trades Training Minimum 400 hrs.
			Certificate of Trades Training	Certificate of Technology		
Certification Level 2	Management Certificate	Intermediate Certificate of Technology	Intermediate Certificate of Technology	Intermediate Certificate of Technology	Certificate & Health Care Management Level 2	Certificate of Trades Training Minimum 600 hrs.
Certification Level 1	Associate Certificate	Associate Certificate of Technology		Associate Certificate of Technology	Health Care Management Certification Level 1 & Associate Certificate	
Statement of Completion & Attendance						

ADMISSIONS

FEES AND EXPENSES: FULL-TIME TECHNOLOGY PROGRAMS

Tuition Fee Policy for Academic Year 1996/97 (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 1995/96 and are subject to change each academic year.

1. A nontransferable 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.

   Note: For the academic year 1996/97 the non-refundable, nontransferable commitment fee will be increased to $200.

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 21.)

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 nonpayment 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 $85 per credit to maximum tuition fee of $1,119 per level.

Payments can be made by Cash, VISA, Interac 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 1996/97 year by the BCIT Board of Governors and may be subject to change. Current 1995/96 fees are as follows:

	1st Year	2nd & 3rd Year (each)
General tuition:	$2238.00	$2238.00
Student activity fee:	100.30	100.30
Total:	**2338.30**	**2238.30**

First-year Students — Subject to change for 1996/97

All first-year students must pay their fees according to the deadline dates specified in the Calendar of Events, see page 21.

First Level	
General tuition (includes $75 non-refundable commitment fee, $200 for 96/97)	$ 1,119.00
Student activity fee:	50.15
Total:	**1169.15**
Second Level	
General tuition	$1119.00
Student activity fee:	50.15
Total:	**1169.15**

Second and Third-year Students — Subject to change for 1996/97

All second and third-year students must pay their fees according to the deadline dates specified in the Calendar of Events, see page 21.

Third Level	
General tuition	$1119.00
Student activity fee:	50.15
Total:	**1169.15**
Fourth Level	
General tuition	$1119.00
Student activity fee:	50.15
Total:	**1169.15**

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, see page 21.

School of Engineering Technology

School of Electrical and Electronic Engineering 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, see page 21.

Co-op Fees — Electronics & Robotics + Renewable Resources (Per Level)

Note: Co-op Program specific dates are outlined in the Calendar of Events, see page 21.

Electronics and Robotics	
General tuition	$460.00
Student activity fee	22.00
Total:	**482.00**
Renewable Resources:	
General tuition	$360.00
Student activity fee	17.50
Total:	**377.50**

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 21.

Adult Echocardiography	
General tuition (includes $75 non-refundable commitment fee, $200 for 96/97)	$1119.00
Student activity fee:	50.15
Total:	**1169.15**
Medical Laboratory — Fifth Level only	
Registration Fee	$300.00

One-year Post-diploma Programs

Fifth Level — due 60 days prior to the commencement of classes:

General tuition (includes $75 non-refundable commitment fee, $200 for 96/97)	$1,119.00
Student activity fee:	50.15
Total:	**1169.15**

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

General tuition	$1119.00
Student activity fee:	50.15
Total:	**1169.15**

ADMISSIONS

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 $85 per credit to a tuition maximum of $1119 per level. These fees are subject to change for 1996/97. An additional $50 late fee will be assessed if fees are not paid by the due date. Students will be subject to withdrawal for nonpayment 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 $110 per credit to a tuition fee maximum of $1119 per term/level. These fees are subject to change for 1996/97. Students will be subject to withdrawal for nonpayment of fees. Late fee policies also apply to this program.

Technology Degree Program

All students must pay according to the specified dates outlined in the calendar of events. Course-by-course fees are assessed to the tuition fee maximum of $1800 per term. These fees are subject to change for 1996/97. Students will be subject to withdrawal for nonpayment of fees. Late fee policies and refund policies also apply to these programs.

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

(see next page)

Tuition Fee Policy for Academic Year 1996/97 (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 1995/96 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.

   Note: For the academic year 1996/97 the non-refundable, nontransferable commitment fee will be increased to $100.

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 nonpayment of fees and their registration cancelled until full payment has been received by the Institute.

Annual Fees (subject to change for 1996/97)

Tuition fees and all related policies are under review for the 1996/97 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 1996/97 tuition fee rate is $33 per week or $132 per month for most programs.

The student activity fee for fixed-duration training programs varies according to the length of the program. The 1994/95 student activity fee rate is $2.15 per week or $8.60 per month. Students are required to pay the student activity fee at the time of registration. This includes **all** apprenticeship students.

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.

ADMISSIONS

Sea Island Campus

The following programs are assessed per term:

STUDENT PROGRAM NAME	TUITION FEE	ACTIVITY FEE	LAB FEE***	TOTAL
Aircraft Maintenance	1017.00	34.40		1051.40
Aircraft Electronics Avionics	1017.00	34.40		1051.40
Aircraft Structures	509.00	34.40		543.40
Aircraft Gas Turbine Technician	615.00	45.15		660.15
Electronics Core*	996.00	73.10	75.00	1144.16
Special Sea Island Course*				
Sea Island Program Extensions:	(1995/96)	Tuition $78.00 /wk SA Fees $ 2.15 /wk		
Aircraft Structures Extensions:	(1995/96)	Tuition $39.00 /wk SA Fees $ 2.15 /wk		

Burnaby Campus

The following programs are assessed by program duration:

Architectural Design	1320.00	86.00		1406.00
Architectural/Civil Drafting	1320.00	86.00		1406.00
Architectural/Mech Drafting	1320.00	86.00		1406.00
Architectural/Struct Drafting	1320.00	86.00		1406.00
Automated Business Equipment	1320.00	86.00	75.00	1481.00
Auto Collision—Term 1	768.00	50.40		818.40
Auto Collision—Term 2	768.00	50.40		818.40
Auto Collision—Term 3	528.00	34.40		562.40
Auto Electronic Tech	561.00	36.55		597.55
Auto Service Tech—Term 1	624.00	40.95		664.95
Auto Service Tech—Term 2	624.00	40.95		664.95
Auto Service Tech—Term 3	624.00	40.95		664.95
Auto Service Tech—Term 4	429.00	27.95		456.95
Auto Mechanic ELTT	1152.00	73.10		1225.10
Auto Mechanic-Toyota Spons	1350.00	86.00	250.00	1686.00
Joinery ELTT (benchwork)	954.00	60.20		1014.20
Boilermaker ELTT	789.00	49.45		838.45
Carpentry ELTT	954.00	60.20		1014.20
Commercial Transport ELTT	1020.00	64.50		1084.50
CNC Machinist	462.00	30.10		492.10
CNC Programmer	330.00	21.50		351.50
CNC Programmer Advanced	330.00	21.50		351.50
Diesel Engine Electronics Tech	330.00	21.50		351.50
Diesel Engine Mechanic	1461.00	90.30		1506.30
Drafting				
Architectural Design	1320.00	86.00		1406.00
Civil Drafting	1320.00	86.00		1406.00
Mechanical Drafting	1320.00	86.00		1406.00
Structural Drafting	1320.00	86.00		1406.00
Elect Control Service Tech	1320.00	86.00	75.00	1481.00
Electricity Eltt & Ind Electronics	1350.00	86.00	75.00	1511.00
Electronics Technician				
(Core) Full-time Day	990.00	64.50	75.00	1129.50
Electronics Technician (Core)				
Part-time Evening (Per Year)	613.00	32.25	40.00	645.25
Fresh Start Program	627.00	40.85		667.85
H.V.A.C. Program—Term 1	960.00	63.00		1023.00
H.V.A.C. Program—Term 2	630.00	41.50		671.50
H.V.A.C. Program—Term 3	330.00	21.50		351.50
Heavy Duty Mechanic	1020.00	64.50		1084.50
Inboard/Outboard Mechanic	1188.00	77.40		1265.40
Ind Instrumentation Service Tech	1320.00	86.00	75.00	1481.00
Indus Maint Mechanic—Term 1	768.00	50.40		818.40
Indus Maint Mechanic—Term 2	768.00	50.40		818.40
Indus Maint Mechanic—Term 3	528.00	34.40		562.40
Ironworking	759.00	49.45		808.45
Joinery	954.00	60.20		1014.20
Machinist	1152.00	73.10		1225.10
Millwright	1317.00	83.85		1400.85
Motorcycle Mechanic	1152.00	73.10		1225.10
Painting & Decorating	660.00	43.00		703.00
Plumbing	1020.00	64.50		1084.50
Power Eng. (Gen & Tech)	1320.00	86.00		1406.00
Power Engineering				
(Power * Process)	1320.00	86.00		1406.00
Power Equipment Mechanic ELTT	1152.00	73.10		1225.10
Refrigeration Mechanic ELTT	855.00	53.75		908.75
Security Alarm Installer	660.00	43.00	75.00	778.00
Sheet Metal	690.00	43.00		773.00
Steamfitting	1020.00	64.50		1084.50
Steel Fabrication	759.00	49.45		808.45
Steel Fabrication—Welding	495.00	32.25		527.25
Telecommunication Technician	1320.00	86.00	75.00	1481.00
Tool and Die Tech—Term 1	960.00	63.00		1023.00
Tool and Die Tech—Term 2	960.00	63.00		1023.00
Tool and Die Tech—Term 3	660.00	43.00		703.00
Welding Level B	528.00	34.40		562.40
Welding Level C	990.00	64.50		1054.50
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: $132 per month (4 weeks) and $8.60 per month S.A. Fee = $140.60 month (4 weeks)

Program Extensions: Effective August 1, 1995, there will be a minimum charge of $75 tuition and $2.15 Student Activity Fee. Program extensions with a duration of three weeks or more will be assessed at a weekly rate of $33.00 tuition and $2.15 Student Activity Fee, as noted below.

Program Extensions	Tuition	SA Fee	Total
1 week	75.00	2.15	77.15
2 weeks	75.00	4.30	79.30
3 weeks	90.00	6.45	96.45
4 weeks	120.00	8.60	128.60

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
Late Fee	$150	after 30 calendar days
NSF Cheques	$15	
*Parking: Technology Students	$44	September—December
	$55	January—May
*Parking: Trades Students	$11	monthly
*Other Student Parking Rates	$ 6	per month—student handicapped
	$ 5	per month—student motorcycle
Reassessment of Marks	$25	per course
Appeal of Reassessment	$50	per course
Replacement Diploma/Certificate	$50	
Transcript of Marks	$ 5	for first copy and
	$ 1	for each additional copy

*all taxes included

ADMISSIONS

WITHDRAWAL AND REFUND PROCEDURES (Subject to change)

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

Note: Change to the current refund policy, effective for the 1996/97 academic year.

The current deadlines remain the same but the amount withheld will be:
General Tuition: Complete refund less 25%
Student Activity: Complete refund.

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

General Tuition: No refund
Student Activity: 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.

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.

Note: Change to the current refund policy, effective for the 1996/97 academic year.

The current deadlines remain the same but the amount withheld will be:
General Tuition: Complete refund less 25%
Student Activity: Complete refund.

In all cases the commitment fee is non-refundable.

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.

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 1996/97

BCIT is not open on statutory holidays.

Note: The following dates apply to all full-time technology programs (including the Engineering Technology Entry Program), and intake dates for the majority of Trades programs beginning in September and January. Exceptions for Electronics Technology, Cytogenetics Laboratory Technology, Diagnostic Medical Sonography, Medical Laboratory Technology, Medical Radiography, Nursing are identified in each month.

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

1996

JUNE

19	Wed	Graduating Awards Ceremonies
20/21	Thr-Fri	Spring Convocation

Nursing

14	Fri	Level 1: Fee deadline for term starting August 19.

JULY

1	Mon	Canada Day — BCIT Closed.
5	Fri	Level 1: Fee deadline for September 3 term start.

Electronic Engineering Technology

26	Fri	Application deadline for students on modified programs.

AUGUST

5	Mon	B.C. DAY — BCIT Closed.

Electronic Engineering Technology

27/28	Tue/Wed	Timetabling for students on modified programs.
29	Thu	In-person registration for persons on modified programs.

Nursing

19	Mon	Levels 1-5: Registration and orientation.
23	Fri	Levels 2-5: Fee deadline for classes starting August 19.

SEPTEMBER

2	Mon	Labour Day — BCIT Closed.
3	Tue	Levels 1, 3 & 5: Registration and Orientation for Technology Programs.
4	Wed	Classes begin for Technology Programs.
6	Fri	Level 3: Fee deadline for September 3 term start.
17	Tue	• Last day to withdraw to receive a full refund (less $200). • Last day to apply for course credit/or exemption and to apply to audit same course(s).
18	Wed	Shinerama

Electronic Engineering Technology

3	Tue	Co-op work terms 1 and 2 begin.
4	Wed	Electronic Engineering Technology classes begin.
6	Fri	• Level 2, 3, 4 and Co-op 1 & 2: Fees due. • Last day to change sections for students on modified programs.
17	Tue	Last day to apply for course credit/or exemption and to apply to audit these courses.

Nursing

3	Tue	• Last day to withdraw to receive full refund (less $200). • Last day to apply for course credit/ exemption apply to audit same course(s).

CALENDAR OF EVENTS 1996/97

1996

OCTOBER

14	Mon	Thanksgiving — BCIT Closed.
23	Wed	Entrance Awards Reception
30	Wed	Scholarships & Awards Ceremonies

Electronic Engineering Technology

9	Wed	Last day to withdraw to receive "W" from Term A Courses.
25	Fri	Term A courses end.
28	Mon	Term B courses begin.

Cytogenetics

4	Fri	Last clinical day. Note: There is no summer break for this program.

Medical Radiography Technology

30	Wed	Last day to withdraw in order to receive a "W" on the transcript.

NOVEMBER

8	Fri	Full fees are due for Level 1 students in Technology programs commencing Jan 2, 1997.
11	Mon	Remembrance Day — BCIT Closed.
12	Tue	Last day to withdraw in order to receive "W" on transcript for full term courses beginning September 3 (2/3rds through course).

Electronic Engineering Technology

20	Wed	Last day to withdraw in order to receive "W" on transcript for full term courses beginning September 3 term start.
29	Fri	Level 1: Fee deadline for January 27, 1997 term start. Term B: Last date to withdraw to receive "W" on transcript.

Nursing

4	Mon	• Last day to withdraw to receive "W" on transcript. • Level 1: Fee deadline for January 6/97 term start.

DECEMBER

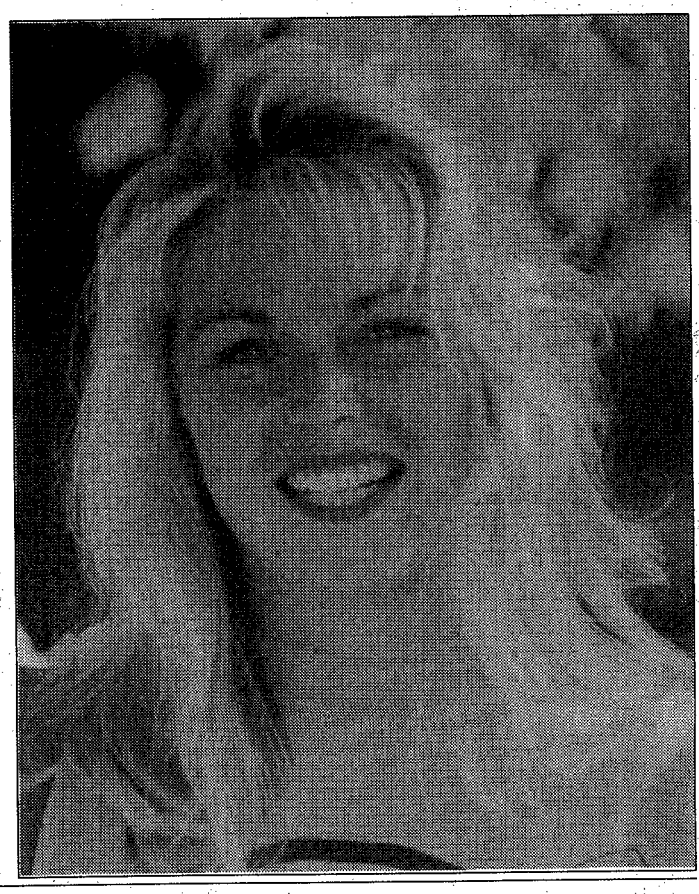
9-13	Mon-Fri	Examinations (most technologies).
16	Mon	Start of Christmas break for technology students.
24	Tue	Christmas Eve — BCIT Closed.
25	Wed	Christmas Day — BCIT Closed.
26	Thu	Boxing Day — BCIT Closed.
31	Tue	New Year's Eve — BCIT Closed.

Electronic Engineering Technology

17	Tue	Last day of classes before Christmas break.

Nursing

9-13	Mon-Fri	All Levels: Examinations.
16	Mon	Start of Christmas break.



CALENDAR OF EVENTS 1996/97

1997

JANUARY

1	Wed	New Year's Day — BCIT Closed.
2	Thu	• Fall term 1996 marks posted for Technology Programs. • Technology classes begin.
10	Fri	Level 2, 4, 6: Fee deadline for January 2 term start.
14	Tue	• Last day to withdraw to receive full refund (less $200). • Last day to apply for course credit/ exemption and to apply to audit same course(s).
30	Thu	Winter Convocation.

Electronic Engineering Technology

2	Thu	Classes resume for Electronic Engineering Technology
6-10	Mon-Fri	Examinations for all levels.
21/22	Tue/Wed	Timetabling for students on modified programs
23	Thu	In-person registration for students on modified programs.
27	Mon	Registration for Level 1 students. Electronic Engineering Technology Classes begin.
31	Fri	• Last day to change sections for students on modified programs. • Levels 2, 3, 4 and Co-op 1, 2 fees due.

Medical Radiography Technology

2	Thu	Fall term marks posted.
3	Fri	Level 1 and 3: Student orientation.
14	Tue	Level 3: Term fee deadline.

Nursing

3	Fri	Fall term marks posted.
6	Mon	Levels 1-4: Registration and Orientation.
10	Fri	Levels 1-4: Fee deadline.
13	Mon	Level 5: Registration.
17	Fri	Level 5: Fee deadline.
20	Mon	• Levels 1-4: Last day to withdraw to receive refund (less $200 for level 1). • Levels 1-4: Last day to apply for course credit/exemption and to apply to audit same course(s).
27	Mon	Level 5: Last day to withdraw to receive refund

FEBRUARY

13	Thr	Last day to withdraw from term A (1/2 term) and receive a "W" on transcript (2/3rds through 1/2 term course).

Electronic Engineering Technology

10	Mon	• Last day to withdraw to receive full refund (less $200 for Level 1). • Last day to apply for course credit or exemption and to apply to audit these courses.

MARCH

10-14	Mon-Fri	Spring Break (except Electronics Technology and Robotics).
14	Fri	Last day to withdraw from ETE course(s) (Jan 2 start) in order to receive a "W" on transcript (2/3rds through program).

Electronic Engineering Technology

5	Wed	Term A Courses: Last day to withdraw to receive "W" on transcript.
19	Wed	Term A Courses End.
20	Thr	Term B Courses Begin.

Cytogenetics

3-7	Mon-Fri	Didactic II, Level 6: Exams.
17	Mon	Clinical orientation phase begins.

Medical Radiography Technology

10-14	Mon-Fri	Spring Break.
14	Fri	Last day to withdraw to receive "W" on transcript.

Nursing

3-7	Mon-Fri	Spring Break.
31	Mon	Last day to withdraw to receive "W" on transcript.

CALENDAR OF EVENTS 1996/97

1997

APRIL

4	Fri	Good Friday — BCIT Closed.
7	Mon	Easter Monday — BCIT Closed.
9	Wed	Last day to withdraw to receive "W" on transcript, for full term courses (2/3rds through course)
25	Fri	End date for ETE Program (Jan 2 start). Last day to withdraw from term B (1/2 term) and receive a "W" on transcript (2/3rds through 1/2 term course(s).
28	Mon	Start date ETE

Electronic Engineering Technology

9	Wed	Full Term Courses: Last day to withdraw to receive "W" on transcript for full term courses.

Cytogenetics

29	Mon	Clinical phase begins.

Diagnostic Medical Sonography

21/22	Mon/Tue	Term A, Level 6: Exams.
28-2	Mon-Fri	Spring Break

Medical Radiography Technology

21-25	Mon-Fri	Level 1 & 3: Examinations.
28	Mon	Level 1 & 4: Practicum commences.

MAY

19	Mon	Victoria Day Holiday — BCIT Closed.
20-23	Tue-Sat	Examinations for all levels

Electronic Engineering Technology

2	Fri	Term B Courses: Last day to withdraw to receive "W" on transcript.
20-23	Tue-Sat	Examinations for all levels.

Diagnostic Medical Sonography

4	Mon	Term B, Level 6: Start.

Medical Radiography Technology

22	Fri	Level 1: Practicum ends.

Nursing

5-9	Mon-Fri	All Levels: Examinations.
12	Mon	Summer break starts.

JUNE

18	Wed	Graduating Awards Ceremonies.
19/20	Thr/Fri	Spring Convocation.

SERVICES

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 service is available at various times of the year.

Phone (604) 434-3304 for information.

Staff

Jim Mitchell, Director,
Student Services
Randy Friesen, Marketing Systems
Coordinator, Enrolment Management
Lisa Pedersen, Clerical Supervisor
Mariana Aussem, Clerical Support
Lisa Shelton, Clerical Support
Darlene Napper, Clerical Support
Glenda Hopkins, Clerical Support

PROGRAM ADVISING

Program advisors provide information about full- and part-time programs, and the career opportunities they may lead to. We help students select programs based on skill requirements and their own career goals. Students with undefined goals are often assisted by our career information planning sessions as well. Program advisors participate in secondary school, college and community visits throughout the province, familiarizing prospective students with BCIT programs and services. To make an appointment, or for more information, please contact us at Tel.: (604) 434-3304, Fax: (604) 433-1184, Toll-Free (B.C.—outside Lower Mainland — hours 1300-1600): 1-800-667-0676, Electronic Mail: studserv@bcit.bc.ca (must provide address and telephone number).

Program Advisors:

Janeen Alliston, B.A.
Raelene Christie, B.A., Coordinator
Chikako Fong, B.A.
Shonna Giles, B.A.B.Ed. (job share)
Pat McCall, B.A.
Lynda Mychaluk, B.A.
Marguerite Pierre, B.A. (job share)

Program Advisors: Part-time Studies

Sandra Zanatta, Business (on leave)
Chris Lloyd, Dipl.T., Business and
Continuing Studies
Midge Mason, B.A., B.Ed., Business and
Continuing Studies
Ann McNaughton, Cert., Engineering
Technologies and Trades

COUNSELLING SERVICES

A Counsellor can Help You:

- enhance your performance and maximize your experience as a student.
- develop decision-making and problem-solving skills;
- work toward your career, educational and personal goals;
- access Community and Institute resources and services.

Appointments

Enrolled students have priority for appointments.

- Quick response and emergency appointments are available as well as regularly scheduled appointments.
- Students in crisis are seen immediately.
- Counselling Services are free of charge and available from 0830-1630, Monday to Friday.

Educational Counselling for Enrolled Students

Attending a post-secondary institute can present unexpected challenges. A transition from high school to post-secondary or re-entering school after an absence can be big adjustments in themselves. Our counsellors help you with study skills, time management, and communication skills.

Personal/Relationship Counselling

Stress, relationships, grieving and loneliness can all affect your life as a student. We offer ongoing counselling and support to help you identify and clarify problems, establish priorities, set goals, and make positive life management decisions.

Crisis Counselling

Some students experience an unexpected or traumatic event in their lives that affects their ability to concentrate and study. We can help you develop strategies to cope during this period. We refer students to Institute and Community Resources, where appropriate.

Student Success Workshops

Noon-hour and afternoon workshops are offered on such topics as:

- study skills strategies
- stress management
- time management
- coping with test anxiety
- self-esteem & assertiveness
- conflict resolution skills
- strategies for working on team projects
- job search strategies and interview skills
- resume writing
- post-diploma and degree completion options

See our poster for the term schedule.
Pre-register via voice mail at (604) 451-6735 or drop in.

Ongoing Weekly Support Groups

- Building Self-esteem and Assertiveness

Pre-registration is required

Program specific workshops

The following workshops are available on request (subject to availability):

- Health Sciences: Coping with Anxiety in Clinical Settings
- Electronics: Study skills
- Aviation Trades: Study skills
- Residence Advisors Training

Orientation to BCIT

Early Orientation

Counsellors provide early and special orientations to assist students in preparing for BCIT.

Term and Class Start-up Orientation

Throughout the year, counsellors welcome new students and encourage them to take full advantage of activities and services.

Special sessions are offered for out-of-town students, returning adult students, students in relationships and students with children.

Career Planning and Development

Selecting a career path can be overwhelming. Sometimes you discover that you're not in the best program for you. We can determine your interests, skills, and life and career values. You can then make informed decisions about your goals and focus on finding the program you want and securing employment after graduation.

SERVICES

Student Life and Career Resource Centre

Reference material on career planning, occupational choices and student life information is available. These include videos, brochures and career profiles on BCIT programs and other educational opportunities.

Referrals

To Counselling from

- Self-referral: Drop in or call (604) 434-3304 (Student Services reception).
- Peer referral: Classmates, residence advisors.
- Faculty/Staff/Administration: e.g. instructor.
- Family/Friends referral
- Agency referral.
- Program Advising.

From Counselling to

- faculty or Administration;
- other Student Services;
- community resources and support services.

For Prospective Students

Prospective students are seen for Career Counselling on referral from:

- introduction to career planning group;
- program advisors;
- faculty or administration;
- external agencies or organizations.

Introduction to Career Planning Group

- Introductory exploration and clarification of career goals for individuals considering BCIT programs.
- Bimonthly workshops

To register for this workshop contact Student Services reception at (604) 434-3304.

Career Search Workshop (HRMG 0315)

This 12-hour course is designed for you to explore and define your interests, aptitudes, transferable skills, personal and career values and career goals.

To register for this Part-time Studies course contact Part-time Studies at (604) 434-1610 or (604) 687-4666.

Career Transition Workshop

This service is contracted through BCIT's Business Industry Services for specific groups experiencing career transitions due to downsizing, restructuring or automation.

Contact any member of the counselling services team for information on this service.

Counselling Team

Our counsellors are professionally trained and have extensive experience with adults in post-secondary settings. They are committed to providing the highest level of service, and uphold the College of Psychologists and the College and Institute Counsellors' Association accepted ethical standards.

Confidentiality

All information gathered in counselling sessions is held in strict confidence. No information is released to Institute administrators, instructors, parents or outside agencies unless authorized by the student or required by law.

Counselling Office

Counselling Services is located in building SW1, room 2300. Tel. (604) 434-3304.

Counselling Staff

Stu Gibbs, B.A., M.S.Ed.,
Counsellor/Coordinator, Liaison — Trades/Electrical, Electronics

Heather Hyde, B.A., M.A., R.Psych.,
Counsellor, Liaison — Health/Business

Jean Spence, B.A., M.Ed.,
Counsellor, Liaison — Engineering/ Computing and Academic Studies

SERVICES FOR FIRST NATIONS STUDENTS

The First Nations Advisor provides culturally-appropriate services for status, non-status, Metis and Inuit students of First Nations ancestry. Services include orientation and transition support, advising, referral and advocacy.

First Nations Staff

Brenda Ireland, M.A., Coordinator
First Nations program
Tel. (604) 451-6901

Greg George, First Nations Advisor
Tel. (604) 451-7026

EDUCATIONAL RESOURCE CENTRE FOR STUDENTS WITH DISABILITIES

BCIT is committed to providing access to students with disabilities. We offer a variety of support services including:

- career counselling
- educational counselling
- interpreting services
- tutoring
- note taking
- taped books
- proof readers
- exam accommodations
- assistance with campus access

Students with learning disabilities are assessed to determine learning strengths and identify appropriate support services. Also, we suggest taking advantage of the Learning Resource Centre, or the Learning for Success Program (BCIT 0130) which provides a "toolbox" of general learning skills that can be applied in any environment where structured learning is required.

Students with mobility impairments. Handicapped parking is available for students with medical documentation. Also, arrangements may be made through the ERC for timetable adjustments to obtain a close proximity of classes.

Students who are deaf and hard of hearing will need to request interpreting services at least three months before classes start. To request an interpreter please contact the Western Institute for the Deaf and Hard of Hearing at (604) 736-7391.

Students with visual disabilities should apply for taped text books and/or adapted equipment at least three months before classes begin, to ensure availability.

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SERVICES

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Appointments

Office hours are 0830 to 1630, Monday - Friday, with evening appointments available on Wednesday. Please call Karen Harvey at (604) 451-6963, (604) 432-8954 (TTY), (604) 433-1184 (Fax) or Student Services reception at (604) 434-3304 to book an appointment.

Educational Resource Centre Staff

Shirley Coomber, M.Ed., A.R.W., Coordinator/Counsellor
Derek McLauchlan, Ph.D. Learning Specialist/ Counsellor
Alison Parry, B.A. (Hons.), Assistant Instructor
Linda Young-Jones, M.Ed., CCRC, Counsellor
Marna Arnell, B.A., Interpreting Services Facilitator
Joyce Davidson, B.A., Administrative Assistant
Karen Harvey, Disability Resource Clerk

FREE INFORMATION SESSIONS ON FULL-TIME PROGRAMS AT BCIT

Information sessions are an excellent way for you to find out about BCIT programs. If you have a general interest in an area but are unsure of specific program offerings, the information sessions can give you some direction and help you with your educational decision. Check with Student Services about additional "program specific" information sessions that are also held throughout the year.

Note: Please call the registration number listed to reserve a seat and confirm the date and time of each session you want to attend as sessions may be added or cancelled throughout the year.

School of Trades Training

(last Friday of the month)
These sessions will consist of an overview of Trades Training programs followed by a tour of selected BCIT Trades Training programs.

Fri — Sept 29, 1995
Fri — Oct 27, 1995
Fri — Nov 24, 1995
Fri — Jan 26, 1996
Fri — Feb 23, 1996
Fri — Mar 29, 1996
Fri — Apr 26, 1996
Fri — May 24, 1996
Fri — June 28, 1996

Where: Student Services Presentation Room (SW1 - 1125)
When: 0900 - 1200
Register: Call Student Services at (604) 434-3304 up to one month prior to the date you want to attend. (e.g. for the September 29 session you can call anytime after August 29)

School of Electrical and Electronic Technology

These sessions will provide information on all full-time programs offered through the School of Electrical and Electronic Technology.

Tue — Oct 17, 1995
Tue — Feb 27, 1996

Where: IBM Building - Theatre 233
When: 1830 - 2030
Register: Call Student Services at (604) 434-3304 up to one month prior to the date you want to attend.

School of Business

These sessions will provide an overview of the School of Business programs. If you have an interest in a business career and are unsure of the specific program you are best suited for, this is the session for you. If you have already chosen a program and have specific questions contact Student Services at (604) 434-3304 to arrange an interview with a Program Advisor.

Tue — Oct 3, 1995
Mon — Nov 6, 1995
Tue — Feb 20, 1996
Mon — Apr 22, 1996

Where: IBM Building - Theatre 233
When: 1830 - 2030
Register: Call Student Services at (604) 434-3304 up to one month prior to the date you want to attend.

Computer Systems

These sessions will cover all aspects of the Computer Systems program. Included will be information about workload, class structure, program content, and career information.

Wed — Nov 8, 1995
Mon — Jan 22, 1996
Wed — Feb 21, 1996
Mon — March 25, 1996
Wed — May 8, 1996

Where: IBM Building - Town Square A and B
When: 1830 - 2030
Register: Call Student Services at (604) 434-3304 up to one month prior to the date you want to attend.

School of Engineering Technology

Programs related to building & construction:
Building Civil & Structural
Surveying & Mapping
Mechanical Technology (Systems)

Mon — Oct 2, 1995
Mon — May 6, 1996

Programs related to computers:
Mechanical Technology (CADCAM)
Robotics & Automation
Electronics Technology
Geographic Information Systems

Mon — Nov 6, 1995

Programs related to manufacturing:
Plastics Wood Products Manufacturing
Mechanical Technology (Manufacturing)
Petroleum & Natural Gas
Robotics & Automation Electronics Technology

Mon — Dec 4, 1995
Mon — May 20, 1996

Programs related to natural resources:
Forestry, Fish, Wildlife & Recreation
Wood Products Manufacturing
Petroleum & Natural Gas
Mining
Chemical Sciences

Mon — Feb 5, 1996
Mon — June 3, 1996

Advanced diploma & degree programs:
Applied Environmental Engineering Technology
Technology Management
Geographic Information Systems
Construction Management
Mechanical Technology

Mon— Mar 4, 1996

Programs related to lab sciences
Biotechnology Food Technology
Chemical Sciences

Mon— April 1, 1996
Mon— June 17, 1996

Where: All School of Engineering information sessions will be held in the Student Services Presentation Room (SW1 - 1125) — Burnaby campus.
When: 1830 - 2030
Register: Call (604) 451-7001 up to one month prior to the date you want to attend.

BCIT POLICY ON ABUSIVE OR THREATENING BEHAVIOUR

Introduction

BCIT's campuses are used by many groups and individuals including students, staff, and visitors who have business with BCIT. BCIT acknowledges that individuals on campus are not expected to tolerate threatening or abusive behaviour from anyone.

Policy

BCIT will not tolerate violent, intimidating or abusive behaviour that threatens the safety of its students, employees and/or visitors. Individuals who act in a threatening or abusive manner, whether verbally or physically, will be asked to leave the BCIT premises immediately and will forfeit the right to conduct campus business and access Institute services.

FINANCIAL AID & 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.

B.C. Student Assistance Program

The B.C. Student Assistance Program includes three types of assistance: Canada Student Loans; B.C. Student Loans; and non-repayable grants. The maximum assistance a student is eligible for varies according to program length and whether a student has dependants. Based on 1995/96 guidelines, the maximums are:

PROGRAM LENGTH WEEKS	WITHOUT DEPENDANTS	WITH DEPENDANTS
13	$ 3055	$ 4680
17	$ 3995	$ 6120
22	$ 5170	$ 7920
26	$ 6110	$ 9360
30	$ 7050	$10800
34	$ 7990	$12240
39	$ 9165	$14040
43	$10105	$15480
52	$12220	$18720

Note: "Dependants" refers to 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 three 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 that 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 mid-August.

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.

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 (604) 432-8847.

BCIT has other Entrance Awards for students entering specific BCIT Trades and Technology programs. For further details contact the Financial Aid and Awards office.

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.

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SERVICES

BCIT Bursaries continued from page 29

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 full-time 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 who received the highest averages in the first year of their technology and are entering second year. Students must have carried a 100% course load in both levels of their first year. Presentations are made at the October Scholarship Ceremonies. These awards are automatic with no application necessary.

Graduating Awards

Based on second-year performance, graduating awards are presented to full-time technology students who achieve the highest academic standing in the final two academic levels of their program of studies. Students must have carried a 100% course load in both levels.

For Further Information

More information on the above programs and a BCIT Student Financial Aid and Awards handbook may be obtained from Financial Aid Reception in Student Services (SW1 Building, room 2300). Office hours are Monday to Friday, 0830 - 1630. Telephone (604) 432-8555.

Staff

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

BCIT INTERNATIONAL

BCIT International develops and coordinates international activities with industry, government agencies and other agencies in B.C., Canada and overseas. Department activities provide professional development and study 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.

BCIT International 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 and part-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.

BCIT International Office

The office is located in NW1.
Tel: (604) 432-8816, Fax (604) 430-9042,
e-mail ietr0100@bcit.bc.ca.

Staff

Henry Arthur, Executive Director,
Tel. (604) 432-8622
Donna Hooker, Coordinator, International Training Projects
Tel. (604) 432-8842
Jeanne Kurz, Project Consultant
Tel. (604) 432-8968
Ann Lacey, Project Secretary
Tel. ((604) 432-8674
Kathy Lau, Financial Officer
Tel. (604) 432-8969
Lexie McManus, Project Assistant
Tel. (604) 432-8966
Mark Eric Miller, Manager
Tel. (604) 432-8964
International Student Advisor
Tel. (604) 432-8475
Margaret Neylan, Health Specialist
Tel. (604) 432-8583
Karen Wantke, Project Clerk
Tel. (604) 432-8816
Teana Wong, Administrative Assistant
Tel. (604) 432-8816

Special Programs for International Students and New Landed Immigrants

Students who speak English as a second language will benefit from our special programs which are designed to integrate technical training with English language development.

These programs include:

Program	Length (Months)	Start Dates	Entrance Requirements
Academic Business Program	8	Jan May Sep	High School TOEFL 450 A score of TOEFL 515 will permit direct entry to term 2 of this program
Business Management Studies	16	Jan	High School completion
Media Techniques for Business	12	Sep	High School completion TOEFL 515
Computer Skills for the Office	8	Jan May Sep	High School completion TOEFL 515
Interior Design Program	12	Sep	High School completion TOEFL 500
Aircraft Maintenance Technician	18	June	High School completion TOEFL 550
Study Tours • AutoCAD • Multimedia and the Information Highway • Canada's Wild West • Tour Operation	20 days	July	Intermediate English

SERVICES

WOMEN IN TRADES

Things to Know About Women and Trades Training at BCIT

BCIT has established a number of support structures to assist students. Some of these are directed specifically toward women trades students, others are not but may also be of interest and help to women. It is our intent that all students at the Institute have a positive and rewarding experience while in training.

Personnel

Anne St. Eloi, Coordinator, Women in Trades
Tel. (604) 432-8233
Brenda Ireland, First Nations Student Advisor
Tel. (604) 451-6901
Shirley Coomber, Special Needs Counsellor
Tel. (604) 432-8437
Stu Gibbs, Counselling Services, Liaison, School of Trades
Tel. (604) 432-8436
Heather Hyde, Counsellor
Tel. (604) 432-8432
Jean Spence, Counsellor
Tel. (604) 432-8432
Maggie Ross, Harassment Advisor
Tel. (604) 451-6721
Michele Medlicott, Harassment Advisor
Tel. (604) 451-6721

Financial Aid and Awards

(for a complete list of awards for students call (604) 432-8555)
CN Scholarship for Women
The Simons Foundation Award for Women in Trades
Women in Trades Entrance Awards
B.C. Women's Equality Bursary
Bridging the Gap Bursaries

Financial Aid and Awards has an information session every Friday afternoon at 1330. For more information call (604) 432-8555.

Special Training Programs

Periodically BCIT offers special training programs to increase the number of women in trades training. In 1994 the 50/50 Sheet Metal program trained eight women and eight men in entry-level sheet metal skills. More programs of this nature are being considered. For more information contact the coordinator, Women in Trades at (604) 432-8233.

Dean's Advisory Committee on Equity

A committee of people both internal and external to BCIT has been established to advise the Dean of Trades on equity issues.

Instructor's Workshop

To give instructors insight and skills to help them be more effective in teaching women in their classes we have developed a workshop: Playing the New Game — A workshop on strategies for successfully integrating women into the classroom.

Additional Support

There are two organizations outside BCIT especially for women in trades: Lower Mainland WITT and the WITT National Network. Contact Anabelle Paxton, (604) 255-4565.

Lower Mainland WITT meets the second Tuesday of the month. Contact Anne St. Eloi at BCIT (604) 432-8233 to be put on their mailing list.

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. The Library has a wide variety of books, periodicals, technical reports, videos, maps, etc. There are specialized collections of legal materials, standards, Statistics Canada publications and much more. The library has the latest in computerized information including Internet and in-house CD-ROM access. The ground floor microcomputer centre is for student use in preparing reports, spreadsheets, etc. The library is also wheelchair accessible and has special needs facilities such as a print-to-voice machine for the visually challenged. It's your library. Let us help you with your information needs.

Library Hours

September to May (subject to change)
Main Library
0730-2230, Monday to Thursday
0730-1700, Friday
0900-1700, Saturday and Sunday
For June, July and August hours, please call (604) 432-8557.

Telephone Numbers

Loans, overdue and hold information:
Tel. (604) 432-8370
Library hours:
Tel. (604) 432-8557
Reference service:
Tel. (604) 432-8371

Overdues, Fines, Replacement Policies

The purpose of fines is to protect the rights of all library users 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 for overdue material. The rates are 50 cents per day, and 50 cents per hour for reserve material.

Library Staff

Brigitte Peter-Cherneff, B.A., P.D.P., M.L.S., Institute Librarian
Yu Mei Choi, B.S.Sc., M.L.S., Cataloguer
Ana Ferrinho, B.A., M.L.S., Reference Librarian — Health/Distance Education Services
Anthony Kelly, B.A., M.L.S., Information Services Librarian, Reference — Trades
Frank Knor, Dipl.T., B.Ed., B.L.S., M.L.S., Systems Librarian, Reference — Computing
Linda Matsuba, B.Ed., M.L.S., Multi Campus Librarian, PMTC/Sea Island campuses — Electronics, Marine, Aviation.
Merilee MacKinnon, B.A., M.L.S., Media Librarian — Academic Studies
Robert A. Roy, B.A., M.A., B.L.S., Acquisitions/Serials Librarian
Gerry Weeks, B.A., B.L.S., M.L.S., Reference Librarian — Business/Current Awareness

SERVICES

MEDICAL SERVICES

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

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 test, 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. 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 (604) 432-8608.

FIRST AID

First aid attendants are on call as follows:

Emergency: (604) 432-8820
Non-emergency: (604) 432-8872
0700 - 2200 Monday to Friday
0800 - 1530 Saturday
Attendants are located in Building NE16

First aid attendants are on duty:

(a) If injury or health problem is life-threatening or if patient is otherwise immobile:
  (i) Call attendant as above giving precise location of patient;
  (ii) Call ambulance at 911 advising them to enter the campus via Willingdon/Goard Way;
  (iii) Call security at (604) 451-6856 (24 hrs.), give location of patient and request security to meet ambulance at Willingdon/Goard Way entrance and escort ambulance crew to patient.
(b) If patient is mobile, escort to first aid attendant in Building NE16.

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

0800-1600 Monday to Friday

CHILDCARE

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

The centre, designed by Mineo Tanaka Architects using a pre-manufactured building, is located in the SW7 building.

Research is underway to create additional facilities to include another centre for children aged 3-5 as well as a toddler centre to serve children aged 18 months to 3 years. Long-term goals for the year 2000 include additional centres for drop-in and flexible care.

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 (604) 432-8919.

HOUSING

The BCIT Housing and Residence office, located on the Burnaby campus, is available to assist students in finding suitable accommodation in the greater Vancouver area.

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

Address: 4200 Willingdon Avenue
Burnaby, BC
V5G 4J3

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

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

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 Campus Centre, recreational facilities and medical services. It accommodates 336 residents in seven low-rise, split level buildings. The buildings consist of townhouse 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.

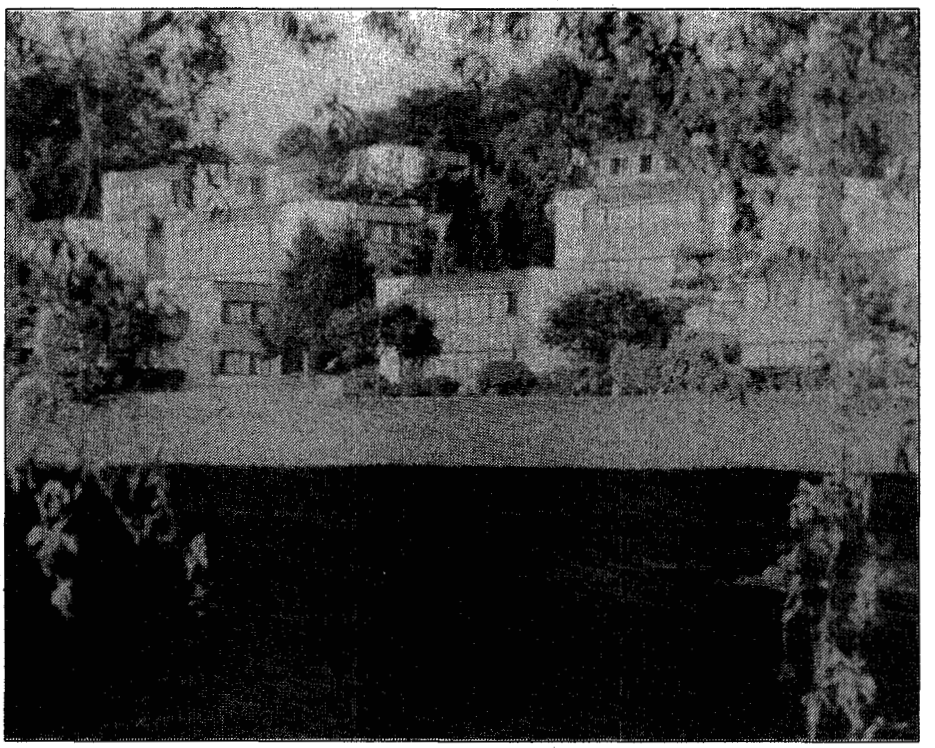
Each house has a residence advisor who is there to help with counselling and advice, in case of emergency and to facilitate social events.

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 1995/96 was $355 per month. This does not include meals, as students do their own cooking. Cost is subject to change.

SERVICES



How to Apply

When you are advised of your academic acceptance by BCIT, you will also receive a booklet entitled "Preparing for BCIT," which contains a pull-out 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

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 1995 were approximately:

Room and Board	$550
Room with Cooking Facilities	$350
Basement Suites (one bedroom)	$450
Apartments (one bedroom)	$550
Shared accommodation	$385

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 (604) 432-8677. Due to the high turnover of off-campus accommodation, long term 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 who are 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.

Family Housing

BCIT does not have residence accommodation for couples or families. The off-campus housing service includes listings appropriate for families.

FOOD SERVICES

Campus Café (SE12)	
Monday to Thursday	0700-2100
Friday	0700-1700
Saturday	0800-1430
Town Square Café, (SE2)	
Monday to Thursday	0700-2100
Friday	0700-1530
Saturday	CLOSED
E.T.C. Building (SE1)	
Monday to Thursday	0700-2100
Friday	0700-1530
Saturday	CLOSED
Road Runner (SW1, Room 2322)	
Monday to Thursday	0700-2100
Friday	0700-1530
Saturday	CLOSED
J.W. Inglis Building (NE1)	
Monday to Thursday	0700-2100
Friday	0700-1530
Saturday	0800-1300

Gourmet coffee, deli sandwiches, salads made to order and many other specialities 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 and is administered and controlled by Impark. All inquiries on parking, i.e. tickets, towing, etc., are to be directed to Impark at (604) 681-7311. The Parking Coordinator for BCIT is located in the Parking office on Goard Way, 0800 to 1600.
Tel: (604) 432-8719.

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/Impark do 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 continued on page 34

SERVICES

Parking continued from page 33

Parking for the Physically Challenged

Special parking arrangements are available by contacting the parking office, (604) 432-8719.

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 at (604) 451-6856, or using the emergency phones located throughout the campus.

SECURITY

The security office is located in SW1-1001, open 24 hours a day, 7 days a week. Security is responsible for:

- Escorts, call Security at (604) 451-6856
- Locking and unlocking schedules
- Lost and Found, call (604) 451-6856, located in SW1-1001
- Investigations of personal and property crimes
- Crime prevention programs
- Maintaining accessible statistics

Security can be contacted at (604) 451-6856, 24 hours a day, 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 number of zones travelled; passes are available from "This 'n That" stores on campus.

For information about bus routes, fares and schedules within the Vancouver Regional Transit System, call the Metro Transit Information line at (604) 521-0400. You can also pick up bus schedules for Greater Vancouver at the Maquinna Residence.

EMPLOYMENT PLACEMENT SERVICES (EPS)

Employment Placement Services assists BCIT students and alumni in finding part-time, summer, and career related full-time employment. The office is located in SW1, Room 1100.

Hours of operation
0900 - 1600, Monday to Friday

Staff

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

BOOKSTORE

Now open in the Campus Centre — Books for the *Real* World

- Generally open 0800-1600, Monday to Friday
- Closed Fridays from Victoria Day until after Labour Day.
- As there are many "ad hoc" extended openings, please call to verify hours.
- Your Burnaby campus source for texts designated essential for course use.
- Low-priced software (educationally priced, but full capacity) — proof of enrolment required.
- Special value packages for some leading business textbooks (text plus study guide) — subject to availability.
- For that little extra help: Schaum's Outlines, Computer reference books and many others.
- General school/office merchandise/ drafting supplies.
- There is always something on sale.
- Visa, MasterCard, American Express, personal cheques and Interac Direct. (Credit cards with magnetic stripe must be presented — account numbers alone will not be accepted.)
- Student accounts can be set up by companies or government agencies if billing/invoicing details are faxed to (604) 432-7923 prior to first class.

Satellite Locations

Although BCIT offers multi-campus opportunities for career classes, complete duplication of services is not possible. In cooperation with several BCIT partners, texts designated essential to course use will be sold at satellites during the first class.

As a limited number of texts are available, texts are reserved only for BCIT students enrolled in these classes at these satellite locations.

As satellite service is counter-based and labour intensive, used texts, special value packages, reference books and software are available only at the Burnaby bookstore.

The 3 R's of returns... Receipt/Registration/Resale

A full refund via cheque or Credit Card/ Interac reversal is possible if:

Receipt (original) — maximum 30 calendar days

Registration drop slip or note from instructor denoting reason for return: withdrawal, course cancellation, course credit or incorrect text.

Resale (like new) condition is important. Any markings (names, bent covers, grime, highlighting etc.) will result in a penalty of 25% so that the book can be resold at a used book price.

Software

- No returns on opened software or shrink-wrapped merchandise.
- You should never purchase software on speculation!

About Used Books

As there are many variables which determine resale value of a used book, there is no guarantee that a book will be purchased at the buyback.

- Course text changes or new editions occur frequently.
- Neither BCIT staff nor BCIT funds are used. As the buyback is managed under contract, the bookstore staff cannot answer questions about potential resale value.
- The concept is to get you into the store.
- Limited quantities of used books are available at term start-up. Personal shopping only.
- Used book buybacks are in September, January, and May. Please call for exact dates and times.

The *NEW* BCIT Bookstore — at the ♥ of the campus on Goard Way.

SERVICES

RECREATION AND ATHLETICS

BCIT has 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, which is used for many sports and recreational activities, and offers eight badminton, two basketball and three volleyball courts. Our activity room is equipped with a super circuit, weight training, and cardio area that 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 to Thursday	0700-2300
Friday	0700-2100
Saturday	0900-1700
Sunday	0900-1700
June-August:	TBA

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

Facilities and Services

All students 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 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

Courts may be booked in person or by phoning (604) 432-8612 up to seven days in advance. Rates are lower for students (BCIT ID is required) than for staff, part-time students, alumni or general public. Safety glasses are strongly recommended and equipment may be borrowed from the equipment office.

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 in or call the Recreation and Athletic Services office located in the lobby of the SAC building, telephone (604) 432-8287.

Intramurals

Leagues for volleyball, ice hockey, non-contact floor hockey, wallyball, and 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 ongoing during the school year. For further information, pick up one of our program guides.

SERVICES

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.

BCIT Student Fitness Incentive Program
"Be rewarded for your participation"
Fee: $9.00 BCIT Fitness T-shirt
$16.00 BCIT Fitness Sweatshirt
This program is sponsored by the Recreation & Athletic Department to encourage students to get fit by participating in fitness activities. This can include intramural programs, aerobic classes, use of the weight room or any fitness activity scheduled on or off campus. The participant must participate in a determined amount of fitness activities for the Semester. If you achieve your goal you will be awarded a T-shirt or sweatshirt for your dedication to achieving your goal. For further information contact the Recreation and Athletic Services Office in the SAC.

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 the Quintathlon is our major winter event. We can assist you to schedule noncompetitive tournaments within your technology or trade. If you have any interests that you feel may attract other students or staff, drop in or call the Recreation and Athletic Services office at (604) 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/$26.00.
Bonsor and C.G. Brown (Burnaby):
11 tickets/$16.00.
Eileen Dailly (Burnaby):
11 tickets/$21.00
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 Intercollegiate posters and to enquire at the Recreation Services office for practice times and locations.

Recreation and Athletic Services
(Program Office)
Tel. (604) 432-8287 or (604) 432-8282

Equipment Office and Attendants
(Racquet Court Bookings)
Tel. (604) 432-8612.

STUDENT ASSOCIATION
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 the Spring each year. BCIT students are invited to run for the following positions: President, VP Public Relations & Marketing, VP Finance & Administration, VP Student Affairs, Technical Sciences Chair, Business Chair, Trades Chair, Health Chair, and Campus Life Coordinator.

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, and many others.

The Student Association Campus Centre
The S.A. 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.

Childcare
The Student Association operates the model childcare facility on campus. The Centre provides a language-based program which encourages three to five-year-old children to express themselves creatively through a variety of learning circles and learning centres as well as positive social interaction.
Tel: (604) 432-8919.

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 and social issues. The Student Orientation Guide is also produced by The Link.
Tel: (604) 432-8935.

Student Assistance Fund
This 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.

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: (604) 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 more than 20,000 visitors.

SERVICES

Recreation
The Student Association provides support to assist the Recreation and Athletic department in promoting the concept of physical wellbeing 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; and general recreation.

Shinerama
Shinerama is a charity event held primarily in the month of September by post-secondary institutes all across Canada to raise funds for cystic fibrosis research. Coordinated by the C.F. Foundation, the BCIT Student Association operates and manages 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: (604) 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, The Brown Bag Restaurant, Elephant on Campus, Student Pub and Ano Computers.

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 with WordPerfect, PageMaker, Illustrator, FreeHand and MS Word on Mac and DOS. Tel: (604) 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: (604) 435-5131.

The BCIT Student Association Operates, Leases or Supports:
- Shinerama (Cystic Fibrosis Research)
- Campus Travel
- Environment Week
- Safety Program
- Tutoring
- Orientation Handbook
- Video Arcades
- Open House
- Elephant on Campus
- Ano Computers
- Dukes Cappuccino (SE16)
- This 'n That Stores (NE1, SW1, SE12)
- Winterfest (Student Assist. Fund)
- Recreation (SE16)
- Brown Bag Rest. (NE30)
- Childcare (SW7)
- The Link
- Vending Operations
- Copy Centre (SE14)
- Desktop Publishing (SE14)
- Scholastic Insurance

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. The Lost and Found is located in Building SW1, Room 1001, 24 hours a day.

LOCKERS
Lockers at BCIT are available to students on a first-come basis, except in programs with special requirements such as Forest Resources, Surveying and Building. Students should locate an unreserved locker near their program 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
1995/96 Alumni Association Executive
President: Guy Steeves
(Marketing Management '89)
Vice President: Bill MacPherson
(Business Administration '88 and Mechanical Systems '91)
Secretary: Derek Bell
(Civil and Structural '92)
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 twice a year. The Association assists with organizing reunions and offers group life insurance.

The Association's membership includes all Technology/Trades/Vocational graduates who have completed programs of at least six months' duration, and graduates of two-year Diploma of Technology programs. Membership is free of charge.

Priorities for the Alumni Association include involvement in fundraising for student scholarships and awards; the presentation of 11 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 new Student Association Campus Centre.
Tel. (604) 432-8847, Fax (604) 431-8911.

ADVANCEMENT BASED ON PERFORMANCE

WHY

OVER 100 FULL TIME CAREER POSITIONS AVAILABLE

JOIN THE PROFESSIONAL TEAM OF

FUTURE SHOP

DISCOUNT SUPERCENTERS

OPPORTUNITIES in:
Customer Service Reps.
Sales Representatives
Marketing Liaisons
Management Trainees

THE KEYS TO OUR SUCCESS.

NO EXPERIENCE NECESSARY
NEW GRADUATES WELCOME

1) Our Interactive style of management creates a secure atmosphere, builds team players and encourages you to become a member of our family.
2) Our product is entertaining and fun; it is easy to sell if communicating with people is your forte!
3) Our dynamic advertising campaign bring customers to us.
4) Our customer satisfaction policies are beyond comparison.
5) Our marketing strategy & product selection is focused to give our customers the best value for their money.
6) Our 3 steps paid intensive training program is unique: in our training centre you learn everything about our business before you go on the floor.
7) Our management in training (MIT) program prepares you to assume management responsibilities with a potential income of over $70,000 per annum (salary plus bonus).
8) Our huge expansion plan creates over 100 new opportunities; and our promotions from within policy allows you to climb the ladder of success quickly.
9) Our salespeople earned an average of over $30,000 per annum last year, with the top salespeople earning over $80,000.
10) Our extensive benefit package compares to any top notch companies.

FOR MORE INFORMATION PLEASE SEE YOUR LOCAL FUTURE SHOP STORE or CALL 431-5658 Monday thru Friday.

BUSINESS

SCHOOL OF BUSINESS

BUSINESS

ADMINISTRATION

Office of the Dean

Gordon Farrell, Dipl.T., M.B.A., Dean
Tel. (604) 432-8218
Jennifer Dueck, Administrative Assistant,
Tel. (604) 432-8598
Regina Trineer, Administrative Officer,
Tel. (604) 432-8575, Fax: (604) 436-0810

Administrative Management

Bachelor of Administrative Studies
Business Administration
Post-diploma Program
Post Diploma in Human Resource Management
Diploma in Human Resource Management
Administrative Management

Broadcast Communications

B. Antonson, Dipl.T., Associate Dean
Tel. (604) 432-8934, Fax: (604) 432-1792
Broadcast Journalism
Radio
Television

Financial Management

C.M. Briscall, B.Com., M.B.A., F.C.M.A.,
Associate Dean
Tel. (604) 432-8898, Fax: (604) 439-6700
Advanced Accounting
Corporate Finance
Financial Planning
Microfinancial Systems
Professional Accounting
Taxation

Marketing Management

R.W. Vandermark, B.A., Associate Dean
Tel. (604) 432-8382, Fax: (604) 439-6700
Marketing Communications
Real Estate Studies
Tourism Management
Professional Sales
Small Business Development

Operations Management

L. Shapiro, B.Sc., M.Sc., Associate Dean
Tel. (604) 451-6714, Fax: (604) 439-6700
International Trade
Operations Management
Senior Certificate for Trades
Transportation Logistics

For Information Sessions held throughout the year, contact Student Services at (604) 434-3304.

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 (604) 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:

			hrs/wk	credits
BUSA	5200	Business and Society	3.0	3.0
BUSA	6800	Strategic Management	3.0	3.0
ECON	5200	Intermediate Macroeconomic Analysis	3.0	3.0
ECON	6500	Managerial Economics	3.0	3.0
OPMT	5701	Calculus	4.0	4.0
OPMT	5740	Integrated Management Information Systems	3.0	3.0
OPMT	5751	Mathematical Models in Business	3.0	3.0
ORGB	5600	Management of Change	3.0	3.0

BCIT admission and registration procedures for the Bachelor of Administrative Studies Degree are offered in collaboration with the Open University.

These procedures apply to BCIT Business Diploma graduates who wish to embark on the Open University's Administrative Studies Degree Completion program, granted by the OLA's Open University. Please refer to the Open University for their admission procedures as they are an integral part of your admission and registration into this program. OU admission information can be obtained from BCIT Student Services at (604) 434-3304 or from OU Educational Access Services at (604) 431-3300.

1. You must first establish your Program Plan with the Open University

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 an Application for full-time Admission together with a copy of your Open University 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, e.g.: 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 University or through other accredited universities and colleges with a letter of permission from OU. 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:

			hrs/wk	credits
BUSA	5200	Business and Society	3.0	3.0
BUSA	6800	Strategic Management	3.0	3.0
ECON	5200	Intermediate Macroeconomic Analysis	3.0	3.0
ECON	6500	Managerial Economics	3.0	3.0
OPMT	5701	Calculus	4.0	4.0
OPMT	5740	Integrated Management Information Systems	3.0	3.0
OPMT	5751	Mathematical Models for Business	3.0	3.0
ORGB	5600	Management of Change	3.0	3.0

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 enrol in one of three programs: Radio, Television or Broadcast Journalism.

Job Opportunities
Graduates are employed throughout British Columbia and in all parts of the world, wherever radio, television, cable facilities, audio and video production operations exist. Graduates find employment in entry-level positions including: radio on-air host (disc jockey), commercial copywriter, audio producer, sales/marketing/promotion representative, videotape editor, ENG/EFP camera operator, production assistant, feature editor/reporter, researcher, news reporter, freelance video/film staff, scriptwriter, media relations, etc.

Radio
This program provides detailed and intensive training in radio operations and programming. 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, promotion, management and news. Full digital facilities provide training on current industry equipment. Students 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 the Lower Mainland) in second year.

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, cable television operations and as freelancers.

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 and general knowledge/English tests, and computer fluency requirements (see prerequisites). 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.

Students must participate in a series of industry work experience assignments and field trips to local and provincial broadcast and related-operations facilities during their tenure in all Broadcast Communications programs.

Program Length
Two years, full-time beginning in September each year.

BUSINESS

Prerequisites

High school graduation with English 12. All applicants for any Broadcast Communications program must provide proof of basic computer literacy, either by providing evidence of having successfully completed a basic introductory computer course, or by demonstrating possession of equivalent competence by completing a challenge exam prior to being selected. Details are available at entrance examination sessions. Keyboarding speed must be 25 words per minute or better. 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 career goals and reasons for choosing broadcasting as a career. This essay must accompany the application, together with all pertinent documents, letters of reference, recommendations, school and university/college transcripts, etc., including 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. (When 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.

Program: RADIO

Level 1 (15 weeks)

			hrs/wk	credits
BCST	1100	Industry Operations	2.0	2.0
BCST	1101	Technical Introduction	3.0	3.0
BCST	1103	Copywriting 1	3.0	3.0
BCST	1110	Radio Programming and Operations 1	8.0	8.0
BCST	1111	Radio Announcing 1	6.0	6.0
BCST	1112	Contemporary Issues 1	2.0	2.0
BCST	1113	Introduction to Radio News 1	2.0	2.0
BUSA	1200	Business Concepts	3.0	3.0
COMM	1112	Communication for Broadcasters	3.0	3.0

Level 2 (16 weeks plus 4 week practicum)

BCST	2203	Copywriting 2	3.0	3.0
BCST	2209	Practicum 1	11.5	
BCST	2210	Radio Programming and Operations 2	8.0	8.0
BCST	2211	Radio Announcing 2	6.0	6.0
BCST	2212	Contemporary Issues 2	2.0	2.0
BCST	2213	Introduction to Radio News 2	2.0	2.0
BCST	2214	Music and Programming	2.0	2.0
BLAW	3300	Broadcast Law	3.0	3.0
COMM	2212	Communication for Broadcasters	3.0	3.0

Level 3 (15 weeks)

BCST	3303	Copywriting 3	3.0	3.0
BCST	3310	Radio Programming and Operations 3	16.0	16.0
BCST	3312	Marketing, Sales and Promotion	2.0	2.0
BCST	3315	Feature Program Production 1	2.0	2.0
BCST	3316	Audio Production	2.0	2.0
OPMT	1319	Statistics for Broadcasters	2.0	2.0
ORGB	2510	Interpersonal Relationships	3.0	3.0

Level 4 (16 weeks plus 4 week practicum)

			hrs/wk	credits
BCST	4403	Copywriting 4	3.0	3.0
BCST	4409	Practicum 2	11.5	
BCST	4410	Radio Programming and Operations 4	25.0	25.0
BCST	4415	Feature Program Production 2	2.0	2.0

Program: TELEVISION

Level 1 (15 weeks)

BCST	1100	Industry Operations	2.0	2.0
BCST	1101	Technical Introduction	3.0	3.0
BCST	1120	Television Introduction 1	10.0	10.0
BCST	1124	Writing for Television	3.0	3.0
BCST	1223	Television Production Planning	3.0	3.0
COMP	1107	Computers in Broadcasting	3.0	3.0
COMM	1112	Communication for Broadcasters 1	3.0	3.0
ECON	1150	Economic Issues	3.0	3.0
ORGB	2510	Interpersonal Relationships	3.0	3.0

Level 2 (16 weeks coursework plus 4 week practicum)

BCST	1221	Visual Fundamentals for Television	2.0	2.0
BCST	2209	Practicum 1		11.5
BCST	2220	Television Introduction 2	17.0	17.0
BCST	2222	Theory of Colour Television Systems	3.0	3.0
BCST	2224	Dramatic Writing for Television	3.0	3.0
BLAW	3300	Broadcast Law	3.0	3.0
COMM	2212	Communication for Broadcasters 2	3.0	3.0

Level 3 (15 weeks)

BCST	3320	Television Production 1	18.0	18.0
BCST	3322	Television News	4.0	4.0
BCST	3325	ENG Production 1	4.0	4.0
COMM	3312	Corporate Writing in Television		

Level 4 (16 weeks coursework plus 4 week practicum)

			hrs/wk	credits
BCST	4409	Practicum 2		11.5
BCST	4420	Television Production 2	18.0	18.0
BCST	4425	ENG Production 2	4.0	4.0
COMM	4412	Project Writing in Television	3.0	3.0

Program: BROADCAST JOURNALISM

Level 1 (15 weeks)

BCST	1100	Industry Operations	2.0	2.0
BCST	1130	Introduction to News Reporting	2.0	2.0
BCST	1131	Introduction to Announcing	3.0	3.0
BCST	1132	Introduction to Radio	3.0	3.0
BCST	1134	News Writing	4.0	4.0
BCST	1135	Municipal Government	2.0	2.0
BCST	1137	Visual Fundamentals for Journalists	2.0	2.0
COMM	1112	Communication for Broadcasters 1	3.0	3.0
ECON	1150	Economic Issues	3.0	3.0

Level 2 (16 weeks coursework plus 4 week practicum)

BCST	1331	Media Law	2.0	2.0
BCST	2209	Practicum 1		11.5
BCST	2230	News Reporting	2.0	2.0
BCST	2231	Announcing for Journalists	4.0	4.0
BCST	2232	Radio News 2	6.0	6.0
BCST	2233	Television News 2	4.0	4.0
COMM	2212	Communication for Broadcasters 2	3.0	3.0
COMP	1107	Computers in Broadcasting	3.0	3.0

Level 3 (15 weeks)

BCST	1431	Labour and Business	2.0	2.0
BCST	3332	Radio News 3	10.0	10.0
BCST	3333	Television News 3	10.0	10.0

Level 4 (16 weeks coursework plus 4 week practicum)

			hrs/wk	credits
BCST	1235	Government and Politics	2.0	2.0
BCST	3336	Advanced News Writing	2.0	2.0
BCST	4409	Practicum 2		11.5
BCST	4430	Investigative Reporting	2.0	2.0
BCST	4432	Radio News 4	10.0	10.0
BCST	4433	Television News 4	10.0	10.0

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 — 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 — Introduces 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 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 — Introduces 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 — Introduces 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 — Demonstrates how essential it is for a broadcaster to exhibit 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 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) Video Basics — Teaches 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 1124 Writing for the Television — Introduces the fundamentals of copywriting for television. Students learn to create a variety of appeals for a product or service. They also learn about television audiences and how television advertising works.

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 — Introduces 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 — Introduces Broadcast Journalism students 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 rewriting practice for both media. The course relies heavily on in-class practice and critique.

BCST 1135 (BCST 135) Municipal Government — 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 — Examines 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 — Teaches the student to plan all the elements necessary to guarantee a production that meets the professional standards of the television production industry, as well as organize and conduct pre and post-production meetings as the producer/director of a program.

BCST 1235 (BCST 235) Government and Politics — 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 — Trains a broadcaster 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 — Provides students with 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 — Continues from BCST 1103. Prerequisite: BCST 1103.

BCST 2209 (BCST 209) Practicum 1 — Presents 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. Prerequisite: Journalism: None; Radio: BCST 2210, BCST 2211; Television: BCST 2220.

BCST 2210 (BCST 210) Radio Programming and Operations 2 — Continues from BCST 1110, the major emphasis is on honing the technical operations skills learned in first term. Commercial production, radio station operations, audition tapes, and the use of light-weight, portable equipment are topics for instruction in this term. Emphasis is placed on practical applications of theory. Prerequisite: BCST 1110.

BCST 2211 (BCST 211) Radio Announcing 2 — Strengthens effective oral communication of ad-lib and written material, along with timing, upgrading 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 — Builds on the knowledge base attained in first term seminars, lectures and oral communication exercises to 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 — 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.

BCST 2220 (BCST 220) Video Production — See BCST 1120. Prerequisite: BCST 1120.

BCST 2222 (BCST 222) Theory of Colour Television Systems — Begins with the psychophysics of human vision and explains how the eye perceives and adapts to colour. This theory is applied to the NTSC system. The colour TV signal path, from the camera through production and measuring equipment to final display, is explained. Prerequisite: BCST 1101.

BCST 2224 Dramatic Writing for Television — Introduces the fundamentals of dramatic writing. Students generate original story ideas and then develop one idea from concept through to a first draft film or television script. Writing assignments also include character sketches and a story treatment.

BCST 2230 (BCST 230) News Reporting — Involves the student 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 — Presents, after initial voice training in term one, 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 — Presents 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 — Teaches 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 and BCST 1134.

BCST 3303 (BCST 303) Copywriting 3 — Presents 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 — Applies the basic competence in radio broadcasting techniques 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; 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 2210, 2211.

BCST 3312 (BCST 312) Radio Marketing, Sales and Promotion — Covers 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 2210, 2211.

BCST 3315 (BCST 315) Feature Program Production 1 — Presents an assignment-oriented course that 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 — Presents an assignment-oriented course that 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) Video Production 1 — Allows students 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 demands of a variety of program formats. Students will assume all managerial, production and support function responsibilities. Prerequisite: BCST 2220.

BCST 3322 (BCST 322) Television News — Teaches more sophisticated visual techniques that are put to use in the daily preparation of Electronic News Gathering stories. Lectures are interspersed with weekly newscasts throughout the term. Prerequisite: BCST 2209.

BCST 3325 (BCST 325) News Shooting and Editing 1 — Designed to further acquaint television students with the electronic news gathering skills learned in the first-year TV Practicum. Students will gain a wide range of experience both as camera operators 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 — Begins structured newsroom operations. Students 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 — Allows students to 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 — Continues from the work started in BCST 3303. Prerequisite: BCST 3303.

BCST 4409 (BCST 409) Practicum 2 — Allows students to locate 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 — Uses 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 3310.

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

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

BCST 4425 (BCST 425) News Shooting and Editing 2 — Fine-tunes the electronic news gathering skills gained in BCST 3225.

BCST 4430 (BCST 430) Investigative Reporting — Prepares students 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.

BCST 4432 (BCST 432) Radio News 4 — Presents an 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 — Continues from 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 — Introduces the Canadian legal system, emphasizing contracts, torts (including defamation and privacy), criminal law, court procedure and contempt, secured transactions, government agencies, employment law, forms of doing business, negotiable instruments and other topics applicable to broadcast business.

BUSA 1200 (ADMN 115) Business Concepts — 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 — Examines, through lectures, labs and industry examples, 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 — Continues from 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) Corporate Writing for Television — Emphasizes 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) Project Writing for Television — Emphasizes 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 3312.

COMP 1107 (COMP 112) Computers in Broadcasting — Includes 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 — Presents 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 — Explores the importance of harmonious relationships and methods for achieving them. Broadcasting involves unusually close interaction among its participants who work together to provide information, entertainment and revenues.

BUSINESS

Faculty and Staff

B. Antonson, Dipl.T., Associate Dean
B. Amos, B.A.
J.W. Ansell, Dipl. T., Program Head, Radio
Y. Eamor, Program Head, Broadcast Journalism (on leave)
T. Handel, Dipl. T., Dipl. Adult Education (on leave)
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, I.D., A.E.D.
R. Riskin, Dipl. T., Program Head, Television
R. Taylor, B.Ed.
R. Piercey, Acting Program Head, Broadcast Journalism

Advisory Committee: Radio

Dale Buote, Program Director, CKKS-FM Radio
Jan Evanski, Creative Director, CKNW Radio
Nick Frost, President & General Manager SILK Broadcasting Ltd., Kelowna
Ken Kilcullen, Program Director CKPG, Prince George
Gary Milne, General Sales Manager, CKWX, Vancouver
Doug Ozeroff, Program Director, CJAT Trail
Erin Petrie, (Chairperson), General Manager, Satellite Radio Network, Vancouver
Brad Phillips, Program Director, CISL/CKZZ Vancouver
Peter Schell, Manager of Technical Services, CBC Radio, Vancouver
Nancy Wall, Marketing Representative, CFUN Vancouver

Advisory Committee: Television

Chris Wilson (Chairperson), Freelance Production
Barry Chambers, General Manager, Gastown Post & Transfer
Martyn Stubbs, Program Manager, Shaw Cable 4
Don Thompson, General Manager, Finale Productions
Rick Beal, Assistant Manager, TV Technical Services, CBC British Columbia
Rob Weller, Production Manager, CHBC-TV Kelowna
Mike Potter, Operations Manager, KNOW
Dave Sherwood, Creative Director, CKPG-TV Prince George
John Thomas, Vice President & General Manager, Delta Cable
Martin Truax, Program Director, Rogers Cable Vancouver
Valerie Newson, Legal Assistant, Western International Communications
Wayne Carlow, Audiovisual Program Producer, BC Hydro
Terry Brady, Assistant Manager-Operations, CKVU-TV Vancouver
Dave Calder, Okanagan Skeena Group
Terry Mahoney, Operations Manager, CHBC-TV Kelowna

Advisory Committee: *Broadcast Journalism*

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Tony Parsons, BCTV Vancouver
Wayne Williams, Assignment Editor, CBC TV Vancouver
Mike Woodworth, News Director, CKPG Radio/TV Prince George
Steve Wyatt, Senior Producer, BCTV Vancouver
Gordon Vizzutti, News Director, CHBC TV Kelowna

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.

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 an introduction to current business practice preparing them to apply a disciplined and professional approach to management. Lectures are supplemented by case studies and group discussions throughout the program.

Program Length

Nine months, full-time beginning in September each year.

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.

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BUSINESS

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Program: BUSINESS ADMINISTRATION

Level 1 (15 weeks)		hrs/wk	credits
BLAW 3100	Business Law	4.0	4.0
BUSA 3510	Management Science	3.0	3.0
BUSA 3700	Microcomputer Software Systems	3.0	3.0
COMM 3310	Advanced Communication for Business Administration	4.0	4.0
ECON 2100	Microeconomics	3.0	3.0
FMGT 1110	Financial Management 1	4.0	4.0
OPMT 1510	Business Mathematics	4.0	4.0
ORGB 2100	Organizational Behaviour	2.0	3.0

Level 2 (20 weeks)			
BUSA 4610	Microcomputer Software Applications	3.0	4.0
BUSA 4810	Management Policy	4.0	5.5
COMP 2180	Computers and Information Systems	4.0	5.5
ECON 2200	Macroeconomics	3.0	4.0
FMGT 2110	Financial Management 2	4.0	5.5
HRMG 3010	Human Resource/ Industrial Relations Management	3.0	4.0
MKTG 1113	Introduction to Marketing	3.0	4.0

Course Descriptions

BLAW 3100 (ADMN 385) Business Law — Presents 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 and business organizations. 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.

BUSA 3510 (ADMN 511) Management Science — Emphasizes the use of decision-making models in business. It 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 — Introduces 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 — Continues from 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 their use in other course areas. Prerequisite: BUSA 3700.

BUSA 4810 (ADMN 611) Management Policy — Presents 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 among these fields.

COMM 3310 (BCOM 302) Advanced Communication for Business Administration — Emphasizes persuasive writing and speaking skills, especially proposal writing. Students learn to retrieve, extract and report information efficiently. Building on skills acquired in previous communication courses.

COMP 2180 (COMP 213) Computers and Information Systems — Presents 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 4610.

ECON 2100 (ADMN 100) Microeconomics — Covers 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 1110 (FMGT 519) Financial Management 1 — Covers basic accounting procedures; closing the books; adjustments; working papers; merchandise operations; statement and ledger organization; special journals; forms of business organization; accounting principles; accounting for cash, accounts receivable, inventory and capital assets; analysis of financial data and financial statements.

FMGT 2110 (FMGT 619) Financial Management 2 — Covers managerial accounting, cost terms; planning and control; using cost data in decision making. Specific topics include job order costing, process costing, cost behaviour, cost-volume-profit analysis, standard costs, budgeting, pricing products and services, relevant costs and capital budgeting. Prerequisite: FMGT 1110.

HRMG 3010 (ADMN 342) Human Resource/Industrial Relations Management — Introduces 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 — Introduces 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 — Reviews 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 Behaviour — Presents the study of factors that either influence people 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.B.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., Program Head
C.L.R. Jaques, B.A., M.A.
L. Jones, B.Sc., M.Sc.
T.P. Juzkow, B.A.Sc., M.B.A., P.Eng.
R. Kessler, M.A., B.Comm.
F. Mandl, B.Sc., M.B.A.
D. Pepper, B.A., M.Sc., Ph.D., Program Head
W. Ratzburg, B.Sc., Dip.Ed., M.B.A.
S. Scott-Hallam, B.Sc., M.B.A.
R.M. Sharp, B.A.Sc., M.B.A., P.Eng.
G. Storey, B.A., M.Sc.
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.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 Corporate Finance program emphasizes the finance function of a corporation; topics include banking, venture capital, international finance and hedging through financial derivatives. The program will be of interest to those students who will be seeking employment in the finance department of an enterprise.

The Financial Planning program will be of interest to those students who are interested in the retail side of financial planning. The objective of the program is to equip those students enrolled with the basic skills and knowledge necessary to provide individual or personal financial advice in such areas as : taxation, investments, estate and retirement planning.

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 $3,000 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;
- ***Corporate Finance***—Enterprise Finance, Investment Banking, Security Analysis and Money and Banking;
- ***Financial Planning***—Security Analysis, Money and Banking and Financial Planning

Program Length

Two years, full-time beginning in September each year.

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 subjects offered in the program. The Canadian Institute of Chartered Accountants, the Certified General Accountants' Association of Canada, 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 this program will write the Canadian Securities Course examination while they are students at BCIT. Successful completion is a mandatory step for anyone considering a career in a financial planning field or indeed any aspect of the investment world. In addition, it is a prerequisite course for all the other courses and programs offered by the Canadian Securities Institute.

BUSINESS

Technology: FINANCIAL MANAGEMENT

Level 1 (15 weeks)		hrs/wk	credits
BUSA 1100	Management	3.0	3.0
COMM 1100	Business Communication	3.0	3.0
COMP 1104	Introduction to Computing	3.0	3.0
ECON 2100	Microeconomics	3.0	3.0
FMGT 1105	Accounting 1	3.0	3.0
MKTG 1102	Essentials of Marketing	3.0	3.0
OPMT 1110	Business Mathematics	3.0	3.0

Level 2 (20 weeks)		hrs/wk	credits
COMM 2200	Business Communication 2	3.0	4.0
COMP 2125	Computers in Business	3.0	4.0
ECON 2200	Macroeconomics	3.0	4.0
FMGT 2105	Accounting 2	3.0	4.0
FMGT 2540	Working Capital Management (10 weeks)	3.0	2.0
FMGT 2710	Computerized Accounting (10 weeks)	3.0	2.0
FMGT 2910	Finance Reports (10 weeks)	3.0	2.0
OPMT 1130	Business Statistics	4.0	5.5
ORGB 2100	Organizational Behaviour (10 weeks)	3.0	2.0

Normally, students will not be allowed to proceed into second-year Financial Management unless they have achieved at least 65% in FMGT 2105 or 70% in FMGT 2100.

Program: PROFESSIONAL ACCOUNTING

Level 3 (15 weeks)		hrs/wk	credits
BLAW 3100	Business Law	4.0	4.0
FMGT 3110	Financial Accounting 1	5.0	5.0
FMGT 3210	Cost & Managerial Accounting 1	4.0	4.0
FMGT 3310	Auditing 1	3.0	3.0
FMGT 3410	Taxation 1	4.0	4.0
FMGT 3510	Finance 1	4.0	4.0
FMGT 3720	Advanced Microcomputer Applications 1	4.0	4.0

Level 4 (20 weeks)			
FMGT 4110	Financial Accounting 2	5.0	7.0
FMGT 4210	Cost & Managerial Accounting 2	4.0	6.0
FMGT 4310	Auditing 2	4.0	5.5
FMGT 4410	Taxation 2	4.0	5.5
FMGT 4510	Finance 2	4.0	6.0
FMGT 4620	Security Fundamentals	4.0	2.5
FMGT 4710	Microcomputer Systems 2	4.0	5.5
FMGT 4910	Projects in Industry	4.0	2.5

BUSINESS

Program: ADVANCED ACCOUNTING

Level 3 (15 weeks)		hrs/wk	credits
BLAW 3100	Business Law	4.0	4.0
FMGT 3110	Financial Accounting 1	5.0	5.0
FMGT 3210	Cost and Managerial Accounting 1	4.0	4.0
FMGT 3310	Auditing 1	3.0	3.0
FMGT 3410	Taxation 1	4.0	4.0
FMGT 3510	Finance 1	4.0	4.0
FMGT 3720	Advanced Microcomputer Applications 1	4.0	4.0

Level 4 (20 weeks)			
FMGT 4110	Financial Accounting 2	5.0	7.0
FMGT 7120	Advanced Accounting	4.0	5.5
FMGT 4210	Cost and Managerial Accounting 2	4.0	6.0
FMGT 4310	Auditing 2	4.0	5.5
FMGT 4410	Taxation 2	4.0	5.5
FMGT 4510	Finance 2	4.0	6.0
FMGT 4710	Microcomputer Systems 2	4.0	5.5

Program: TAXATION

Level 3 (15 weeks)			
BLAW 3100	Business Law	4.0	4.0
FMGT 3110	Financial Accounting 1	5.0	5.0
FMGT 3210	Cost and Managerial Accounting 1	4.0	4.0
FMGT 3310	Auditing 1	3.0	3.0
FMGT 3410	Taxation 1	4.0	4.0
FMGT 3510	Finance 1	4.0	4.0
FMGT 3720	Advanced Microcomputer Applications 1	4.0	4.0

Level 4 (20 weeks)		hrs/wk	credits
FMGT 4110	Financial Accounting 2	5.0	7.0
FMGT 4210	Cost and Managerial Accounting 2	4.0	6.0
FMGT 4310	Auditing 2	4.0	5.5
FMGT 4410	Taxation 2	4.0	5.5
FMGT 4510	Finance 2	4.0	6.0
FMGT 4620	Security Fundamentals	4.0	2.5
FMGT 4710	Microcomputer Systems 2	4.0	5.5
FMGT 4750	Advanced Microcomputer Applications 2	4.0	2.5

Program: CORPORATE FINANCE

Level 3 (15 weeks)			
BLAW 3100	Business Law	4.0	4.0
FMGT 3110	Financial Accounting 1	5.0	5.0
FMGT 3210	Cost and Managerial Accounting 1	4.0	4.0
FMGT 3410	Taxation 1	4.0	4.0
FMGT 3510	Finance 1	4.0	4.0
FMGT 3610	Security Analysis 1	4.0	4.0
FMGT 3720	Advanced Microcomputer Applications 1	4.0	4.0

Level 4 (20 weeks)			
FMGT 4110	Financial Accounting 2	5.0	7.0
FMGT 4210	Cost and Managerial Accounting 2	4.0	6.0
FMGT 4410	Taxation 2	4.0	5.5
FMGT 4510	Finance 2	4.0	6.0
FMGT 4520	Enterprise Finance	4.0	2.5
FMGT 4531	Investment Banking	4.0	2.5
FMGT 4570	Money and Banking	4.0	5.5
FMGT 4710	Microcomputer Systems 2	4.0	5.5

Program: FINANCIAL PLANNING

Level 3 (15 weeks)		hrs/wk	credits
BLAW 3100	Business Law	4.0	4.0
FMGT 3110	Financial Accounting 1	5.0	5.0
FMGT 3210	Cost and Managerial Accounting 1	4.0	4.0
FMGT 3410	Taxation 1	4.0	4.0
FMGT 3510	Finance 1	4.0	4.0
FMGT 3610	Security Analysis 1	4.0	4.0
FMGT 3720	Advanced Microcomputer Applications 1	4.0	4.0

Level 4 (20 weeks)			
FMGT 4110	Financial Accounting 2	5.0	7.0
FMGT 4210	Cost and Managerial Accounting 2	4.0	6.0
FMGT 4410	Taxation 2	4.0	5.5
FMGT 4510	Finance 2	4.0	6.0
FMGT 4525	Financial Planning	4.0	5.5
FMGT 4570	Money and Banking	4.0	5.5
FMGT 4710	Microcomputer Systems 2	4.0	5.5

Course Descriptions

BLAW 3100 (ADMN 385) Business Law — Presents a one-term, condensed course that 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 — Presents 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.

BUSINESS

COMM 1100 (BCOM 100) Business Communication 1 — Designed to give students basic listening, writing, and speaking skills that 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 — 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 — Uses lectures and practical exercises 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 — Covers 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 1105 (FMGT 101) Accounting 1 — Designed to provide Financial Management students with a theoretical and practical foundation in basic accounting and as a preparation for FMGT 2105. Topics include an introduction to accounting theory; income measurement; record-keeping procedures; adjusting and closing entries; financial statement preparation; the accounting cycle; merchandising accounting; inventory costing; accounting systems; cash.

FMGT 2105 (FMGT 201) Accounting 2 — Continues from FMGT 1105. Topics include temporary investments; receivables, capital assets; liabilities; partnerships; corporations; bonds; statements of changes in financial position; financial statement analysis; manufacturing accounting; departmental accounting; cost-volume-profit analysis. Prerequisite: FMGT 1105.

FMGT 2540 (FMGT 293) Working Capital Management — Enables 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 1105.

FMGT 2710 (FMGT 292) Computerized Accounting — Presents a practical, specialist course for Financial Management students with an introductory financial accounting background. This subject begins with completion of a manual practice set and ends with completion of a series of exercises which employ a basic Debit/Credit software package. The work done includes conversion from manual to computer accounting, General Ledger, Accounts Receivable, Accounts Payable, Payroll and System modules. One major integrating assignment will be completed using the software. Prerequisite: FMGT 1105.

FMGT 2910 (FMGT 291) Finance Reports —Provides 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 1105.

FMGT 3110 (FMGT 302) Financial Accounting 1 — Allows 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 or 2105 or 2190.

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, 2105, 2180 or 2190.

FMGT 3310 (FMGT 310) Auditing 1 — Discusses auditing principles and generally accepted auditing standards. Students study the meaning and purpose of the audit function and are introduced to techniques and procedures. Topics include history or auditing, professional ethics, internal control, auditing EDP systems, audit evidence, legal liability, audit working papers. Prerequisite: One of FMGT 2100, 2105, 2180 or 2190.

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, property income and capital cost allowance rules. Capital gains rules will be introduced if time permits. Prerequisite: One of FMGT 2100, 2105, 2180 or 2190.

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, financial statement analysis; principles of valuation in finance; valuing debt and equity; capital budgeting; risk and return in the capital markets. Prerequisite: One of FMGT 2100, 2105, 2180 or 2190.

FMGT 3610 (FMGT 308) Security Analysis 1 — Introduces investments. The Financial Management Technology has entered into a partnership with the Canadian Securities Institute; this course, a product of the partnership, is the CSI's Canadian Securities Course. Topics include the nature of marketable securities, factors which influence their price and a review of the various methods employed to evaluate their worth. In addition, the operation of stock exchanges and investment dealers and the regulatory environment in which these institutions operate is discussed. Finally, the purpose and function of the Investment Dealers Association is examined with a particular focus on the role it plays in the establishment of standards of conduct of licensed stock brokers. Successful completion of the course earns the student credit for the CSC with the Securities Institute. Prerequisite: One of FMGT 2100, 2105, 2180 or 2190.

FMGT 3720 (FMGT 323) Advanced Microcomputer Applications 1 — Allows students to develop expertise in the AccPac accounting software package. In addition to G/L, A/R and A/P modules, the students will use the Financial Reporter to design custom statements. 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 operating asset acquisition and disposal including associated valuation and income measurement problems, short and long-term debt, shareholders' equity accounts (including consolidations), income tax allocation, cash flow statements, leases and accounting for errors and changes. Prerequisite: FMGT 3110.

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

FMGT 4310 (FMGT 401) Auditing 2 — Continues from 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. Review engagements and compilation engagements are also discussed. A short audit case will be undertaken. Prerequisite: FMGT 3310.

FMGT 4410 (FMGT 409) Taxation 2 — Expands the students' study of Canadian income tax begun in FMGT 3410, including the complexities and problem areas involved in tax planning. Topics include capital gains rules and tax computations for individuals (including proprietors and partners), corporations and trusts. Corporate surplus distributions, international income, assessment (including returns, appeals, reassessment and payment) and GST are also introduced. Prerequisite: FMGT 3410.

FMGT 4430 (FMGT 429) Selected Topics in Tax — Covers topics in taxation that are either not covered in Taxation 1 and 2 or not covered in depth. Topics have included GST, buying and selling a business, taxation of high technology corporations, taxation in the mining and forestry industries, U.S. taxation and an insight into Revenue Canada. Prerequisite: FMGT 3410.

FMGT 4510 (FMGT 404) Finance 2 — Continues where FMGT 3510 left off and focuses on: sources of short, medium and long-term financing; sources and techniques of long and medium-term financing; cost of capital and the optimum capitalization of a firm; working capital management; financial derivatives and hybrids. 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 4525 Financial Planning — Equips the student with the basic knowledge and skills necessary to provide advice of a financial nature to individuals. The primary topics include taxation, risk management, pension plans, trusts, investments and estate planning. Prerequisite: FMGT 3610.

FMGT 4531 (FMGT 445) Investment Banking — Covers 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 4620 (FMGT 412) Security Fundamentals — Introduces the fundamentals of investing including market mechanics, the investment setting, technical and fundamental analysis of common stock, preferred stock and corporate bonds. Prerequisite: One of FMGT 2100, 2105, 2180 or 2190.

FMGT 4710 (FMGT 407) Microcomputer Systems 2 — Continues from FMGT 3720 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 3720.

FMGT 4750 Advanced Microcomputer Applications 2 — Begins with an evaluation of the needs of a small business and will progress through the various stages. Students will also learn the payroll cycle including submissions to government. Students will prepare a mini research paper into a current topic in computer technology. Prerequisite: FMGT 3720.

FMGT 4910 (FMGT 411) Projects in Industry — Presents an experiential course for students in the Professional Accounting and Microfinancial programs. Level 4 students form syndicates and carry out a real problem-solving assignment. Projects can be either in government or private sector settings and may be identified by the syndicate or chosen from projects solicited by the department. Each project will be supervised by a faculty member. Prerequisite: Completion of Level 3.

FMGT 7120 (FMGT 711) Advanced Accounting — Reviews 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 subsidiaries (both in the year of acquisition and in subsequent years). Accounting for foreign currency transactions/translations will also be studied, along with partnership accounting, branch accounting and receivership/bankruptcies. Prerequisite: FMGT 3110.

MKTG 1102 (MKTG 102) Essentials of Marketing — 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 — Reviews 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 preprogrammed calculator, and practical application from the field of financial management.

OPMT 1130 (OPMT 132) Business Statistics — Enables 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 Behaviour — Studies 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

C.M. Briscall, B.Com., M.B.A., F.C.M.A., Acting Associate Dean
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H.B. Yackness, B.Com., M.B.A., C.A., Program Head

Advisory Committee Members

D. Hincks, McDonald's Restaurants of Canada Ltd., Chair
A. J. Barnard, Government of B.C.
P. Bower, The Certified General Accountants Association of B.C.
C. Breining, MacMillan Bloedel Limited
D. G. A. Carter, The Institute of Chartered Accountants of British Columbia
V. Cinnamon, Cinnamon, Jang, Willoughby & Co.
R. Clark, Rogers Cantel Incorporated
A. Finan, Canadian Bankers Association
J. A. Gardiner, Price Waterhouse Chartered Accountants
W. E. Gibson, Vancouver Financial Planning Consultants Inc.
S. King, Deloitte & Touche
K. G. Lohn, Lohn Caulder Chartered Accountants
C. MacKenzie, B.C. Telephone Company
J. McCormack, Snowsell Jennens & Carter (Kelowna, B.C.)
B. Murchie, House of Brussels Chocolates
T. Northup, Laurentian Pacific Insurance Company
P. Norwood, The Society of Management Accountants of British Columbia
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 Limited
B. Wolverton, Wolverton Securities Ltd.

BUSINESS

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 that focus upon enhancing human behaviour 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, teamwork, 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 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.

Prerequisites

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

Program: HUMAN RESOURCE MANAGEMENT

Level 1 (15 weeks)		hrs/wk	credits
BLAW 3100	Business Law	3.0	3.0
BUSA 3600	Microcomputer Applications 2 (Databases)	3.0	3.0
FMGT 3560	Finance 1	4.0	4.0
HRMG 3150	Human Resource Management Systems 1	3.0	3.0
HRMG 3170	Human Resource Dynamics Workshop	3.0	3.0
HRMG 3200	Industrial Relations	4.0	4.0
HRMG 3401	Benefits Administration	3.0	3.0
OPMT 1510	Business Mathematics	4.0	4.0
Level 2 (20 weeks)			
ECON 2200	Macroeconomics	3.0	4.0
FMGT 4560	Finance 2	4.0	6.0
HRMG 3300	Recruitment and Selection*	4.0	2.5
HRMG 3500	Training and Development*	4.0	2.5
HRMG 4150	Human Resource Management Systems 2*	4.0	2.5
HRMG 4200	Collective Bargaining	3.0	4.0
HRMG 4401	Compensation Management*	4.0	2.5
HRMG 4600	Human Resource Planning*	4.0	2.5
HRMG 4900	Directed Studies (Human Resource Management Applications)	6.0	8.0
OCHS 1433	Introduction to Safety or Human Resources*	4.0	2.5

*denotes a half-term course

Course Descriptions

BLAW 3100 (ADMN 385) Business Law — Presents a one-term, condensed course that 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 3560 (FMGT 307) Finance 1 ADMN — Designed for those with little or no knowledge of financial management to 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 or 2100.

FMGT 4560 (FMGT 404) Finance 2 ADMN — 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 3560.

HRMG 3150 (ADMN 341) Human Resource Management Systems 1 — Introduces 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.

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

HRMG 3200 (ADMN 330) Industrial Relations — Presents 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 — Presents skills development course emphasizing the interpersonal skills necessary for successful selection interviews. Training techniques include role-playing, individual counselling and feedback.

HRMG 3401 Benefits Administration — Benefits planning from a total compensation perspective. A review of various benefit plans including health and insurance, pension, stock/share purchase, RRSPs, paid time off, workers compensation, and contemporary issues such as pension reform, mandatory retirement and employee assistance programming.

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.

HRMG 4150 (ADMN 445) Human Resource Management Systems 2 — Continues from 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 — Introduces the fundamental issues and facts of labour-management relations. Special emphasis is given to collective agreement content and interpretation, bargaining and basic labour economics.

HRMG 4401 (ADMN 447) Compensation Management — Introduces 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 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 from 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.
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BUSINESS

HUMAN RESOURCE MANAGEMENT
Diploma Program

Organizations are composed 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 behaviour 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, teamwork, 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

Applicants apply for the Management Systems program. After completing Level 1 and 2 of the Management Systems program, they then apply for acceptance into the Human Resource Management program which begins with Level 3 (see also Direct-entry to second year).

Students who enter the Human Resource Management program will generally follow the course of studies shown as Levels 1 through 4, with some changes in the offerings and order of courses as the department revises and updates the program to reflect changes in business and industry.

Program Length

Two years, full-time beginning in September each year.

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 extracurricular 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 Management 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 Management 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..

Degree Completion

Continuation of studies to degree completion is recommended for graduates of this diploma.

Program: HUMAN RESOURCE MANAGEMENT

Level 1 (15 weeks)			hrs/wk	credits
BUSA	1100	Management	3.0	3.0
COMM	1100	Business Communication	3.0	3.0
COMP	1104	Introduction to Computing	3.0	3.0
ECON	2100	Microeconomics	3.0	3.0
FMGT	1100	Accounting 1	3.0	3.0
MKTG	1102	Essentials of Marketing	3.0	3.0
OPMT	1110	Business Mathematics	3.0	3.0
Level 2				
BUSA	1600	Decision Support 1	3.0	3.0
BUSA	2140	Entrepreneurial Management		
COMM	2200	Business Communication	3.0	4.0
ECON	2200	Macroeconomics	3.0	4.0
FMGT	2100	Accounting 2	4.0	5.5
OPMT	1130	Business Statistics	4.0	5.5
ORGB	2100	Organizational Behaviour	3.0	4.0
ORGB	2300	Organizational Behaviour 2	3.0	4.0
Level 3				
BLAW	3100	Business Law	4.0	4.0
BUSA	3500	Management Science	3.0	3.0
HRMG	3100	Human Resource Management	4.0	3.0
FMGT	3560	Finance 1	4.0	4.0
HRMG	3150	Human Resource Management Systems 1	3.0	3.0
HRMG	3170	Human Resource Dynamics Workshop	3.0	3.0
HRMG	3200	Industrial Relations	4.0	4.0
HRMG	3400	Compensation Management		

BUSINESS

Level 4		hrs/wk	credits
BUSA 4800	Management Policy	3.0	4.0
FMGT 4560	Finance 2	4.0	6.0
HRMG 3300	Recruitment and Selection*	4.0	2.5
HRMG 3500	Training and Development*	4.0	2.5
HRMG 4150	Human Resource Management Systems 2*	4.0	2.5
HRMG 4200	Collective Bargaining	3.0	4.0
HRMG 4400	Benefits Administration*	4.0	2.5
HRMG 4600	Human Resource Planning*	4.0	2.5
HRMG 4900	Directed Studies	6.0	8.0
OCHS 1433	Introduction to Safety for Human Resources*	4.0	2.5

*denotes a half-term course

Course Descriptions

BLAW 3100 (ADMN 385) Business Law — Presents a one-term, condensed course that 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 — Presents 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) Decision Support 1 — Introduces microcomputers and software. Students become familiar with software programs to be used in other program areas. Prerequisite/Corequisite: COMP 1104.

BUSA 2140 (ADMN 214) Entrepreneurial Management — Investigates 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 4800 (ADMN 410) Management Policy —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 1 — Designed to give students basic listening, writing, and speaking skills that 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 — 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 — Uses lectures and practical exercises to present topics on computer terminology, hardware, software, DOS (Disc Operating System) and a word processing package.

ECON 2100 (ADMN 100) Microeconomics — Covers 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 — Continues from FMGT 1100. Topics include temporary investments and receivables, capital assets, liabilities, bonds, payroll, corporations, partnerships, financial position statements, financial statement analysis and manufacturing accounting. Prerequisite: FMGT 1100.

FMGT 3560 (FMGT 307) Finance 1 Administration — Designed for those with little or no knowledge of financial management to 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 or 2100.

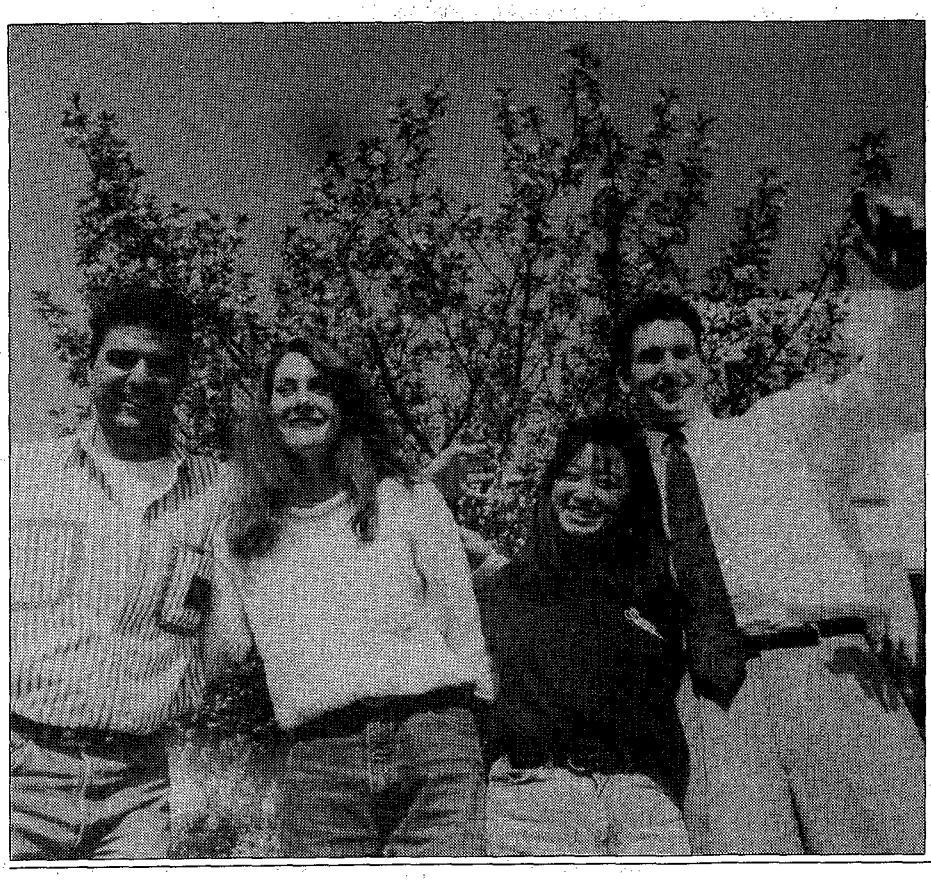
FMGT 4560 (FMGT 404) Finance 2 Administration — Instructs students in raising capital to finance a firm. Topics include capital budgeting; short, medium and long-term financing; leasing; security analysis; the Canadian capital and money markets as they affect business decisions of Canadian firms. Prerequisite: FMGT 3560.

HRMG 3100 (ADMN 340) Human Resource Management — Designed for persons interested in management and/or supervision. It develops an understanding of significant human resource management programs and systems utilized in today's business and government organizations. Employment related legislation and current human resource management issues are surveyed. Topics cover human resource management functions with some emphasis upon practical application of the techniques studied. Prerequisites: BUSA 1100 and ORGB 2100.

HRMG 3150 (ADMN 341) Human Resource Management Systems 1 — Introduces 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 — 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 — Presents 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 — Presents 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 3401 (ADMN 346) Benefits Administration — Introduces 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.

HRMG 4150 (ADMN 445) Human Resource Management Systems 2 — Continues from 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 — Introduces the fundamental issues and facts of labour-management relations. Special emphasis is given to collective agreement content and interpretation, bargaining and basic labour economics.

HRMG 4401 (ADMN 447) Compensation Management — Introduces 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 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.

BUSINESS

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.

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 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 — Reviews 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 preprogrammed calculator, and practical application from the field of financial management.

OPMT 1130 (OPMT 132) Business Statistics — Enables 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 Behaviour — Studies 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.

ORGB 2300 (ADMN 227) Organizational Behaviour 2 — Continues the examination of the human side of the enterprise, concentrating first on the total organization, communication, conflict, power and politics, leadership and organizational culture. Ending with such dynamic factors as planned change, organizational development, stress management, performance appraisal and career planning. Prerequisite: ORGB 2200.

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 Corequisite)
BUSA	2280	MKTG 1102 (or Corequisite)
COMM	2200	COMM 1100
FMGT	2100	FMGT 1100
OPMT	1130	None

Level 3

BUSA	3500	OPMT 1110 & OPMT 1130
HRMG	3100	ORGB 2100
HRMG	3150	ORGB 2100, BUSA 1600
HRMG	3170	ORGB 2100
HRMG	3200	None
BUSA	3600	BUSA 1600
BLAW	3100	None

Level 4

BUSA	4800	All Level 1 through 3 courses or permission from the program head
HRMG	3300	HRMG 3170/HRMG 3150
HRMG	3500	HRMG 3170/HRMG 3150
HRMG	4200	HRMG 3200
HRMG	4400	HRMG 3400
HRMG	4900	All Level 1 through 3 courses or permission from the program head
FMGT	4560	FMGT 3560
OCHS	1433	None

Faculty and Staff

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T.P. Juzkow, B.A.Sc., M.B.A., P.Eng.
R. Kessler, M.A., B.Comm.
F. Mandl, B.Sc., M.B.A.
W. Ratzburg, B.Sc., Dip.Ed., M.B.A.
S. Scott-Hallam, B.Sc., M.B.A.
R.M. Sharp, B.A.Sc., M.B.A., P.Eng.
G. Storey, B.A., M.Sc., C.H.R.P., 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.

Advisory Committee

Doug Alley, B.C. Business Council
Gail Binion, Insurance Corporation of B.C.
Suzanne Bolton, Human Resource Consultant
Laurier Bourassa, P.N.E.
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Wendy March, St. Paul's Hospital
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Sarah Stanger, Pan Pacific Vancouver Hotel
Eileen Stewart, City of Vancouver
Margo Thom, Towers, Perrin, Forster & Crosby
D'Arcy Warner, B.C. Gas

BUSINESS

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 fundamentals of business and their application to international trade. International business depends 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 careers. The International Trade program is ideal for those graduates who would eventually like to establish themselves as entrepreneurs in exporting and importing. Other career opportunities occur in marketing, finance and management with firms such as 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.

Prerequisites
High school graduation with Math 11 and English 12 both with C+ are the minimum course requirements for this program. Applicants must have excellent communication skills and the ability to work well with others. Proof of basic computer literacy, either by providing evidence of having successfully completed a basic introductory computer course, or by demonstrating possession of equivalent competence by completing a challenge exam prior to being accepted. Preference is given 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 the International Trade program. A pre-admission interview may be conducted by members of the Operations Management Technology to assess an applicants' suitability for the field, including written and oral communications skills.

Program: INTERNATIONAL TRADE

Level 1 (15 weeks)

		hrs/wk	credits
BUSA 1100	Management	3.0	3.0
COMM 1100	Business Communication	3.0	3.0
COMP 1104	Introduction to Computing	3.0	3.0
ECON 2100	Microeconomics	3.0	3.0
FMGT 1100	Accounting 1	3.0	3.0
MKTG 1102	Essentials of Marketing	3.0	3.0
OPMT 1110	Business Mathematics	3.0	3.0
TDMT 1101	Geography of Trading	3.0	3.0
TDMT 1150	Distribution 1 (CITT)	4.0	4.0

Level 2 (20 weeks)

BLAW 3410	Business and International Law	4.0	5.5
COMM 2200	Business Communication	3.0	4.0
ECON 2200	Macroeconomics	3.0	4.0
FMGT 2100	Accounting 2	3.0	4.0
MKTG 2243	Sales Skills	3.0	4.0
OPMT 1121	Business Statistics	4.0	5.5
OPMT 1148	Industrial Engineering International/ Transportation	2.0	2.5
OPMT 2209	Computer Applications	2.0	2.5
TDMT 2203	Transportation Economics	3.0	4.0
TDMT 2250	Distribution 2 (CITT)	3.0	4.0

Level 3 (15 weeks)

FMGT 3550	Business Finance	3.0	3.0
MKTG 2309	Marketing Research 1	4.0	4.0
MKTG 3301	Quantitative Methods/Computer Applications in Marketing	4.0	4.0
OPMT 3353	Microcomputer Applications: Database	3.0	3.0
TDMT 2310	Introduction to Political Science	2.0	2.0
TDMT 3204	Integrated Purchasing	3.0	3.0
TDMT 3301	Logistics 1	3.0	3.0
TDMT 3305	International Trade	4.0	4.0
TDMT 3315	Intermodalism	3.0	3.0

Level 4 (20 weeks)

		hrs/wk	credits
FMGT 4550	Management Accounting/ International Finance	3.0	4.0
HRMG 3050	Management Workshop*	5.0	3.5
MKTG 3409	Marketing Research 2	3.0	4.0
MKTG 4401	Marketing Planning	4.0	5.5
OPMT 1446	Quality Assurance* (International)	3.0	2.0
TDMT 1409	Harmonized Systems & NAFTA	3.0	4.0
TDMT 4401	Logistics 2*	4.0	2.5
TDMT 4402	Introduction to Projects*	4.0	2.5
TDMT 4411	Industry Project	17.0	10.0

*denotes a half-term course

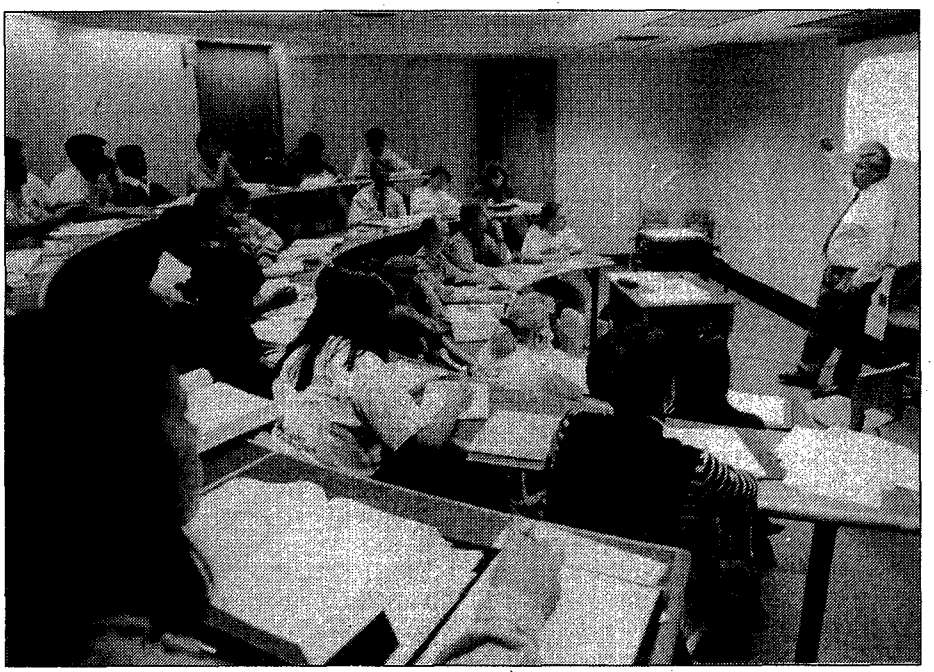
Note: The program is continuously evolving and therefore may not be exactly as shown.

Course Descriptions
BUSA 1100 (ADMN 102) Management — Presents 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 1 — Designed to give students basic listening, writing, and speaking skills that 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 — 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.

BUSINESS



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

ECON 2100 (ADMN 100) Microeconomics — Covers 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 — Includes temporary investments and receivables, capital assets, liabilities, bonds, payroll, corporations, partnerships, financial position statements, financial statement analysis and manufacturing accounting. 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: One of FMGT 2100, 2180 or 2190.

HRMG 3050 (ADMN 347) Management Workshop — Explores day-to-day management issues. Specific topics include organizational behaviour, industrial relations, interviewing skills, job evaluation and the introduction of change.

MKTG 1102 (MKTG 102) Essentials of Marketing — 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. Prerequisite: MKTG 1102.

MKTG 3301 (MKTG 301) Quantitative Methods/Computer Applications in Marketing — Examines 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. Prerequisite: MKTG 3301.

OPMT 1110 (OPMT 110) Business Mathematics — Reviews 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 — Teaches students some of the techniques used by highly productive and competitive companies. 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.

OPMT 1446 (OPMT 446) Quality Assurance (International) — 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 2209 (OPMT 209) Computer Applications 1 — 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 3353 (OPMT 353) Microcomputer Applications Database — Examines 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 — Covers 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. Transportation is the basis of all economic systems including agricultural production, industrial location, settlement patterns, marketing systems and consumer shopping.

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) Introduction to Canada Customs & NAFTA — 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 North American Free Trade Agreement (NAFTA) regulations and Rules of Origin. 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 — Teaches students 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 — Presents 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 — 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 3315 (TDMT 309) Intermodalism — 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 — Prepares students 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 — Provides 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

L. Shapiro, B.Sc., M.Sc., Associate Dean
B. Boleen, B.Comm., CITT
K. Boswell, M.Mus., C.G.A.
C. Chan, M.B.A.
S. Corning, Dipl.T
S.E. Dudra, B.Comm., M.B.A., G.P.I.M., Program Head, Operations Management
F.L. Gruen, B. Mgt. Eng., M.A.Sc.
K.C. Hartley, B.A.Sc., P.Eng., C.P.I.M.
A.S. Lee, B. Eng., P.Eng., M.Ed.
D.W. Malcolm, B.Sc., A.Sc.T.T.
D.J. Mallory, B.A.Sc., M.A., Ph.D., Program Head
J.A.I. Millette, B.A., M.Ed.
G.W. Murray, Dipl.T.
J. Ribic, B.I.E., Program Head, Senior Certificate for Trades
G. Sagar, B.A.Sc., M.B.A.
W.J. Sheriff, B.A., B.Sc.
C.V. Spong, Dipl.T.
S. Turnbull, B.A., B.B.A., Program Head, Transportation Logistics & International Trade
J. Young, B.Sc., M.B.A., P.Eng.
R. Wlock, B.A.Sc., P.Eng.

Advisory Committee

Mike Palmer, Chairperson, Martin-Brower Canada Limited
Eric Anderson, Casco Terminals Limited
Wayne Buchanan, Pacific Coast Shipping Agency Co. Ltd
Frauken Danmeyer, BC Trade Development Corporation
Bruce Dewar, Pareto Trading House Limited
Cliff Edwards, Stilewood International Manufacturing Ltd.
Bill Hammond, Reed Stenhouse Limited
Ross Hodges, Casco Terminals Limited
Paul Judd
Jim Kendall, Summit Customs Brokers
Su Ann Lim, BC Telephone Company
Keven Ouelette, Johnston International Services
Dorothee Schenkel, Magnacargo
Doug Taylor
Elsie Taylor, CN North America

MANAGEMENT SYSTEMS
Diploma Program

The Management Systems curriculum is undergoing revisions intended to increase the integration of course content across the curriculum. The following curriculum is therefore subject to change in the coming year.

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 behaviour, 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.

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BUSINESS

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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.

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 extracurricular 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.

***Note:** The curriculum for this program is under review. Courses listed are subject to change.

Program: MANAGEMENT SYSTEMS

Level 1 (15 weeks)

			hrs/wk	credits
BUSA	1100	Introduction to Business	3.0	3.0
BUSA	1600	Decision Support 1	3.0	3.0
COMM	1100	Business Communication 1	3.0	3.0
ECON	2100	Microeconomics	3.0	3.0
FMGT	1100	Accounting 1	4.0	4.0
MKTG	1102	Essentials of Marketing	4.0	3.0
OPMT	1110	Business Mathematics	4.0	4.0

Level 2 (20 weeks)

BUSA	2240	Applied Management Fundamentals	3.0	4.0
BUSA	2600	Decision Support 2	4.0	5.5
COMM	2200	Business Communication 2	3.0	4.0
ECON	2200	Macroeconomics	3.0	4.0
FMGT	2100	Accounting 2	4.0	5.5
OPMT	1130	Business Statistics	4.0	5.5
ORGB	2200	Organizational Behaviour 1*	3.0	2.0
ORGB	2300	Organizational Behaviour 2*	3.0	2.0

*denotes a half-term course

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.

HRMG 3100 (ADMN 340) is taken by both Options A and B, but in different levels.

The Management Systems Level 3 and 4 (options A & B) are currently under review. Changes in the program may significantly affect the prerequisites, course titles, course descriptions, and other details currently listed. Students registering for this program in September, 1996, should contact the department and/or Student Services to obtain the most recent information.

Option A: MANAGEMENT SYSTEMS

Level 3

			hrs/wk	credits
BLAW	3100	Business Law	4.0	4.0
BUSA	3500	Management Science	3.0	3.0
BUSA	3600	Microcomputer Applications 2 (Data bases)	3.0	3.0
FMGT	3221	Management Accounting	4.0	4.0
FMGT	3560	Finance 1	4.0	4.0
HRMG	3100	Human Resource Management	4.0	3.0
HRMG	3200	Industrial Relations	4.0	4.0
MKTG	2334	Applied Marketing and Selling	3.0	3.0

Level 4

BUSA	4620	Microcomputer Applications*	4.0	2.5
BUSA	4800	Management Policy	3.0	4.0
COMP	3110	Networks & Current Developments	3.0	4.0
FMGT	4560	Finance 2	4.0	6.0
FMGT	4730	Computerized Accounting*	4.0	2.5
HRMG	4900	Directed Studies	6.0	8.0
OPMT	2170	Management Engineering	4.0	5.5
TDMT	1353	International Business*	4.0	2.5

*denotes a half-term course

Option B: MICROCOMPUTERS IN BUSINESS

Level 3 (15 weeks)

BLAW	3100	Business Law	4.0	4.0
BUSA	3500	Management Science	3.0	3.0
BUSA	3600	Microcomputer Applications 2 (Data bases)	3.0	3.0
FMGT	3560	Finance 1	4.0	4.0
FMGT	3221	Management Accounting	4.0	4.0
HRMG	3200	Industrial Relations	4.0	4.0
MKTG	2334	Applied Marketing and Selling	3.0	3.0
OPMT	2173	Management Engineering	4.0	4.0

BUSINESS

Level 4 (20 weeks)		hrs/wk	credits
BUSA 4600	Microcomputer Applications 3	4.0	5.5
BUSA 4800	Management Policy	3.0	4.0
COMP 3110	Networks & Current Developments	3.0	4.0
FMGT 4560	Finance 2	4.0	6.0
FMGT 4730	Computerized Accounting*	3.0	2.5
HRMG 3100	Human Resource Management*	4.0	3.0
HRMG 4900	Directed Studies	6.0	8.0
OPMT 1171	Materials Management*	4.0	2.5
TDMT 1353	International Business*	4.0	2.5

*denotes a half-term course

Course Descriptions

BLAW 3100 (ADMN 385) Business Law — Presents a one-term, condensed course that acquaints 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.

BUSA 1100 Introduction to Business — Designed to establish a base level of knowledge concerning the position of British Columbia businesses in the global economy. Basic concepts of management process and function are expanded to include planning and organizing with integrated support from correlating courses in Microeconomics, and Business Communication. Concepts of teamwork ethics and decision making will be introduced.

BUSA 1600 (ADMN 160) Decision Support 1 — Begins the process of teaching the business student to appreciate the microcomputer as an aid to management and business process design. The course will focus on the basics of business processes and managerial modelling. Material will be drawn from courses across the program in order to set the ground work for development of an end user approach to business computing. Retrieval of internal data and its conversion into information necessary for managerial decision-making will constitute a major portion of the course. Prerequisite: COMP 1104.

BUSA 2250 Business Fundamentals (currently under development) — Builds on the integrated concepts presented in Level 1 of the program, this course begins the process of applying basic concepts to the current business climate. An expanded emphasis on Intrapreneurial/Entrepreneurial Management, Functional Integration with a focus on implementation and decision-making supported by additional microcomputer applications, Microeconomics and Organizational Behaviour courses facilitate the development of a Business Plan at the conclusive stage of this course. Organizational Behaviour courses will enhance the student's understanding of management concepts and applied skills in motivating, job design, group dynamics, leadership, conflict resolution, communication and multi-culturalism.

BUSA 2600 Decision Support 2 — Builds on the BUSA 1600 course by expanding on the managerial approach developed in that course. This course will broaden the concepts of an information system by accessing internal and external sources of data. Using and modifying various management systems to support decision making serves as a foundation for understanding management's role in designing their information systems. Prerequisite: BUSA 1600.

BUSA 3400 Integrated Management Studies — Introduces advanced decision-making through computer modelling, legal/ethical considerations and direct application to a variety of profit and non-profit organizations. Information technology sourcing and application is fine turned and the introduction of the strategy — organization linkage provides the necessary tools to fully assess comprehensive case studies, some of which will be computer simulations.

BUSA 3500 (ADMN 310) Management Science — Introduces 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) — 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 4600 (ADMN 460) Microcomputer Applications 3 — Includes 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 — Includes one or more of the following: Object Oriented Programming; Group Decision Support Systems. 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 software packages may also be explored. Prerequisite: BUSA 3600.

BUSA 4800 (ADMN 410) Management Policy — Analyzes 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 from the program head.

COMM 1100 (BCOM 100) Business Communication 1 — 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 — 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 3110 Networks & Current Developments — Familiarizes the student with the operation of networks, central operating systems and other current developments in the computer field to prepare them for the eventuality that they may become computer support systems personnel in a small to medium company in addition to other duties. Prerequisite: BUSA 3600.

ECON 2100 (ADMN 100) Microeconomics — Focuses on the analysis and operation of the firm in various types of market conditions and covers 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 — Continues from 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 levels changes. Prerequisite: FMGT 1100.

FMGT 3221 (FMGT 304) Management Accounting Administration — Covers 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: One of FMGT 2100, 2180 or 2190.

FMGT 3560 (FMGT 307) Finance 1 Administration — Allows those with little or no knowledge of financial management to 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 or 2100 .

FMGT 4560 (FMGT 404) Finance 2 Administration — Instructs students in raising capital to finance a firm. Topics include capital budgeting; short, medium and long-term financing,; leaving; security analysis; the Canadian capital and money markets as they affect business decisions of Canadian firms. Prerequisite: FMGT 3560.

FMGT 4730 (FMGT 418) Computerized Accounting Administration — Presents a specialist subject required by Level 4 students in Administrative Management. This subject will explore the installation and use of sophisticated accounting software and a range of 'add-ons' which together form a Decision Support System. Software chosen for this subject may vary from year to year but will always include at the centre a high-level FIS and at least three highly functional 'add-ons.' Prerequisite: One of FMGT 2100, 2180 or 2190.

HRMG 3100 (ADMN 340) Human Resource Management — Introduces 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. Prerequisites: BUSA 1100 and ORGB 2100.

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

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 from the program head.

MKTG 1102 (MKTG 102) Essentials of Marketing — 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 — Focuses 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 — Reviews 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 preprogrammed calculator, and practical applications from the field of Financial Management.

OPMT 1130 (OPMT 130) Business Statistics — Enables 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 — Covers 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.

OPMT 2170 Management Engineering — 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 operation. 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 — Presents 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 examinations, 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 2200 (ADMN 226) Organizational Behaviour 1 — Introduces the human side of the enterprise. Studies human behaviour in an organizational setting. Concentrating initially on individual factors: personality, the psychological contract, attitudes, perception, job satisfaction, motivation, punishment, reinforcement, learning and job design. Finishing with an examination of group and inter-group behaviour: group effectiveness and design, team building and group dynamics, group decision-making, norms and cohesiveness, with an emphasis on the management of a diverse, multicultural workforce.

ORGB 2300 (ADMN 227) Organizational Behaviour 2 — Presents a continuing examination of the human side of the enterprise, concentrating first on the total organization, communication, conflict, power and politics, leadership and organizational culture. Ending with such dynamic factors as planned change, organizational development, stress management, performance appraisal and career planning.

TDMT 1353 International Business — Allows students to develop an understanding of the international operating environment. The course will scan the current global trading environment and provide the students with a set of base skills required by international firms. Prerequisite: Successful completion of third level.

Faculty and Staff

M. Baxter, B.B.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.,
C.L.R. Jaques, B.A., M.A.
L. Jones, B.Sc., M.Sc.
T.P. Juzkow, B.A.Sc., M.B.A., P.Eng.
R. Kessler, M.A., B.Comm.
F. Mandl, B.Sc., M.B.A.
D. Pepper, B.A., M.Sc., Ph.D., Program Head
W. Ratzburg, B.Sc., Dip.Ed., M.B.A.
S. Scott-Hallam, B.Sc., M.B.A.
R.M. Sharp, B.A.Sc., M.B.A., P.Eng.
G. Storey, B.A., M.Sc.
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.

Advisory Committee

Jack Arnold, Chambers Phillips & Co.
Ron Einblau, Ron Einblau & Associates
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, tourism firms and services.

Job Opportunities

Marketing Communications graduates are employed in business communications positions, and within 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.

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 other businesses, such as industrial buyers, and retailers, or merchandise buyers.

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.

Expenses

Students in some programs, e.g.: 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. 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 resume and a letter explaining your reason for taking the program. 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 (SE6) on Burnaby campus with signs posted at entrances advising of the room designated. Scheduled dates and times for Spring 1996 are as follows:

Saturday, February 17:	1000-1200
Friday, March 8:	1900-2100
Saturday, April 13:	1000-1200
Friday, May 10:	1900-2100

BUSINESS

Technology: MARKETING

Level 1 (All students, 15 weeks)

		hrs/wk	credits
BUSA 1100	Management	3.0	3.0
COMM 1100	Business Communication	3.0	3.0
COMP 1104	Introduction to Computing	3.0	3.0
ECON 2100	Microeconomics	3.0	3.0
FMGT 1100	Accounting 1	4.0	4.0
MKTG 1102	Essentials of Marketing	4.0	3.0
OPMT 1110	Business Mathematics	4.0	4.0

Level 2 (all students, 20 weeks)

COMM 2200	Business Communication	3.0	4.0
COMP 2104	Microcomputer Applications*	3.0	2.0
ECON 2200	Macroeconomics	3.0	4.0
FMGT 2100	Accounting 2	4.0	5.5
MKTG 2202	Introduction to Marketing Communications	3.0	4.0
MKTG 2243	Sales Skills	3.0	4.0
OPMT 1130	Business Statistics	4.0	5.5
ORGB 2100	Organizational Behaviour*	3.0	2.0
TOUR 1260	Issues in Tourism (Tourism Program only)	3.0	4.0

Program: MARKETING COMMUNICATION

Note: Program curriculum is under review and subject to change.

Level 3 (15 weeks)

BLAW 3100	Business Law	4.0	4.0
FMGT 3222	Management Accounting Marketing	4.0	4.0
MKTG 2309	Marketing Research 1	4.0	4.0
MKTG 3301	Computer Applications in Marketing	4.0	4.0
MKTG 3317	Sales Promotion Management	3.0	3.0
MKTG 3339	Public Relations Management	3.0	3.0
MKTG 3417	Design Production	4.0	4.0

Level 4 (20 weeks)

		hrs/wk	credits
MKTG 3409	Marketing Research 2*	3.0	2.0
MKTG 4318	Media Planning*	6.0	4.0
MKTG 4401	Marketing Planning	4.0	5.5
MKTG 4415	Promotion Strategy and Planning*	6.0	4.0
MKTG 4416	Advertising Internship*	18.0	12.0
MKTG 4419	Direct Marketing Dynamics*	3.0	2.0

Program: REAL ESTATE STUDIES

Level 3 (15 weeks)

MKTG 2309	Marketing Research 1	4.0	4.0
MKTG 3311	Real Estate Principles 1	4.0	4.0
MKTG 3312	Economics of Real Estate Markets	4.0	4.0
MKTG 3313	Introduction to Real Estate Finance	4.0	4.0
MKTG 3333	Real Estate Marketing and Management	4.0	4.0
MKGT 3334	Advanced Sales and Negotiating	4.0	4.0

Level 4 (20 weeks)

BLAW 3500	Law for Real Estate Marketing	4.0	5.5
MKTG 3409	Marketing Research 2*	3.0	2.0
MKTG 4330	Real Estate Practice	2.0	2.5
MKTG 4411	Real Estate Management 2	4.0	5.5
MKTG 4412	Introduction to Real Estate Appraisal and Investment Analysis	4.0	5.5
MKTG 4413	Mortgage Finance	4.0	5.5
MKTG 4414	Introduction to ICI Sales and Management*	4.0	2.5
MKTG 4418	Directed Studies	4.0	5.5

Program: TOURISM MANAGEMENT

Level 3 (15 weeks)

		hrs/wk	credits
FMGT 3222	Management Accounting Marketing	4.0	4.0
MKTG 2309	Marketing Research 1	4.0	4.0
MKTG 3306	Principles of Small Business Management	4.0	4.0
TOUR 2303	Conventions, Meetings and Incentive Travel	3.0	3.0
TOUR 2305	Special Events, Trade Shows and Exhibitions	3.0	3.0
TOUR 2325	Tourism Product Development	4.0	4.0
TOUR 2344	Planning for Tourism Markets	3.0	3.0
TOUR 2900	Regional Tourism Field Study (Practicum)	1.0	1.0

Level 4 (20 weeks)

BLAW 3100	Business Law	4.0	4.0
HRMG 3100	Human Resource Management*	4.0	3.0
MKTG 3409	Marketing Research 2*	3.0	2.0
MKTG 4407	Case Studies — Entrepreneurship*	4.0	2.5
TOUR 2301	Group Travel, Charters and Tours	3.0	3.0
TOUR 3411	Passenger Transportation Marketing	3.0	4.0
TOUR 3444	International Markets and Cultures	4.0	5.5
TOUR 4400	Development of Community Tourism	4.0	5.5
TOUR 4418	Directed Studies	4.0	5.5

*denotes a half-term course

BUSINESS

Program: PROFESSIONAL SALES

Level 3 (15 weeks)

		hrs/wk	credits
FMGT 3222	Management Accounting Marketing	4.0	4.0
MKTG 2309	Marketing Research 1	4.0	4.0
MKTG 3301	Computer Applications in Marketing	4.0	4.0
MKTG 3302	Business Marketing	4.0	4.0
MKTG 3334	Advanced Sales and Negotiating	4.0	4.0
MKTG 3343	Sales Management	4.0	4.0

Level 4 (20 weeks)

BLAW 3100	Business Law	4.0	4.0
MKTG 3305	International Marketing	2.0	5.5
MKTG 3338	New Product Development	2.0	2.5
MKTG 3409	Marketing Research 2	3.0	4.0
MKTG 4401	Marketing Planning	2.0	5.5
MKTG 4402	Relationship Selling*	4.0	2.5
MKTG 4403	Industry Sales Practicum*	4.0	2.5
MKTG 4418	Directed Studies	4.0	5.5
MKTG 4419	Direct Marketing Dynamics*	3.0	2.0
MKTG 4430	Retail Distribution Strategies*	3.0	2.0

Program: SMALL BUSINESS DEVELOPMENT

Level 3 (15 weeks)

		hrs/wk	credits
FMGT 3222	Managerial Accounting Marketing	4.0	4.0
MKTG 2309	Marketing Research 1	4.0	4.0
MKTG 3301	Computer Applications in Marketing	4.0	4.0
MKTG 3302	Business Marketing	4.0	4.0
MKTG 3306	Principles of Small Business Management	4.0	4.0
MKTG 3334	Advanced Sales and Negotiating	4.0	4.0
MKTG 3343	Sales Management	4.0	4.0
MKTG 3338	New Product Development*	4.0	2.5

Level 4 (20 weeks)

		hrs/wk	credits
BLAW 3100	Business Law	4.0	4.0
MKTG 3305	International Marketing	4.0	5.5
MKTG 3409	Marketing Research 2*	3.0	2.0
MKTG 4401	Marketing Planning	4.0	5.5
MKTG 4407	Case Studies/ Entrepreneurship*	4.0	2.5
MKTG 4408	Business Planning Practicum*	4.0	2.5
MKTG 4418	Directed Studies	4.0	5.5
MKTG 4430	Retail Distribution Strategies*	3.0	2.0
MKTG 4419	Direct Marketing Dynamics*	3.0	2.0

*denotes a half-term course

Course Descriptions

BLAW 3100 (ADMN 385) Business Law — 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 — Presents a one-term course that 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. Prerequisite: Successful completion of all Level 2 courses.

BUSA 1100 (ADMN 102) Management — Presents 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 1 — Designed to give students basic listening, writing, and speaking skills that 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 — 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 — Uses lectures and practical exercises to present topics on computer terminology, hardware, software, DOS (Disc Operating System) and a word processing package.

COMP 2104 (COMP 210) Microcomputer Applications — Introduces microcomputer applications using a database and spreadsheet package, the IBM mainframe and electronic mail. Prerequisite: COMP 1104.

ECON 2100 (ADMN 100) Microeconomics — Covers 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 — Continues from FMGT 1100. Topics include temporary investments and receivables, capital assets, liabilities, bonds, payroll, corporations, partnerships, financial position statement, financial statement analysis and manufacturing accounting. Prerequisite: FMGT 1100.

FMGT 3222 (FMGT 303) Management Accounting (MKTG) — Presents a specialist subject for Marketing Management students in the Professional Sales, Advertising and Tourism programs. Spreadsheets are used to develop a series of templates to handle financial statement analysis, product costing, budgets, performance reports and capital asset planning. Control of decentralized operations and variable costing are also covered. Prerequisite: One of FMGT 2100, 2180 or 2190.

HRMG 3100 (ADMN 340) Human Resource Management — Introduces 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 and BUSA 1100.

MKTG 1102 (MKTG 102) Essentials of Marketing — 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 — Designed to cover the mechanics of salesmanship and the salesperson's role in the firm. Prerequisite: MKTG 1102.

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) Computer Applications in Marketing — Examines 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 Marketing — Examines 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 — Examines 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.

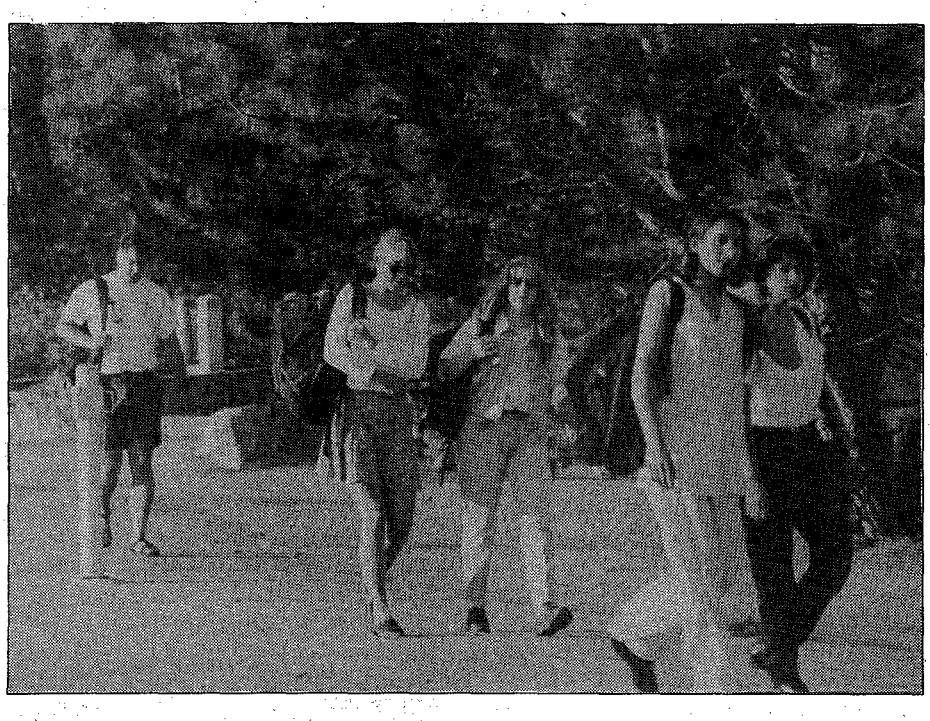
MKTG 3306 (MKTG 306) Principles of Small Business Management — Examines the planning stages involved in starting a new business including market, financial and legal feasibility requirements. Prerequisite: Successful completion of all Level 2 courses.

MKTG 3311 (MKTG 311) Real Estate Principles 1 — Includes law, estates and interests in land. 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 course, combined with MKTG 4411 will prepare the students to successfully challenge the Real Estate Salesperson's examinations, administered by UBC. 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 — Presents a study of all promotional support activities such as trade shows, publicity, special events, direct response marketing and promotional specialities. 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 3334 Advanced Sales & Negotiating — Builds on the basic selling skills acquired previously and develops analytical, negotiating and conflict resolution skills that are required in complex selling situations. All aspects of professional, ethical conduct leading to successful seller/client contractual relationships are addressed through lecture and role playing activities. Studies will be exposed to the use of industry standard tools and techniques.

MKTG 3338 (MKTG 338) New Product Development — Presents 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 — Presents 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 — Covers 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 — Presents 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 — Emphasizes 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 and MKTG 3218.

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) Relationships Selling — Covers professional selling skills utilizing buyer behaviour, 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) Industry Sales Practicum — Provides 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 — Analyses 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 — Allows a graduate to challenge the Real Estate Salesman's and Sub-mortgage Brokers pre-licensing exam. Prerequisite: Successful completion of all Level 3 courses. Prerequisite: MKTG 3311.

MKTG 4412 (MKTG 412) Introduction to Real Estate Appraisal and Investment Analysis — Designed for use by salespersons, 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 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 value, elements of land economics, feasibility studies including investment analysis and the various indices used to measure a "return" on investment societies. Prerequisite: MKTG 3312.

MKTG 4413 (MKTG 413) Mortgage Finance — Enables 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 3313.

MKTG 4414 Introduction to IC&I Sales and Property Management — Focuses on the unique characteristics of the Industrial, Commercial and Investment segments of the real estate industry. Through lectures, guest speakers, field trips and practical case studies the student will be better prepared to enter the IC&I or property management fields. Prerequisite: Successful completion of all Level 3 courses.

MKTG 4415 (MKTG 415) Promotion Strategy and Planning — Presents 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 — Provides students with 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 — Provides students with one day a week 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 4419 Direct Marketing Dynamics — Focuses on how to use technological tools to build a one-on-one marketing relationship with a client base. The differences between mass marketing and one-on-one marketing are examined and applied to each step of the market analysis and relationships planning process.

MKTG 4430 (MKTG 430) Retail Distribution Strategies — Presents 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 — Reviews 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 — Emphasizes 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 Behaviour — Presents 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 — Covers the development, research and marketing of tour packages and charters, resulting in a variety of employable skills. 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 (DMCs) 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 — 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 — Demonstrates how 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 skill 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 — Presents 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 — Requires 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 infield 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 — Covers competitive factors and regulatory changes that 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 — Designed to develop a knowledge base about world tourism markets beyond the North American (Canada & USA) geographical/cultural sphere. The focus is 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 — Provides a foundation course in the Tourism program examining 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.

BUSINESS

TOUR 4418 (TOUR 418) Directed Studies — Provides students with one day a week 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.
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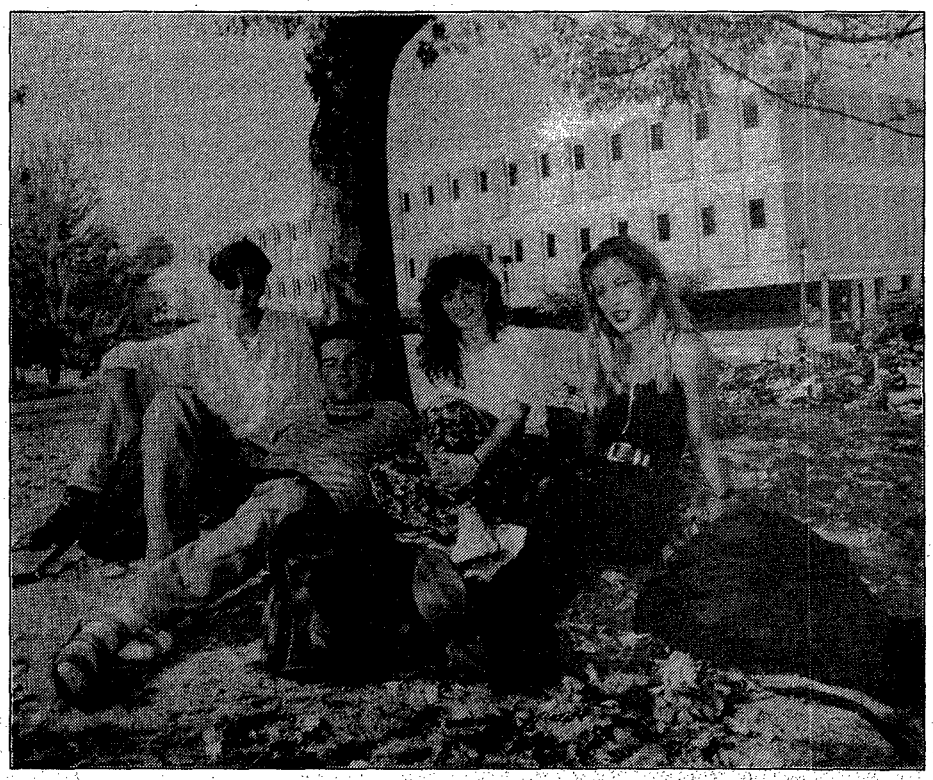
M.I. Shacker, B.B.A.G.
D. Smith, B.A., M.B.A.
G. Urbshadt, B.Comm., Program Head, Technical Sales/Marketing
R.A. Venne, B.Comm., (Hons. Econ.), M.B.A.
C.D. Westcott, B.Sc., R.I. (B.C.), Program Head, Real Estate Studies
T. Winder, B.A., M.B.A., M.F.A. (Advertising)

Advisory Committee: Marketing Communications

David Stanger, BBDO
Terry Dinsmore, BBM Bureau of Measurement
Ted Griffith, Robinson Griffith & Company
Joff Grohne, Karo Design Resources
Sharon Parker, MacDonald Dettwiler
Linda Bartz, Vancouver Hospital
Cheryl Johnson, Events West
Glen Chilton, Go Direct Marketing
Steve Brook, BBDO
Carroll Nelson
Della Smith, Quay Strategies
John Taylor, Benwell Atkins Ltd.
Neil Howard, BCIT Marketing & Development
Carole Wilson, Carole Wilson & Associates



Advisory Committee: Real Estate Studies

Michael Baker, Matra Construction Inc.
Aaron Dohm, Colliers, Macaulay Nicolls
Larry Ferster, Royal LePage Real Estate Services Ltd.
Derek Innes, National Real Estate Service
Mike Klasen, Colliers, Macaulay Nicolls
Bob Laurie, Finning Limited
Eileen Lewis, Metropolitan Life
Gary Nakagawa, Cumberland Consulting Corp.
Graham McIntosh, Real Estate Division, UBC
Bill Phillips, Royal LePage Real Estate Services Limited
Bob Rennie, Rennie & Associates Realty
Al Saunders, Edgecombe Properties Ltd.
Merrily Hackett, Sutton Group — Elite Realty
Bryan Woolley, Vigers Realty Ltd.

Advisory Committee: Technical Sales and Marketing

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Carol Borghesi, BC Tel
Noulan Bowker
David St. Laurent, Media Group West
Ross Erikson, Emerson Radio Canada Ltd.
David Somerset, Dairyworld
Paul Guiton, Paul Guiton & Assoc.
Glen Adams, Scott National
Susan O'Connor
Vera Piccini, Rogers Cable

Advisory Committee: Tourism Management

Frank Addison, Addison Travel Marketing
Jean Anderson, Chair, B.C. Chamber of Commerce
Mark Andrew, Hyatt Regency Hotel
Malcolm Ashford, Pacific Rim Institute of Tourism (Ex Officio)
Murray Atherton, Great Canadian Railtour Company
Geoff Bird, Tourism & Hospitality Programs, Ministry of Advanced Education, Training & Technology (Ex Officio)
Julia Blockberger, Julia Blockberger Ltd.
Glyn Edwards, Destination Planners Inc.
Sheldon Eggen, Charter Bus Lines Inc.
Phil Heard, Molson Indy Vancouver
Stuart Henderson, Sage Resource Group
Sue Henderson, G.F. (Sue) Henderson & Associates
Michael Horsey, Northwest Arena Corporation
Peter Kutney, Air B.C.
Richard Lemon, Tourism Products & Services, Ministry of Tourism (Ex Officio)
Ray Lord, Science World
Fiona Marshall-White, Foster Marshall White Productions Inc.
Ron Stanaitis, Vancouver Board of Trade
Norman Stowe, The Pace Communications Group
Paul Vallee, Tourism Vancouver
John Williams, Empress 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 in minimizing response times, reducing inventory, and improving 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.

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.

Program: OPERATIONS MANAGEMENT

Level 1 (15 weeks)			hrs/wk	credits
BUSA	1100	Management	3.0	3.0
CHSC	1122	Properties of Materials	4.0	3.0
COMM	1100	Business Communication	3.0	3.0
COMP	1104	Introduction to Computing	3.0	3.0
ECON	2100	Microeconomics	3.0	3.0
FMGT	1100	Accounting 1	4.0	4.0
MECH	1800	Interpretation of Technical Drawings	2.0	2.0
OPMT	1108	Applied Mathematics for Business/Industry	4.0	4.0
OPMT	1137	Industrial Engineering 1	6.0	6.0

Level 2 (20 weeks)				
COMM	2200	Business Communication	3.0	4.0
ECON	2200	Macroeconomics	3.0	4.0
FMGT	2100	Accounting 2	4.0	5.5
OPMT	1207	Manufacturing Processes	3.0	4.0
OPMT	1208	Applied Statistics for Business/ Industry	4.0	5.5
OPMT	1258	Production and Inventory Management 1*	3.0	2.0
OPMT	2209	Computer Applications	2.0	2.5
OPMT	2237	Industrial Engineering 2	4.0	5.5
OPMT	2261	Information Systems 1	3.0	4.0
PHYS	1022	Applied Physics for Operations Management	4.0	4.5

BUSINESS

Level 3 (15 weeks)		hrs/wk	credits
CDCM 1800	CAD for Operations Management	2.0	2.0
FMGT 3224	Cost Accounting: Operations Management	4.0	4.0
OPMT 2341	Quality Management	3.0	3.0
OPMT 2358	Production and Inventory Management 2	3.0	3.0
OPMT 3308	Quantitative Methods 1	4.0	4.0
OPMT 3337	Industrial Engineering 3	4.0	4.0
OPMT 3340	Industrial Automation	3.0	3.0
OPMT 3361	Information Systems 2	4.0	4.0
ORGB 2110	Organizational Behaviour	3.0	3.0

Level 4 (20 weeks)			
HRMG 3090	Supervising Human Resources*	3.0	2.0
HRMG 3200	Industrial Relations	4.0	4.0
MKTG 1115	Fundamentals of Marketing*	3.0	2.0
OCHS 1441	Introduction to Safety for Operations Management*	3.0	2.0
OPMT 2405	Purchasing*	3.0	2.0
OPMT 3458	Production and Inventory Management 3*	5.0	3.5
OPMT 4408	Quantitative Methods 2*	4.0	2.5
OPMT 4437	Industrial Engineering 4*	9.0	6.0
OPMT 4438	Entrepreneurial Business Plan Development	3.0	2.0
OPMT 4449	Industry Project*	18.0	12.0
OPMT 4461	Information Systems 3*	3.0	2.0

*denotes a half-term course

Course Descriptions

BUSA 1100 (ADMN 102) Management — Presents 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.

CDCM 1800 (CDCM 323) CAD for Operations Management — Covers rudiments of computer-aided drafting. Machine log-on procedures. Simple 2D 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 1 — Designed to give students basic listening, writing, and speaking skills that 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 — 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 — Uses lectures and practical exercises to present topics on computer terminology, hardware, software, DOS (Disc Operating System) and a word processing package.

ECON 2100 (ADMN 100) Microeconomics — Covers 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. 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 — Continues from FMGT 1100. Topics include temporary investments and receivables, capital assets, liabilities, bonds, payroll, corporations, partnerships, financial position statements, financial statement analysis and manufacturing accounting. Prerequisite: FMGT 1100.

FMGT 3224 (FMGT 306) Cost Accounting (OPMT) — Concentrates specifically on cost accounting for operations management. Topics include basic cost concepts, systems of cost accumulation, accounting for manufacturing overhead with emphasis on activity based accounting, standard cost systems and the analysis of cost variances. Variable costing is also dealt with. Cash and capital budgeting are discussed in detail. Prerequisite: One of FMGT 2100, 2180 or 2190.

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.

HRMG 3200 (ADMN 330) Industrial Relations — Presents 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 Engineering 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 — Provides an overview of the marketing concept.

OCHS 1441 (OH&S 441) Introduction to Safety for Operations Management — Introduces 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 — 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 — 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, and 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 — 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.

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 — Begins a three-course series 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 — Begins with a brief review of the introductory Windows and Excel concepts presented in COMP 1104. Then, the student will be introduced to more advanced Excel commands and applications (larger and more professional worksheets, built-in functions, graphics, database, macros, transferring data to word processing documents). Prerequisite: COMP 1104.

OPMT 2237 (OPMT 237) Industrial Engineering 2 — Presents a second-level problem-solving course that 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 — Introduces 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: COMP 1104.

OPMT 2341 (OPMT 341) Quality Management — Covers 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; and Canadian national standards for quality program. Prerequisite: OPMT 1208.

OPMT 2358 (OPMT 358) Production and Inventory Management 2 — Continues from 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 — 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 1 for Management — Designed to increase quantitative problem-solving skills. It will focus on the use of models, some of which are fairly standard and others that 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, 2237, 2253 and COMP 1104.

OPMT 3337 (OPMT 337) Industrial Engineering 3 — 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 or 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 — Introduces 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 — Concludes the three-course series 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 2341, 2358.

OPMT 4408 (OPMT 408) Quantitative Methods 2 — Continues from OPMT 3308. Prerequisite: OPMT 3308.

OPMT 4437 (OPMT 437) Industrial Engineering 4 — Integrates the industrial engineering activities of Business Planning, Project Management and the Implementation of Change. This course will provide the student with the basic techniques to assess, plan and implement change in order to improve the effectiveness and performance of an organization. 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. Prerequisites: OPMT 4437, MKTG 1115 and FMGT 3224.

OPMT 4449 Industry Project — Presents the capstone course. A major industry project will be conducted three days per week. The student must demonstrate the application of Operations Management principles and techniques to solve an industry problem. Prerequisite: All Level 3 courses and 4A courses.

OPMT 4461 (OPMT 461) Information Systems 3 — Covers 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 Behaviour — Studies human behaviour 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 behaviour 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 — Deals with the basic concepts in physics which relate to industrial techniques and processes. Conceptual understanding is emphasized while problem solving is used to reinforce ideas. Topics include kinematics, dynamics, energy and thermodynamics, electricity and magnetism, wave motion and optics.

Faculty and Staff

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B. Boleen, B.Comm., CITT
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R. Wlock, B.A.Sc., P.Eng.

Advisory Committee

Nancy Clark, Langley Memorial Hospital
Mats Gerschman, Glenayre Electronics
Brian Holmes, Columbia Plastic Ltd.
Hilary Holyk, Pirelli Cables Incorporated
Bruce Marsh, Coopers & Lybrand Consulting Group
Iain McLean, Ballard Power Systems Inc.
Graham Parkes, Discovery Innovation Centre
Pat Schooley, Beaver Lumber
Jim Rae, BTE
Jerry Silver, Oracle Corporation
Merv Stanley, BC Tel
Glen Thorne, Weatherhaven Resources Ltd.

BUSINESS

OPERATIONS MANAGEMENT SENIOR CERTIFICATE FOR TRADESPERSONS

Certificate Program

Please Note: This program is currently undergoing a curriculum review. Program content is therefore subject to change. Contact Program Head Joe Ribic at (604) 451-6745 for current information.

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 management and teamwork skills.

Program Summary

Students develop and enhance their personal managerial capabilities by critically examining the concepts of continuous improvement as applied to the process/ project, purchasing, quality, materials, personal and information functions of an organization. This examination is enhanced with communication, analytical problem solving techniques, 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
- Municipal Building Inspector

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 to complete 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.

Program: CERTIFICATE FOR TRADESPERSONS

Level 1 September-December (15 weeks)

		hrs/wk	credits
BUSA 1100	Management	3.0	3.0
COMM 1101	Communications 1 for Senior Technicians	4.0	4.0
COMP 1104	Introduction to Computing	3.0	3.0
FMGT 1151	Accounting Essentials for Small Business	4.0	4.0
OPMT 1109	Industrial Practicum 1	4.0	0.5
OPMT 1110	Business Mathematics	4.0	4.0
OPMT 1146	Industrial Engineering 1	4.0	4.0
OPMT 1147	Production/ Inventory Management 1	4.0	4.0

Level 2A January-March (10 weeks)

		hrs/wk	credits
COMM 2201	Communication 2 Senior Technicians	3.0	3.5
MKTG 1114	Basic Marketing Principles	3.0	2.0
OPMT 1202	Introduction to Quantitative Methods	2.0	5.5
OPMT 1220	Industrial Practicum 2	5.0	3.5
HRMG 2000	Supervisory Skills (Trades)	3.0	2.0
OPMT 2246	Industrial Engineering 2	4.0	5.5
OPMT 2247	Production/ Inventory Management 2	4.0	5.5
OPMT 2253	Microcomputer Applications	4.0	4.5

Level 2B March-May (10 weeks)

BUSA 2200	Entrepreneurial Management	3.0	2.0
COMM 2201	Communication 2 for Senior Technicians	3.0	3.5
HRMG 2010	Industrial Relations (Basics)	3.0	2.0
OCHS 1441	Industrial Health & Safety	3.0	2.0
OPMT 1202	Introduction to Quantitative Methods	4.0	5.5
OPMT 1230	Industrial Practicum 3	4.0	2.5
OPMT 2246	Industrial Engineering 2	4.0	5.5
OPMT 2247	Production/ Inventory Management 2	4.0	5.5
OPMT 2253	Microcomputer Applications	4.0	4.5

Note: Program curriculum under review and subject to change. See program head for current prerequisite structure.

BUSINESS

Course Descriptions

BUSA 1100 (ADMN 102) Management — Presents 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 2200 (ADMN 214) Entrepreneurial Management — Investigates 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: MKTG 1141, FMGT 1151.

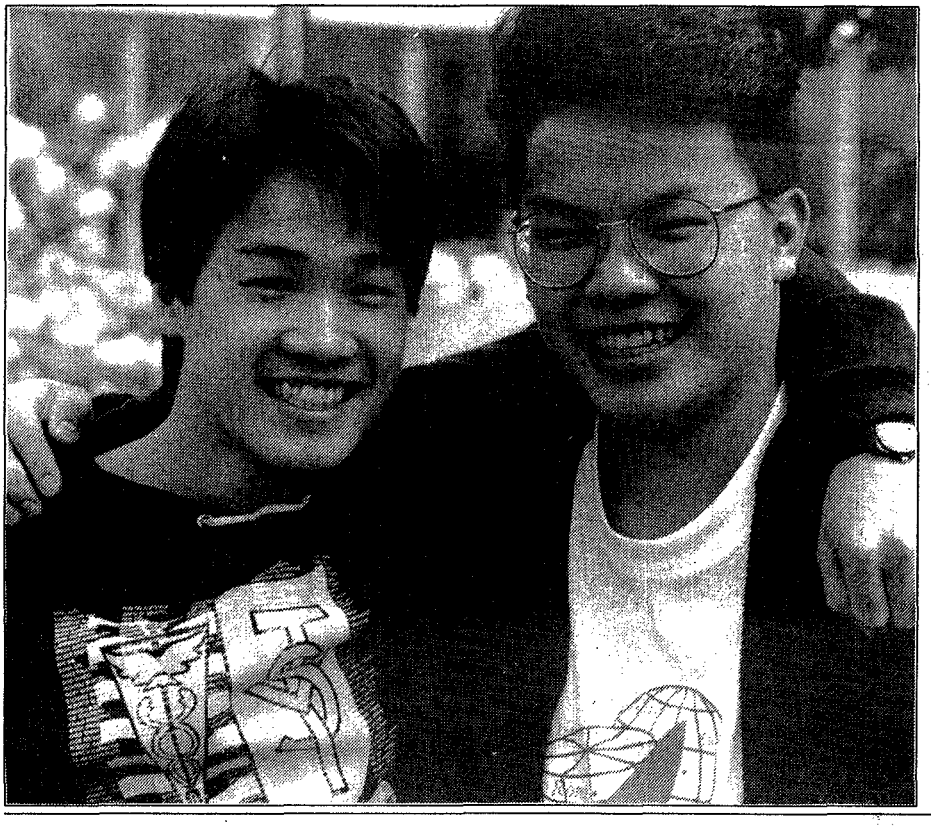
COMM 1101 (COMM 100) Communication 1 Senior Technicians — TBA.

COMM 2201 (COMM 200) Communication 2 Senior Technicians — Prerequisite: COMM 1101.

COMP 1104 (COMP 108) Introduction to Computing — Uses lectures and practical exercises 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 2000 Supervisory Skills (Trades) — Studies management functions such as planning, staffing and structuring the organization, decision making, coordinating activities, delegating tasks, and controlling outcomes. The course examines factors influencing performance, personality, culture, and organizational norms as well as leadership, motivation, group/team development, communications, counselling, discipline, conflict, conflict resolution, and performance appraisal. These topics are studied in order to determine their relationship to the operation of effective work teams or organizations.



HRMG 2010 (ADMN 232) Industrial Relations (Basics) — Presents 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 — 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.

OCHS 1146 (OPMT 146) Industrial Engineering 1 — Presents a six-step systematic approach to methods improvement. The student will learn specific industrial engineering techniques.

OPMT 1109 Industrial Practicum 1 — Allows student to begin, maintain and expand a personal career network. Students are also required to secure a career mentor, complete an assignment of corporate site visitations, join and maintain membership in at least three prescribed professional organizations.

OPMT 1110 (OPMT 110) Business Mathematics — Reviews 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 1147 (OPMT 147) Production/ Inventory Management 1 — Emphasizes practical material that 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) Industrial Practicum 2 —Presents a course similar to OPMT 1109, in as much as content, however, it is considered separate because it is meant to expand upon the previously secured network base.

OPMT 1230 (OPMT 230) Industrial Practicum 3 — Allows students to select and define with an external corporate manager, an opportunity for productivity improvement. Within the bounds of a management/student agreed to terms of reference, the students will demonstrate their abilities and learned skills to successfully conclude an industrial practicum.

OPMT 1441 (OPMT 441) Industrial Health and Safety — Introduces 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 — Continues from 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 — Deals with spreadsheet and database software as applied in an industrial setting. Prerequisite: COMP 1104, OPMT 1110, FMGT 1151.

Faculty and Staff

L. Shapiro, B.Sc., M.Sc., Associate Dean
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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.

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 computer and keyboard skills due to the extensive use of computers in the program.

BUSINESS

Program: TRANSPORTATION LOGISTICS

Level 1 (15 weeks)		hrs/wk	credits
BUSA 1100	Management	3.0	3.0
COMM 1100	Business Communication	3.0	3.0
COMP 1104	Introduction to Computing	3.0	3.0
ECON 2100	Microeconomics	3.0	3.0
FMGT 1100	Accounting Basics 1	4.0	4.0
MKTG 1102	Essentials of Marketing	4.0	3.0
OPMT 1110	Business Mathematics	4.0	4.0
TDMT 1101	Geography of Trading	3.0	3.0
TDMT 1150	Distribution 1 (CITT)	4.0	4.0

Level 2 (20 weeks)			
BLAW 3410	Business and International Law	4.0	5.5
COMM 2200	Business Communication	3.0	4.0
ECON 2200	Macroeconomics	3.0	4.0
FMGT 2100	Accounting 2	4.0	5.5
MKTG 2243	Sales Skills	3.0	4.0
OPMT 1121	Business Statistics	4.0	5.5
OPMT 1148	Industrial Engineering	2.0	2.5
OPMT 2209	Computer Applications	2.0	2.5
TDMT 2203	Transportation Economics	3.0	4.0
TDMT 2250	Distribution 11 (CITT)	3.0	4.0

Level 3 (15 weeks)			
FMGT 3550	Business Finance	3.0	3.0
MKTG 2309	Marketing Research 1	4.0	4.0
OPMT 3301	Quantitative Methods/Computer Applications	4.0	4.0
OPMT 3353	Microcomputer Applications: Database	3.0	3.0
TDMT 3204	Integrated Purchasing	3.0	3.0
TDMT 3301	Logistics 1	3.0	3.0
TDMT 3305	International Trading	4.0	4.0
TDMT 3315	Intermodalism	3.0	3.0

Level 4 (20 weeks)		hrs/wk	credits
FMGT 4550	Management Accounting/ International Finance	3.0	4.0
HRMG 3050	Management Workshop	5.0	3.5
OPMT 1403	Warehousing	5.0	3.5
OPMT 1445	Quality Assurance Services	3.0	2.0
TDMT 1409	Harmonized Systems & NAFTA	3.0	4.0
TDMT 2403	Quantitative Methods	4.0	2.5
TDMT 4306	Transportation Marketing	3.0	4.0
TDMT 4401	Logistics 2	4.0	2.5
TDMT 4402	Introduction to Projects	4.0	2.5
TDMT 4411	Industry Project	17.0	10.0

Note: The program is continuously evolving and therefore is subject to change.

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 — Presents 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 1 — Designed to give students basic listening, writing, and speaking skills that 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 — 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 — Uses lectures and practical exercises to present topics on computer terminology, hardware, software, DOS (Disc Operating System) and a word processing package.

ECON 2100 (ADMN 100) Microeconomics — Covers 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 recordkeeping procedures; the accounting cycle; special journals; cash; merchandising operations; inventory estimation and costing.

FMGT 2100 (FMGT 201) Accounting 2 — Continues from FMGT 1100. Topics include temporary investments and receivables, capital assets, liabilities, bonds, payroll, corporations, partnerships, financial position statement, financial statement analysis and manufacturing accounting. Prerequisite: FMGT 1100.

FMGT 3550/4550 (FMGT 342/442) Business 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 1100, 2100.

HRMG 3050 (ADMN 347) Management Workshop — Explores the day-to-day management issues. Specific topics include organizational behaviour, industrial relations, interviewing skills, job evaluation and the introduction of change.

MKTG 1102 (MKTG 102) Essentials of Marketing — 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 — Designed to cover the mechanics of salesmanship and the salespersons' role in the firm. Prerequisite: MKTG 1102.

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 — Reviews 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 — Teaches students some of the techniques used by highly productive and competitive companies. 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.

OPMT 2209 (OPMT 209) Computer Applications 1 — 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 1403 (OPMT 403) Warehousing — 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 — 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 — Introduces 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. Prerequisite: OPMT 1121 and 2253.

OPMT 3353 (OPMT 350) Microcomputer Applications: Database — Examines 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; and fundamentals of structured programming. Prerequisite: OPMT 2209.

TDMT 1101 (TDMT 101) Geography of Trading — Covers, 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) Introduction to Canada Customs/NAFTA — 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 North American Free Trade Agreement (NAFTA) regulations and Rules of Origin.

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; and 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 1 and 2 — Presents 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 Trade — 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 3315 (TDMT 309) Intermodalism — Familiarizes 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 4306 (TDMT 306) Transportation Marketing — Teaches students 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 — Prepares students 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 — Provides 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

L. Shapiro, B.Sc., M.Sc., Associate Dean
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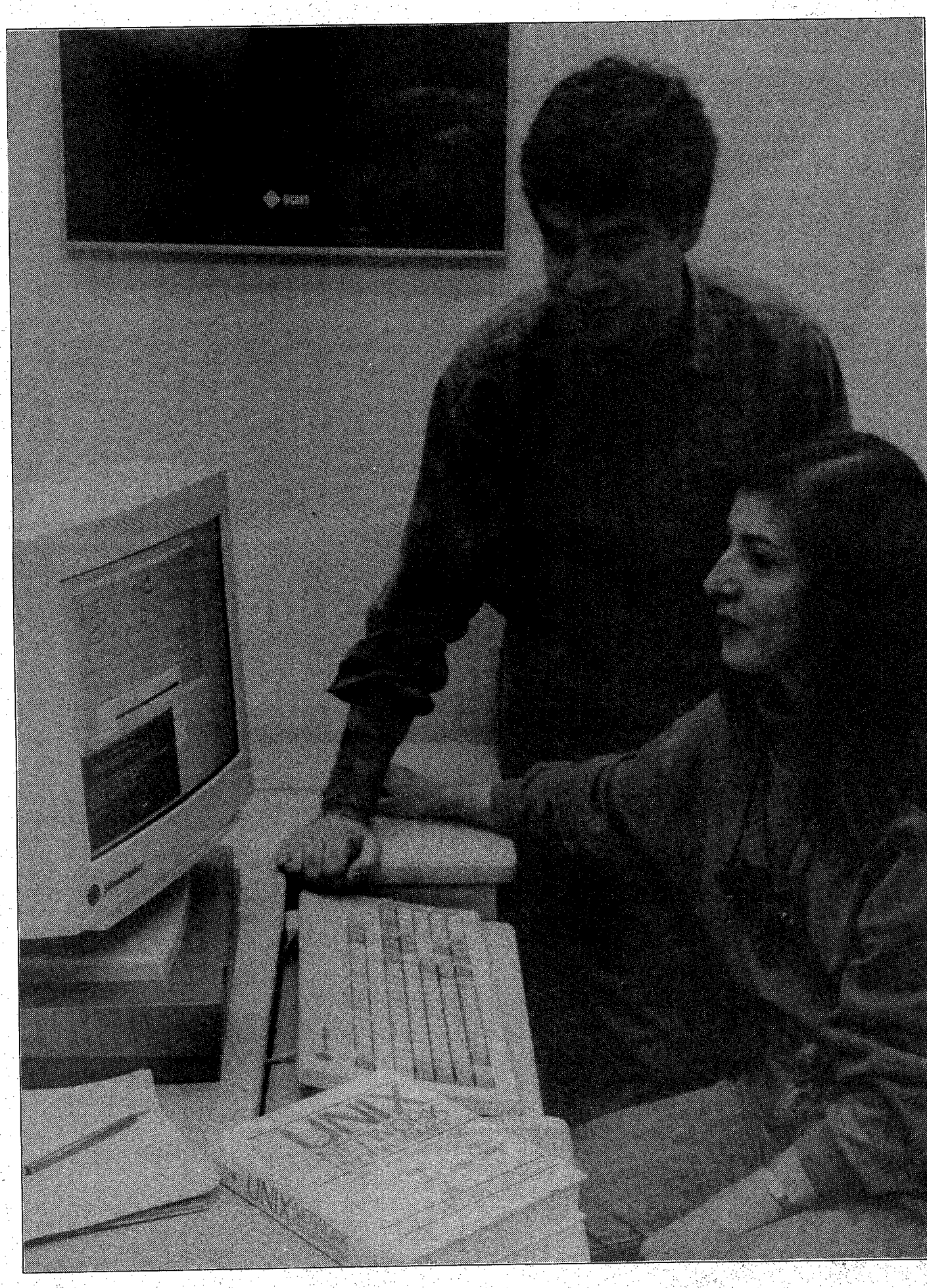
R. Wlock, B.A.Sc., P.Eng.

Advisory Committee

Mike Palmer, Chairperson, Martin-Brower Canada Limited
Eric Anderson, Casco Terminals Limited
Wayne Buchanan, Pacific Coast Shipping Agency Co. Ltd
Frauken Danmeyer, BC Trade Development Corporation
Bruce Dewar, Pareto Trading House Limited
Cliff Edwards, Stilewood International Manufacturing Ltd.
Bill Hammond, Reed Stenhouse Limited
Ross Hodges, Casco Terminals Limited
Jim Kendall, Summit Customs Brokers
Su Ann Lim, BC Telephone Company
Keven Ouelette, Johnston International Services
Dorothee Schenkel, Magnacargo
Doug Taylor
Elsie Taylor, CN North America



COMPUTING AND ACADEMIC STUDIES

SCHOOL OF COMPUTING AND ACADEMIC STUDIES

COMPUTING AND ACADEMIC STUDIES

GENERAL DESCRIPTION

The School of Computing and Academic Studies consists of the Computer Systems Technology and the Academic Studies Division. The primary industry mandate for the School is to meet the needs of the rapidly growing information technology sector. To this end, it offers a wide spectrum of training, including two-year diploma programs, Advanced Diplomas, Bachelor of Technology degrees, and an extensive part-time studies operation. The other major function of the School, through its Academic Studies Division, is to provide program-related courses in Chemistry, Communication, Mathematics and Physics, which are essential to technological education. The School also offers academic upgrading courses and the Engineering Technology Entry Program to prepare the students for two-year diploma programs at BCIT.

ADMINISTRATION

Office of the Dean

Ken Takagaki, B.A.(Hons.), C.M.A., C.D.P., Ph.D., Dean
Kent Yakel, B.Sc.(Hons.), M.Sc., Associate Dean
Suzanne Geddes, B.A., B.Sc., Administrative Officer
Lynne Garneau, Assistant

Computer Systems Technology

Ken Takagaki, B.A.(Hons.), C.M.A., C.D.P., Ph.D., Dean

Academic Studies Division

Kent Yakel, B.Sc.(Hons.), M.Sc., Associate Dean
Pam Curtis, Secretary

For Information Sessions held throughout the year, contact Student Services at (604) 434-3304.

COMPUTER SYSTEMS TECHNOLOGY

Diploma Program

The knowledge and skills required to plan, design and build complex hardware, software and networked computer systems are highly valued in all industry sectors including business, science, health, education and the arts. The Diploma program in Computer Systems Technology provides the foundations for a range of rewarding careers into the rapidly expanding world of Information Technology.

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, games, forecasting and simulation, database management, engineering, decision support and data 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; the use of software packages including word processors, spreadsheets and databases; systems analysis and design. The general business courses include accounting, mathematics, statistics and communication.

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 number of available seats, students are placed using a weighted average of first-year marks.

COMPUTING AND ACADEMIC STUDIES

Second-year Options

Applied Artificial Intelligence Option (AAI): Specializes in applications of knowledge, such as the knowledge of human experts. Knowledge, unlike data or information, is soft and includes components such as judgment and common sense which are challenging to capture on a computer. Students build systems using Knowledge Engineering tools and techniques such as Common LISP, CLOS, PROLOG, shells, virtual reality interfaces, genetic algorithms and neural networks.

Combined Program Option (CP): This program allows the student to choose from a selection of specialized option courses in Applied AI, Microcomputer Systems, Data Communications, Database, Information Systems or Decision Systems.

This program will be of particular interest to students desiring a broader training base than that offered in the Option programs. The program also allows students to pursue individual interests within the context of the Diploma Program. Since students are expected to succeed in courses from several specialty areas, candidates to this program must achieve good academic performance in first year.

Database Option (DBase): This option specializes in design, implementation, management and administration of modern database systems. Topics include Data Modelling, Relational Database theory and practice, distributed databases and client-server models. Intensive practical experience with industry-standard DBMS is offered.

Data Communications Systems Option (DComm): Offers specialized courses in the rapidly expanding Data Communications and Computer Networking field. Students design and develop software for the implementation of Communication protocols, on MS-DOS windows and UNIX platforms, file transfer and LAN applications. Topics include implementation issues, modularity and efficiency for protocol implementation. Students develop client-server models for network applications in the UNIX environment. Students are given a working knowledge of the UNIX TCP/IP and UUCP protocol suites. Computer simulation and modelling techniques are used to analyze the throughput performance of networks.

Decision Systems Option (Decision): Specializes in scientific systems and computer modelling to assist in decision making; emphasizes object-oriented systems/ programming (C++) and Windows/Motif programming. Topics include UNIX, Windows 95, computer simulation, linear/ dynamic programming, Geographic Information Systems (GIS), and Graphical User Interface (GUI) programming.

Information Systems Option (Info): 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 Option (Micro): 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.

Prerequisites

Candidates are evaluated on an individual basis We encourage applications from all interested persons. 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 Management Association (D.P.M.A.).

Advanced Diploma/Bachelor of Technology

The School of Computing also offers a unique, practitioner-oriented Advanced Diploma Program (ADP) in Software Development and a Bachelor of Technology (BTech) program in Computer Systems. In contrast to the two-year Computer Systems Technology (CST) program (which is designed primarily for job entry into the computing industry), the ADP/BTech programs are advanced programs for professional development and further specialization.

The Bachelor of Technology (BTech) in Computer Systems is a practitioner-oriented degree program available to graduates of the ADP in Software Development. It is a Career Enhancement program, designed to increase the breadth of experience for technologists, to help them expand career opportunities and to award the graduates a credential which the marketplace will consider equivalent to (or beyond) a traditional university degree. In addition to the ADP requirements, candidates for the BTech must fulfill requirements in liberal education and complete a thesis (or graduating project).

The ADP/BTech programs are offered in a flexible delivery format to serve the needs of working professionals. Most ADP/BTech courses are offered in the evening or on weekends. Some are offered in the day time (depending on demand).

Applications for the ADP/BTech programs are accepted throughout the year. However, admission is highly selective and competitive. Candidates meet with the Program Head for entry interviews and to have their proposed programs of study (and any changes thereof) approved by the Program Head.

The ADP/BTech programs are under continual review to reflect changes in industry. For the most up-to-date information, please contact:

ADP/BTech Programs in Computer Systems
School of Computing & Academic Studies
British Columbia Institute of Technology
at Tel: (604) 432-8459 or
Fax: (604) 432-9572

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.

Part-time Studies Computer Systems Technology offers an extensive range of courses and programs through Part-time Studies. For further information please refer to the Part-time Studies Calendar or contact Rick Long at (604) 432-8470.

Program: COMPUTER SYSTEMS TECHNOLOGY

Level 1		hrs/wk	credits	option
COMM 1114	Business Communication 1 for Computer Systems	3.0	3.0	
COMP 1100	Enhanced Learning Skills 1	1.0	1.0	
COMP 1510	Programming Methods	6.0	6.0	
COMP 1515	Introduction to C Programming	3.0	3.0	
COMP 1710	Computer Applications Fundamentals	6.0	6.0	
ECON 1150	Economic Issues	3.0	3.0	
FMGT 1100	Accounting 1	4.0	4.0	
OPMT 1113	Applied Mathematics	4.0	4.0	

Level 2

COMM 2214	Business Communication 2 for Computer Systems	4.0	5.5	
COMP 1440	(A) COBOL Programming Language 1	4.0	3.0	
COMP 2100	Enhanced Learning Skills 2	0.5	1.0	
COMP 2510	Introduction to C/C++ Programming	4.0	5.5	
COMP 2710	Systems Analysis and Design	5.0	6.5	
COMP 2720	Computer Organization/Architecture	4.0	5.5	
FMGT 2100	Accounting 2	4.0	5.5	
MKTG 1102	(B) Essentials of Marketing	4.0	3.0	
OPMT 1133	Statistics in Industry	4.0	5.5	

Some courses will run for a half term, designated as (A) or (B). Term (A) extends from January to mid March, and Term (B) extends from mid March to the end of May.

Level 3 Common courses

COMP 2750	Introduction to Decisions Systems	3.0	3.0	
COMP 3510	Applications Programming C /PC Assembler	6.0	6.0	
COMP 3710	Relational Database Systems	4.0	4.0	
COMP 3720	Introduction to Data Communications	3.0	3.0	
COMP 3900	Computer Projects Practicum 1	5.0	5.0	
*Students take **one** of the following courses, depending upon Option.*				
ELEX 2865	Introduction to PC Hardware	4.0	4.0	AAI, Decision, Micro, DComm, some CP
ORGB 2110	Organizational Behaviour	3.0	3.0	Info, Dbase, some CP
*Students take **one** of the following courses, depending upon Option. Combined Program students select **one** course from the list.*				
COMP 3910	Information Technology Management	5.0	5.0	Info
COMP 3920	Database Systems 1	5.0	5.0	Dbase
COMP 3930	Decision Systems 1	5.0	5.0	Decision
COMP 3940	Client Server Computing 1	5.0	5.0	
COMP 3950	Micro Systems & Applications 1	5.0	5.0	Micro
COMP 3970	Applied Artificial Intelligence 1	5.0	5.0	AAI
COMP 3980	Data Communications/Networks 1	5.0	5.0	DComm

Level 4 Common courses

BLAW 3600	Computers and the Law	3.0	4.0	
COMP 3730	(A) Operating Systems Concepts	5.0	3.5	
COMP 4550	(A) Advanced Programming Topics: OOPL	6.0	4.0	
COMP 4710	(B) Software Engineering/CASE	4.0	2.5	
COMP 4730	(B) Topics in Operating Systems	5.0	3.5	
COMP 4900	Computer Projects Practicum 2	5.0	6.5	

COMPUTING AND ACADEMIC STUDIES

	hrs/wk	credits	option
*Students take **one** of the following courses, depending upon Option.*			
COMP 4530 (B) AS/400 Principles of Operation	4.0	2.5	Info
COMP 4560 (B) Advanced Programming Topics	6.0	4.0	AAI, CP, DComm, Dbase Decision, Micro

*Students take **two** of the following courses, depending upon Option. Combined Program students select **two** courses from the list.*

Applied Artificial Intelligence Option			
COMP 4971 Applied Artificial Intelligence 2	4.0	5.5	
COMP 4975 PROLOG and Logic Programming	4.0	5.5	
Combined Program Option (select two)			
COMP 3960 Multimedia	4.0	5.5	
COMP 4915 Special Topics in MIS	4.0	5.5	
COMP 4925 Special Topics in Database	4.0	5.5	
COMP 4935 (A) Geographical Information Systems (GIS)	4.0	2.5 }	count as
COMP 4936 (B) Graphical User Interface Programming (GUI)	4.0	2.5 }	one course
COMP 4940 Client Server Computing 2	4.0	5.5	
COMP 4955 Special Topics in Micro Systems & Applications	4.0	5.5	
COMP 4975 PROLOG and Logic Programming	4.0	5.5	
COMP 4985 Special Topics in Data Communications/Networks	4.0	5.5	
Database Option			
COMP 4921 Database Systems 2	4.0	5.5	
COMP 4925 Special Topics in Database	4.0	5.5	
Data Communications Option			
COMP 4981 Data Communications/Networks 2	4.0	5.5	
COMP 4985 Special Topics in Data Communications/Networks	4.0	5.5	
Decision Systems Option			
COMP 4931 Decision Systems 2	4.0	5.5	
COMP 4935 (A) Geographical Information Systems (GIS)	4.0	2.5 }	count as
COMP 4936 (B) Graphical User Interface Programming (GUI)	4.0	2.5 }	one course
Information Systems Option			
COMP 4911 Selected MIS Topics	4.0	5.5	
COMP 4915 Special Topics in MIS	4.0	5.5	
Microcomputer Systems Option			
COMP 4951 Micro Systems & Applications 2	4.0	5.5	
COMP 4955 Special Topics in Micro Systems & Applications	4.0	5.5	

Some courses will run for a half term, designated as (A) or (B). Term (A) extends from January to mid March, and Term (B) extends from mid March to the end of May.

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.

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 1 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 2 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 writing 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 1100 (COMP 152) Enhanced Learning Skills 1— 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 1440 COBOL Programming Language 1 —Presents business computer programming using the popular "high-level" COBOL language. The student learns to apply the basic principles and practices of business computer programming and to write simple programs in COBOL. Topics include programming methods, structured programming, documentation standards, flowcharting, report design, sequence checks, page overflow and control breaks. Students will write, compile and run COBOL programs on an IBM computer. Prerequisite: COMP 1510.

COMPUTING AND ACADEMIC STUDIES

COMP 1510 (COMP 154) Programming Methods — Complements COMP 1710 and is a prelude to all future systems and programming courses. The course presents modern principles of programming methodologies. Students write programs that are readable, reusable, and easy to maintain.

COMP 1515 Introduction to C Programming —Presents a core subset of the C language, including selected data types, input/output, logic control, and algorithm development. Many examples are presented, with small assignments directly built upon the examples. The follow-on course (COMP 2510) fills out portions of C programming purposely omitted from this introduction.

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 2100 Enhanced Learning Skills 2 — Continues from COMP 1100, Enhanced Learning Skills. Students continue to practice skills learned in the first course. Career planning and current industry issues are emphasized. (Course proposed at printing time.)

COMP 2510 (COMP 257) Introduction to C/C++ Programming — Continues from COMP 1510 and COMP 1515 - assumes students are already familiar with general programming issues, have experience designing programs, and have a basic understanding of the C programming language. The course covers advanced data types and control structures, pointers, the C/C++ preprocessor, and file I/O. In addition, the students are introduced to C++ as a "better C" and learn how to use C++ to create abstract data types. Students will develop several small text processing and data management programs and then work in a group to construct one larger program. Prerequisites: COMP 1510, 1515, 1710.

COMP 2710 (COMP 270) Systems Analysis and Design — Continues the material covered in COMP 1710. Areas include systems development life cycle, starting a 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. Prerequisites: FMGT 1100, COMM 1114, COMP 1510, 1515, 1710, OPMT 1113.

COMP 2720 (COMP 252) Computer Organization/Architecture — Organization and operation of the functional units in modern computers. Evolution of computer architecture and current microprocessor designs. Discussion and comparison of several modern machines. Sequential and combinational circuit design. Memory technologies and bus structures. Internal data representation and architectural issues affecting programming. Instruction set design and an introduction to operating systems. Prerequisites: COMP 1510, 1515, 1710, OPMT 113.

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 behavioural aspects of implementation of computer models. Prerequisite: OPMT 1133.

COMP 3510 (COMP 356) Applications Programming C/PC Assembler — Continues from COMP 2510 and 2720 — assumes familiarity and experience with the C language and familiarity with microcomputer architecture. The course begins with an intensive study of microcomputer assembly language, including interfacing of assembly language to high-level languages. Those portions of the standard C function library not mentioned in COMP 2510 are covered. Algorithms for data and file organization are described and implemented. User interface and low-level microcomputer issues are also explored. Several significant projects, including one group project, are completed. Prerequisites: COMP 2510, 2720.

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: One of COMP 2615, 2710 or 3620.

COMP 3720 (COMP 471) Introduction to Data Communications — Introduces modern computer communications and networking using layered protocols. Synchronous and asynchronous data transmission. Character and bit-oriented protocols. Circuit switched and packet switched networks. Issues in Internetworking. Analysis of networks. Issues in Network design, routing, flow and congestion control. Digital Modulation schemes. Error detection/correction algorithms. Prerequisites: COMP 2720, OPMT 1113 and 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. Prerequisites: COMP 2510, 2720.

COMP 3900 (COMP 392) Computer Projects Practicum 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. Prerequisites: COMM 2214, COMP 2510, 2710, 2720.

COMP 3910 (COMP 353) Information Technology Management — Develops a framework that identifies the significant topics or issues that are common to most MIS organizations. Within this structure students will explore the roles and responsibilities of specific MIS groups, develop an understanding of the role of key technology infrastructures, learn how to acquire and manage IT assets as a resource, and identify outstanding issues that remain to be addressed if MIS units are to remain relevant. Prerequisite: Completion of first year or permission from the instructor.

COMP 3920 Database Systems 1 — Extends from COMP 3710 and designed for students who have a special interest in database technology. Topics include the importance of data in an organization; conceptual, logical and physical data modelling; meta data and data repository; steps of transforming user requirements to a database; database implementation; performance tuning and optimization; backup and recovery; roles and responsibilities of Data and Database Administrators in an organization. Prerequisite: Completion of first year or permission from the instructor. Corequisite: COMP 3710.

COMP 3930 (COMP 380) Decision Systems 1 — Covers UNIX commands, utilities, scripts, C/C++ compilers and multi-process programming. Introduces object-oriented systems/programming techniques and visual analysis approaches to standard management science problems (e.g. computer simulation). Prerequisite: Completion of first year or permission from the instructor.

COMP 3940 Client-Server Computing 1 — Covers most of the analysis and design techniques used to implement a Client Server application. Topics include definition of Client Server Architecture, differences from traditional application environment, data model, event model, process decomposition, data flow diagram, windowing environment and GUI prototype, database design, client and server delineation, architecture model and implementation planning including software distributing strategy. Students will be exposed to a Client Server environment using SQL Server, TCP/IP and PowerBuilder. Prerequisite: COMP 2710.

COMP 3950 (COMP 351) Microcomputer Systems and Applications 1 — Combines two mini-courses in a single course. The first mini-course is on Network Administration: Students learn how to set up and maintain a Novell network. The second mini-course (which accounts for 80% of the time) covers software development for Microsoft Windows (using the C programming language and the Windows Application Programmer Interface). Prerequisite: COMP 2720 and COMP 2510.

COMP 3960 Multimedia — Introduces the student to issues in programming in a multimedia environment. Topics include graphic design principles, animation, authoring, programming and production. Prerequisite: Completion of first year or permission from the instructor.

COMP 3970 (COMP 357) Applied Artificial Intelligence 1 — Students learn the Common LISP language and its CLOS object-oriented extension. This course prepares students to use these development tools in related courses (COMP 3900, 4900, and 4975) by exploring several AI application paradigms. Prerequisite: Completion of first year or permission from the instructor.

COMP 3980 (COMP 386) Data Communications/Networks 1 — Introduces LAN installation and administration using NOVELL Netware. Basic serial data communications programming, using BIOS services and Interrupt Service Routines. DOS and WINDOWS systems programming. Interfacing to Communications hardware. Implementation of bit and character-oriented protocols for DOS and WINDOWS platforms. Introduction to UNIX system programming. Prerequisite: Completion of first year or permission from the instructor.

COMP 4530 (COMP 456) AS/400 Principles of Operation — Gives an overview of principles of AS/400 operation. Discusses OS/400, AS/400 tools and utilities and design alternatives. Programming includes DDS/400, CL/400, DFU and QUERY/400. Prerequisites: COMP 3710, 3730.

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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 OOPLs such as Smalltalk, Actor, C++ and object-oriented extensions to popular microcomputer-based languages such as Pascal and C. Prerequisite: COMP 3510 or 3520.

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. Prerequisites: COMP 3510, 3730.

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) Topics in Operating Systems — 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 or permission from the instructor (as topics may change, consult program head).

COMP 4900 (COMP 492) Computer Projects Practicum 2 —See COMP 3900. Prerequisites: COMM 2214, COMP 2510, 2710, 2720.

COMP 4911 (COMP 453) Selected Topics in MIS — Builds on the framework developed in COMP 3910. At the beginning of the term, the instructor and students will develop a list of topics they would like to pursue and then embark on in-depth discussion of key technological issues (e.g., data compression, data encryption, the Internet, data security, disaster recovery planning, DSS/EIS/GSS/Expert Systems, hierarchical storage management, automated software distribution). Students will be expected to complete 4-5 research-type assignments as well as a term presentation. Prerequisite: COMP 3910.

COMP 4915 Special Topics in MIS — Splits material covered into two ten week segments. The first (*Hands-on UNIX*) provides an introduction to UNIX, including an examination of its role within a client/server environment as well as its strong networking capabilities (including a look at its support for Internet access). Experience programming the Bourne Unix shell and using X-windows will be provided. The second segment (*Visual Basic / Microsoft Office Integration*) offers an opportunity to become proficient in a powerful object-oriented, event-driven development environment (Visual Basic) and to develop integrated applications that combine the functionality of existing MS Office products (Word for Windows, Excel, PowerPoint, Access) with Visual Basic code through the use of DDE, OLE2, and ODBC constructs. Prerequisites: COMP 3510, 3710.

COMP 4921 Database Systems 2 — Divides topics covered into four major areas: history of database software development, current trends, information resource management (IRM) and organizational issues. Details of this course will change from year to year depending on the maturity of the technology and the interests of the students. Students are expected to be able to select a DBMS for an organization after completing this course. Prerequisite: COMP 3920.

COMP 4925 Special Topics in Database — Emphasizes application development in a data sharing environment. Topics covered include methodology and design techniques; different approaches of database model (hierarchical, network and relational) and their implications to application design; Computer Aided Software Engineering (CASE) tools and application generators; embedded database calls and Application Program Interface (API). Students participate in various roles of a project team and design and implement a database application. Prerequisite: COMP 3710.

COMP 4931 (COMP 481) Decision Systems 2 —Covers Graphical User Interface (GUI) design/programming for IBM PC compatibles using the Borland C++ compiler. Topics include event handling, menu/dialogue window creation, resource management, dynamic linked libraries (DLLs). Students will also learn a little Visual Basic. Students will develop advanced decision support systems within Windows' container applications. Covers object linking/embedding (OLE) so that students can access/process data created from other Windows' server applications (Excel, etc.). Covers structured storage, compound files, compound documents and automation. Prerequisite: COMP 3930.

COMP 4935 Geographic Information Systems (GIS) — Introduces the operational aspects of GIS software using ARC/INFO in a UNIX workstation environment. Topics include data entry, editing, map design, tabular geographic analysis, and the ARC macro language (AML). Prerequisite: Completion of first year or permission from the instructor.

COMP 4936 Graphical User Interface Programming (GUI) — Introduces GUI programming for UNIX graphical workstations (Silicon Graphics Incorporated INDYs) using the AT&T C++ compiler. Covers event handling, window creation/destruction and resource management for the X Windows and Motif windowing systems. Prerequisite: Completion of first year or permission from the instructor.

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COMP 4940 Client-Server Computing 2 —Divides material covered into 5 major areas: Understanding Client Server Computing; the Client; the Server; the Network; and Development and Deployment. Topics include overview and evolution of Client Server Computing; Client hardware, software, and requirements; Server hardware, environment and requirements; Network layers, interfaces and protocol; LAN hardware and Network Operating Systems; development methodology; application development tools; production environment. Upon completion of the course, the students will have a good understanding of the components within a Client Server environment. Prerequisite: COMP 3940.

COMP 4951 (COMP 451) Micro Systems and Applications 2 — Covers software development for OS/2. All aspects of the OS/2 Kernel (base operating system — e.g., multi-tasking, inter-process communications), the Presentation Manager (PM) and the Graphics Programming Interface (GPI) are covered. COMP 3950 is a prerequisite for this course since many of the programming features of PM are similar to or are extensions to Windows. Interactive graphic and client-server applications are discussed and implemented. Prerequisite: COMP 3950.

COMP 4955 Special Topics in Micro Systems and Applications — Combines two mini-courses in a single course (each of which run for half of the term). The first half-term mini-course is on advanced DOS development, covering technical issues not addressed by previous courses (e.g. memory resident programs and device drivers). The second half-term mini-course is on network programming, specifically focusing on NETBIOS and client-server applications. Prerequisite: Completion of first year or permission from the instructor.

COMP 4971 (COMP 457) Applied Artificial Intelligence 2 — Explores a variety of Knowledge Engineering tools and techniques, such as inference engines (deductive, inductive, and abductive); machine learning strategies; natural language interfacing; virtual world-building; neural networks; cellular automata, and genetic algorithms. Throughout the course, emphasis is on using these elements in building useful real-world applications. Typically, students practice and demonstrate these in their COMP 4900 project course. Prerequisite: COMP 3970.

COMP 4975 (COMP 457) PROLOG and Logic Programming — Covers the PROLOG language and its underlying formal logic principles. A major focus is the task of describing real-world objects and processes in natural language (English), then transforming such descriptions into more formal descriptions (predicate calculus or PROLOG). This process, called declarative programming, is very different from the procedural programming many students are used to. Prerequisite: Completion of first year or permission from the instructor.

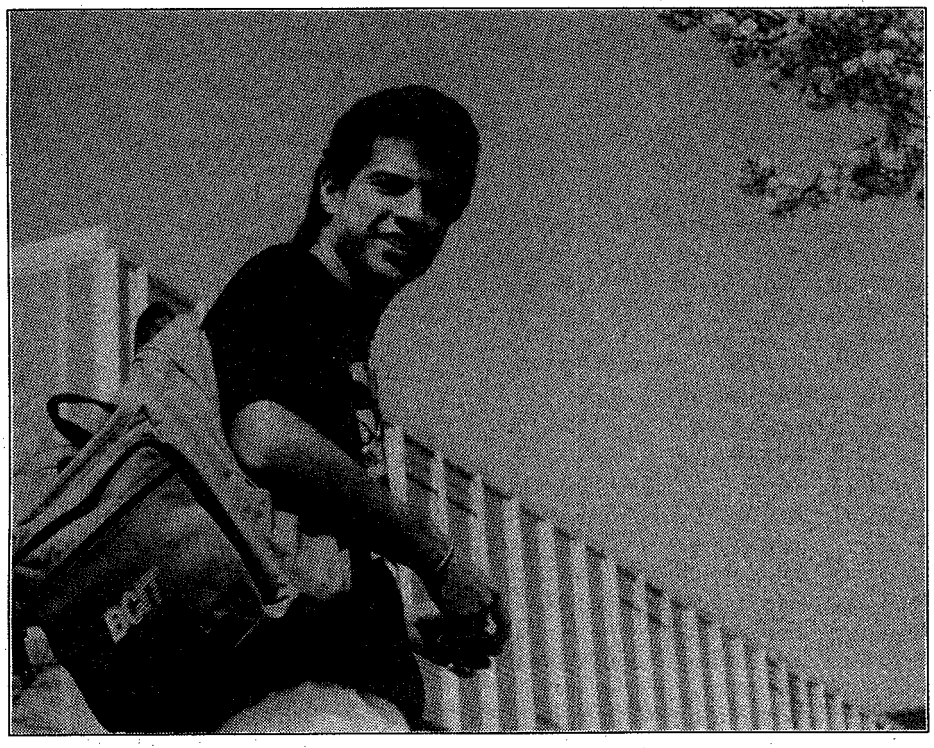
COMP 4981 Data Comm/Networks 2 — Covers advanced topics in Data Communications; UNIX system programming for communications; Implementation of UNIX TCP/IP and UUCP networks. Students develop client-server models for network applications in the UNIX environment. Internetworking programming issues. Prerequisite: COMP 3980.

COMP 4985 Special Topics in Data Comm/Networks — Covers advanced topics in Data Communications/Network design and throughput performance analysis using simulation and modelling techniques. Covers Internetworking programming issues. Design and development of LAN applications using the NOVELL IPX, SPX and NETBIOS services. Issues include network security and encryption. Implementation of error detection/correction algorithms. Prerequisite: COMP 3720.

ECON 1150 (ADMN 101) Economic Issues — Investigates provocative and timely economic issues which may involve discussions of immigration and education policy, government deficit and debt, free trade, environmental concerns and interest rate/exchange rate analysis. Will foster dialogue to heighten awareness and appreciation of the Canadian business environment.

ELEX 2865 (ELEC 261) Introduction to IBM/PC Hardware — 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. Prerequisites: COMP 2510, 2720.

COMPUTING AND ACADEMIC STUDIES



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 — Includes notes and accounts receivable, long-lived assets, liabilities, partnerships and corporations, cash flow, manufacturing 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 — Splits material covered into two sections. 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 Behaviour — 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

Aman Abdulla, Dipl.T., B.Sc(EE), P.Eng., Program Head, Data Communications Systems
Steve Adolph, B.A.(Computing Science), M.Sc. Computing Science
Brian R. Anderson, C.C.P., C.D.P., C.Tech., Program Head, Microcomputer Systems
Robert (Bob) K. Coolidge, Dipl.T.
Kim Dotto, B.Sc., M.A.Sc., P.Eng.
Lynne Garneau, Assistant
Debbe Gervin, Dipl.T., B.Ed., B.A., M.A.
George Kidd, B.Sc.
Michael Lo, B.Sc.(Hons.), M.Sc., Program Head, Advanced Diploma B.Tech. Program Coordinator
Richard Long, C.G.A., Manager, Information Technology Programs (Part-time Studies)
Fred Martin, B.A. (Hons.), M.Sc., F.L.M.I., C.D.P., Program Head, Applied A I
Valerie Nagel, Dipl.T., C.D.P., Program Head, Combined Program Diploma Program Coordinator
Rob Neilson, B.Sc., Program Head, Information Systems
TK Ngai, B.Sc. Computer Science, M.B.A.
James Parry, B. Math.
Mitra Ramkay, B.Sc.
Tejinder Randhawa, B.Sc., M.Sc.
Lucille Sokoloski, Administrative Assistant (Part-time Studies)
Ken Takagaki, B.A., Ph.D., C.M.A., C.D.P., Dean, School of Computing & Academic Studies
Malcolm Turner, M.B.A., Ph.D., P.Eng., Program Head, Decision Systems
Anthony Wong, B.A.Sc., M.Eng., P.Eng.
Benjamin Yu, B.Sc., M.Sc., Ph.D., Program Head, Database Systems

(Part-time and Sessional)

Arthur Bailey
John Blackwell, CCP, CSP, ISP
Tim Dudra
Ashfaq Kapadia

COMPUTING AND ACADEMIC STUDIES

Computer Systems Advisory Committee

D. Finlan, Manager, Technical Services, Canada Safeway Ltd.
K. Brackhaus, President and Chief Operating Officer, Dynapro
D. Finlan, Manager, Technical Services and Operations, Canada Safeway Ltd.
O. Hartviksen,Consultant
G. Horner, Manager, Systems End User Services, Information Services Dept., Insurance Corp. B.C. (Chair)
A. Klopfer, Consultant
W. Kurz, President, Kurz & Associates Enterprises Ltd., (past-Chair)
R. Nielsen, GNA Consulting Group Ltd.
B. Robillard, IBM Canada Ltd.
B. Steele, President and Chief Operating Officer, Westech Information Systems Inc.
D. Stuckert, Partner, Sierra Systems Consultants Inc.

Academic Studies Division

Kent Yakel, B.Sc.(Hons.), M.Sc., Associate Dean
Pam Curtis, Secretary

ACADEMIC STUDIES DIVISION

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 substitutes 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 enrol in engineering-based technology programs at BCIT.

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, daytime classes (usually in the summer term)
- as integrated 15-week packages through the Engineering Technology Entry program, in September, January, and April.

Interested students are encouraged to call (604) 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 (604) 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 (604) 432-8861 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 enrol 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, April, and throughout the summer months. Check the Part-time Studies flyer for dates, or phone (604) 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. Also for School of Electrical and Electronics.
- 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.

COMPUTING AND ACADEMIC STUDIES

Pre-entry Course Descriptions

Limited financial assistance is available to financially needy students registered in COMM 0003, COMM 0004, COMM 0005, and COMM 0008. The deadline for applications for assistance is 21 days before classes start.

For more information on financial assistance for part-time students, please phone (604) 432-8555 or go to the Financial Aid Reception in Student Services, Building SW1, Room 2300. Office hours 0830 - 1630, Monday to Friday.

CHEM 0001 (CHEM 001) Pre-entry Chemistry 1 — Designed as 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. This course is equivalent to CHEM 0010. non-credit.

CHEM 0010 (CHEM 101) Introduction to Applied Chemistry — Taught in Term 1 as part of the Chemical Sciences diploma program. It is not equivalent to Grade 12 and students with Grade 12 chemistry cannot obtain credit for CHEM 1101.

Note: All students wanting to take COMM 0003, 0004, 0005, or 0008 will be registered to take an English Proficiency Test (COMM 0009). The result will determine which course they will be eligible for. It will also decide their eligibility for the program.

COMM 0003 (COMM 006) Career Explorations for EAL — Designed for students who have English as an Additional Language. This course is for students who are able to carry out everyday activities and handle simple conversations in English but need to improve their speaking, listening, reading, and writing skills before pursuing a career and post-secondary studies.

Students will learn the English skills needed to participate in successful interviews with BCIT advisors and instructors in trades and technology. Students will learn how to present their career goals and interests clearly and concisely. They will prepare cards of introduction and resumes, practise filling out application forms, participate in practice interviews, and read about cultural differences. The course will feature guest lecturers from various BCIT programs and from student services at BCIT. All applicants will be registered in COMM 0009 Communication Placement to write an English Proficiency test on the first night of class to determine their eligibility for continuation.

COMM 0004 (COMM 005) Introduction to BCIT for English as an Additional Language (EAL) — Designed for EAL students whose language skills need upgrading before they can enrol in COMM 0005. It includes the speaking, listening, writing and reading skills needed to carry out the writing and speaking tasks in COMM 0005 and in other BCIT courses. In this course, students will learn about the programs offered at BCIT. As they read, write, and talk about these programs, they will cover areas such as classification, cause and effect, comparison and contrast, and process descriptions. Some of the activities used to teach these language skills include comparing and contrasting BCIT programs, interpreting charts and graphs, and editing other students' work.

A grade of less than 65% is a failing grade. A grade of 65% and a passing grade on the Communication Placement Test in this course meets the prerequisite for COMM 0005. All applicants will be registered in COMM 0009 Communication Placement to write an English Proficiency Test on the first night of class to determine their eligibility for continuation.

A grade of 65% in this course will allow enrolment in COMM 0005. Students must write an English Proficiency Test to determine their eligibility to enrol in COMM 0004.

COMM 0005 (COMM 004) Technical English for Second Language Students — Designed for students whose first language is not English, but have good writing skills. It includes the writing, reading, 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. Students will also practice proofreading for major errors in sentence structure, grammar, and vocabulary.

A grade of less than 65% is a failing grade. 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 technologies (a C+ standing in English 12). This course is equivalent to COMM 0007. Prerequisite: All applicants will be registered in COMM 0009 Communication Placement to write an English Proficiency test on the first night of class to determine their eligibility for continuation. If your language skills need upgrading, you will be required to complete COMM 0004 before enrolling in COMM 0005.

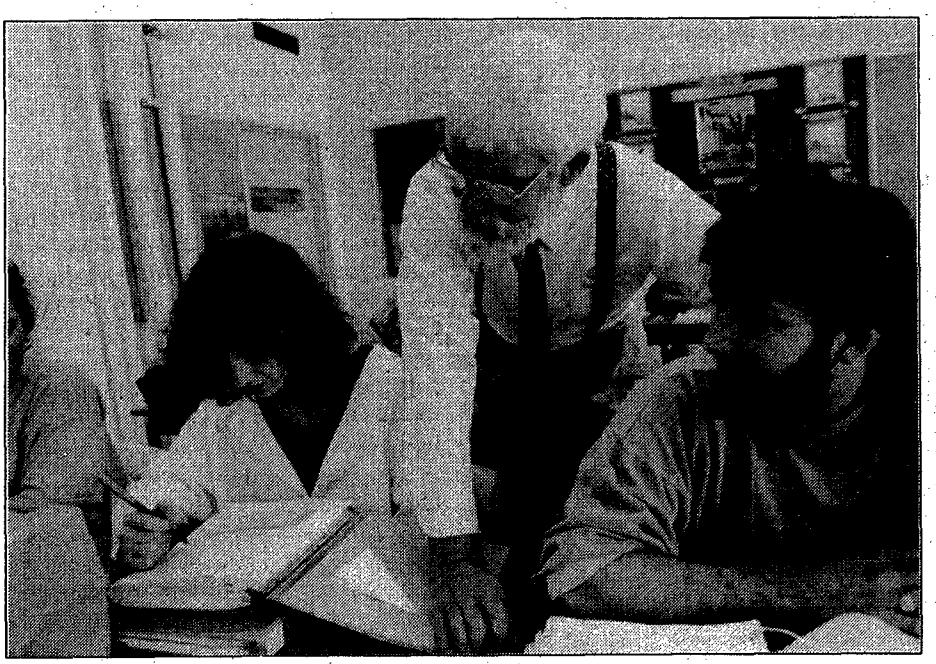
COMM 0008 (COMM 003) Comprehensive Reading, Writing and Learning Skills — Designed for students whose first language is English. It emphasizes the reading, writing and study skills needed for BCIT full-time programs. The course includes efficient reading, library research skills, reading comprehension, grammar, writing fundamentals and speaking skills. This course is equivalent to COMM 0007 and COMM 0005.

A grade of less than 65% is a failing grade. 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+ standing in English 12). Prerequisite: All applicants will be registered in COMM 0009 Communication Placement to write an English Proficiency Test on the first night of class to determine their eligibility for continuation.

COMM 0020 (COMM 002) Independent Learning Skills (24 hours) — Teaches students how to read efficiently, cope with assignments, use computer-managed learning packages, study independently, take exams successfully, manage time and get the most from new instruction techniques. Includes methods for reading textbooks and learning from objectives. non-credit.

MATH 0001 (MATH 001) Technical Mathematics Introduction — Designed as 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 for BCIT Engineering or Health programs. 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. This course is equivalent to MATH 0005. non-credit.

COMPUTING AND ACADEMIC STUDIES



MATH 0002 (MATH 002) Technical Mathematics Introduction (Correspondence) — Designed as a flexible entry correspondence course that satisfies the Math 12 entrance requirement for BCIT. Students intending to enter a BCIT Engineering or Health 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 part-time offering — MATH 0001). Prerequisite: A pass in Math 11 or an approved equivalent mathematics course. non-credit.

Refresher Course Descriptions

MATH 0004 (MATH 003) Refresher Mathematics — Reviews 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 Grade 11 Physics concepts which are important for success in most first-year physics courses at BCIT. This course is not a substitute for PHYS 0309. Topics include vectors, kinematics, dynamics, equilibrium, circular motion, mechanical energy and power. There will be some lab exercises, and problem-solving skills will be emphasized. This course is recommended for students who have taken Grade 11 Physics more than one year ago, and need some review in order to refresh their skills. Prerequisite: Physics 11 or equivalent. non-credit.

PHYS 0309 (PHYS 009) Pre-entry and ETE Physics – Meets the PHYS 11 entrance requirement for BCIT programs. It offers an introduction to the basic principles and common applications of physics. Approximately two-fifths of this course deals with mechanics, the remainder with heat and electricity (electrostatics and DC circuits). Problem solving techniques are emphasized. Prerequisite: You are advised to have completed any necessary math upgrading courses before taking PHYS 0309. non-credit.

Faculty and Staff:

Chemistry Department
Shirley Reynolds B.A.Sc. (Hons.), M.Sc., Program Head
Pam Curtis, Secretary
Graham Anderson, M.I.Sc.T. (U.K.), M.C.I.C., A.Sc.T.
Edwin Chan, B.Sc., M.Sc.
Dave Conder, B.Sc., M.Sc.
Rosamaria Fong, B.Sc. (Hons.), M.Sc.
Hilary Fraser, Dipl.Tech.
Cheryl Heady, Dipl.Tech.
Kevin Hoy, B.Sc. (Hons.), Ph.D.
Tim Mepham, M.Sc., C.Chem., M.R.S.C.
Marilyn Pickering, C.Tech., A.S.T.T.
Joe Salvo, B.Sc. (Hons.), B.Ed.
Kevin Soulsbury, B.Sc., Ph.D
Richard Tam, Dipl.Tech. CC.T., M.C.I.C., M.A.C.S.

Communication Department

David Helgesen, B.A., M.B.A.
Judy Beresnak, Secretary
Nargis Abraham, Ph.D.
Patrick Burns, B.A., M.A., Program Head, Personnel
Rider Cooey, B.A. (Hons.)
Clark Cook, B.A. (Hons.), Program Head, Administration
Grant Douglas, B.Ed., M.Ed.
Sue Fahey, B.A., M.A.
Dale Fitzpatrick, B.Journ., M.A., Program Head, Pre-Entry
Linda Hale, B.A., M.A.
David Hamilton, B.Sc.
Sharon Helgesen, B.A., Cert. Adult Literacy
Dennis Johnston, B.Ed., Program Head, Curriculum
Valda-Jean Johnston, B.A., B.Ed.
Wayne Kean, B.A., M.A.
David Kipling. F.E.T.C., A.L.A. (U.K.)
Richard Lund, B.A. (Hons.), M.A.
David McNeal, B.A., M.A., Ph.D.
Pat Murray, B.A., R.T.
Jennifer Nachlas, B.A. (Hons.), M.A., Ph.D.
Bill Oaksford, B.A., M.A.
Michael Otte, B.A. (Hons.), M.A.
Lorraine Robson, B.A., M.A.
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.

COMPUTING AND ACADEMIC STUDIES

Mathematics Department

Eric Hiob, B.Sc., M.Sc., Ph.D., Program Head
Camille Abel, Secretary
Maria Bojadziev, Dip. Ing.
Ross Bradbeer, B.Sc., M.Sc.
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.
Michele Hemphill, B.A.Sc., P.Eng.
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.), M.Sc., Ph.D.
Val Sawadsky, B.A., B.Sc. (Hons.)
Endre Toth, B.Sc.

Physics Department

Donna MacDuff, B.Sc., Cert.Ed., Program Head
Rosalie Loverock, Secretary
John Betts, B.Sc., M.Sc.
Gary Bodnar
Cor Deurzen, B.Sc., M.A., Ph.D.
Frank DiSpirito, B.A.Sc, M.A.Sc.
Brian Gaensbauer, Dipl.Tech.
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.
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.
Randall Woods, B.Sc., M.Sc., M.A.Sc.

ENGINEERING TECHNOLOGY ENTRY

Upgrading Program

This program provides academic upgrading to students wishing to enrol in engineering-based technology programs at BCIT. At present, the following technology programs have articulated arrangements to accept graduates from the ETE program: Computer Systems Technology; Electronics Engineering Technology; Biotechnology; Building Technology; CAD/CAM; Chemical Sciences Technology; Civil and Structural Technology; Fish, Wildlife and Recreation; Food Technology; Forestry; Mechanical Design, Manufacturing and Systems Technologies; Petroleum and Natural Gas; Plastics; Robotics and Automation; Surveying and Mapping; Wood Products Manufacturing; Biomedical Engineering Technology; Occupational Health and Safety.

The ETE program provides courses in chemistry, communication, mathematics and physics which meet technology program prerequisites in the above areas. The program also includes an introductory course in computer applications and a general interest seminar course. Some technology programs offer opportunities for students to take an optional technology level credit course while enrolled in the ETE program.

A student may choose not to take either the physics or the chemistry course if that course is not a prerequisite for the technology program in which the student plans to enrol, but is expected to take all other courses in the program. The program is designed to emulate the workload of subsequent technology programs, familiarize the student with BCIT and provide academic and study skills to enable a student to succeed in subsequent technology programs.

Some technology programs have prerequisite requirements not offered by the ETE program, such as computer programming or biology courses. Please check calendar entries for individual programs which list prerequisites and preferred attributes.

Students enrolled in the ETE program are provisionally accepted into an engineering-based technology program in a subsequent term, subject to satisfactory completion of the ETE program with marks equivalent to technology prerequisites. The marks required vary with technology program chosen. Provisional acceptance is based on marks obtained in ETE and these marks take precedence over previous course marks where applicable.

Additional assessment of student applications is required for some programs. Additional coursework outside the ETE program and/or personal interviews may be required before provisional acceptance is offered. There are annual enrolment limits for programs which accept ETE students, which may affect acceptance into the ETE program. Applicants may be asked to make a second program choice if there are no more seats available in the first program choice.

Please note: Because Electronics Engineering Technology has a January intake, preference will be given to prospective Electronics applicants when accepting applicants into the September intake of the ETE program. ETE applicants applying for subsequent programs other than Electronics, will have a better chance of entering ETE in the January and April intakes.

Program Length

Fifteen weeks, full-time beginning in September, January and April. Chemistry is not offered in the September session. Students needing chemistry should enrol in January or April.

Prerequisites

English 11 and Mathematics 11 or the equivalents, with a C or better, completed within eight years of application date. A written submission of interest and intent is required at the time of application. Preference is given to those applicants who have passed at least one Grade 11 level science course. Eligible courses are biology, chemistry, earth science, physics and technology. Depending on the technology program the student wishes to enter following ETE, specific grade requirements will need to be achieved in ETE courses.

COMPUTING AND ACADEMIC STUDIES

Program: ETE

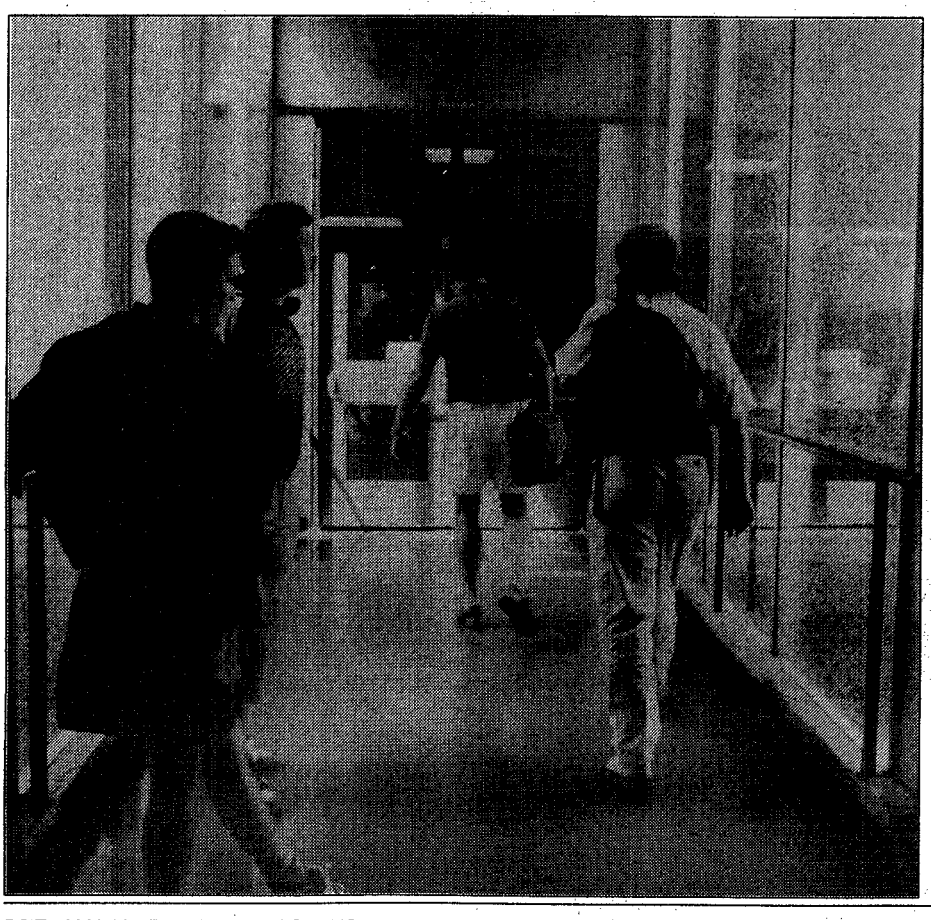
		hrs/wk	credits
CHEM	0010	Introductory Applied Chemistry	6.0
COMM	0007	Introductory Communication	6.0
COMP	0107	Computer Literacy	3.0
MATH	0005	Introductory Technical Mathematics	7.0
NTRY	0301	Technology Entry Seminar	1.0
PHYS	0309	Pre-entry and ETE Physics	7.0

The ETE program curriculum undergoes frequent revision to reflect the changing needs of students and technology. Current courses may therefore vary from this calendar. For additional information about the ETE program, call BCIT Student Services at (604) 434-3304 or toll-free at 1-800-667-0676.

Course Descriptions

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 less than 65% is a failing grade. 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 most technologies. non-credit



COMP 0107 (COMP 010) Computer Literacy – Introduces students to problem solving in a computer environment. Topics covered are technology and terminology overview, DOS, word processing and spreadsheets. Emphasis is on the use of standard problem-solving techniques for a variety of engineering applications.

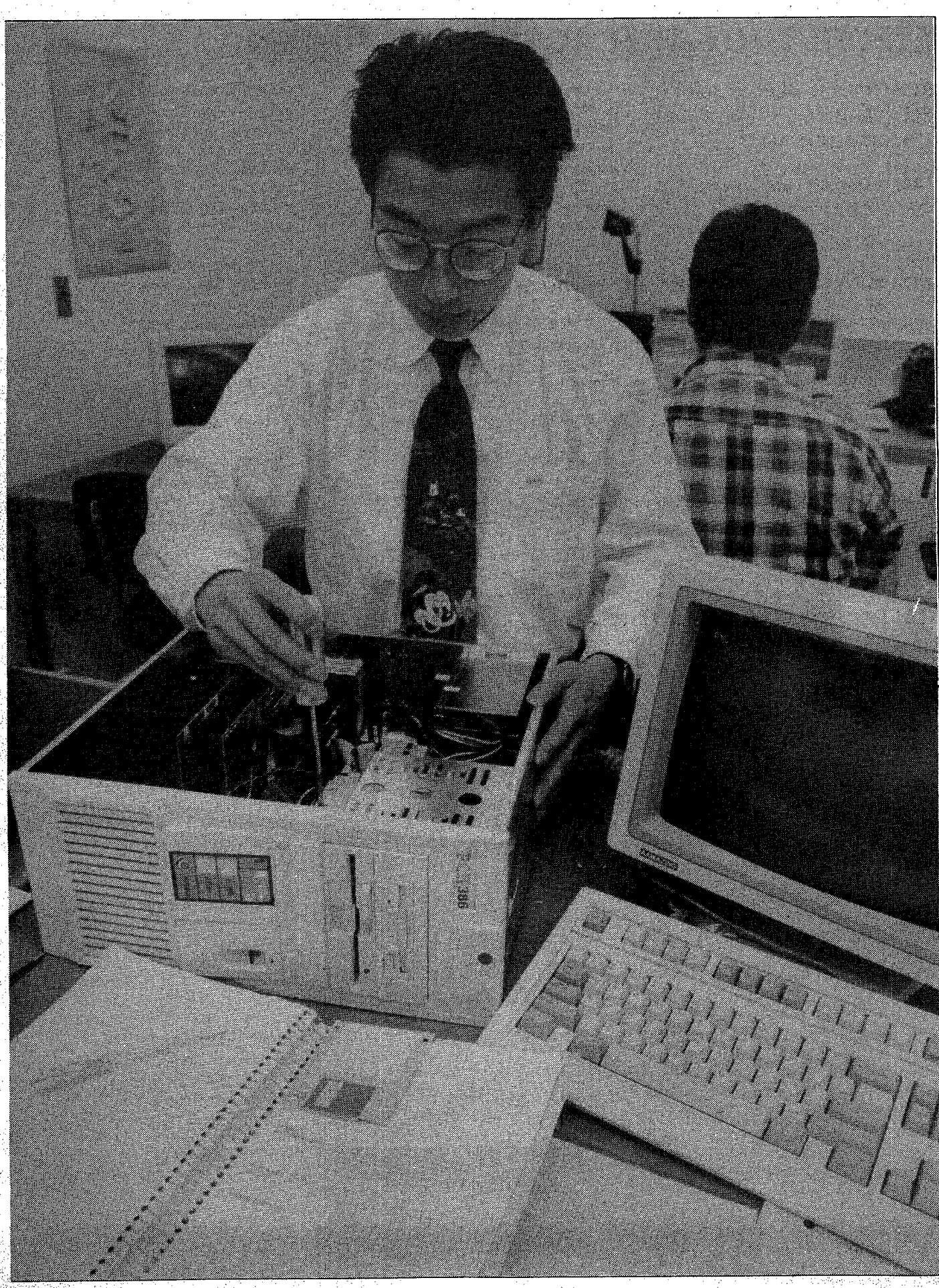
MATH 0005 (MATH 005) Introductory Technical Mathematics – Covers those topics in technical mathematics which are important for success in BCIT programs with Mathematics 12 as a prerequisite. Topics include algebraic operations, simple equations, ratios, basic geometry, quadratic equations, logarithms, 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. 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. non-credit

PHYS 0309 (PHYS 009) Pre-entry and ETE Physics – Meets the PHYS 11 entrance requirement for BCIT programs. It offers an introduction to the basic principles and common applications of physics. Approximately two-fifths of this course deals with mechanics, the remainder with heat and electricity (electrostatics and DC circuits). Problem solving techniques are emphasized. Prerequisite: You are advised to have completed any necessary math upgrading courses before taking PHYS 0309. non-credit

Faculty and Staff

Kent Yakel, B.Sc. (Hons)., M.Sc., Associate Dean
Donna MacDuff, B.Sc., Cert. Ed., Program Head
Pam Curtis, Secretary



ELECTRICAL & ELECTRONIC TECHNOLOGY

SCHOOL OF ELECTRICAL AND ELECTRONIC TECHNOLOGY

ELECTRICAL & 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 a 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

Michael J. Jervis, B.Sc., Dean
Holly Stanley, Administrative Officer

Electronic Engineering Technology

Michael J. Jervis, B.Sc., Associate Dean

Automation and Instrumentation Technology
Computer Control Technology
Electrical Power Technology
Telecommunications Technology

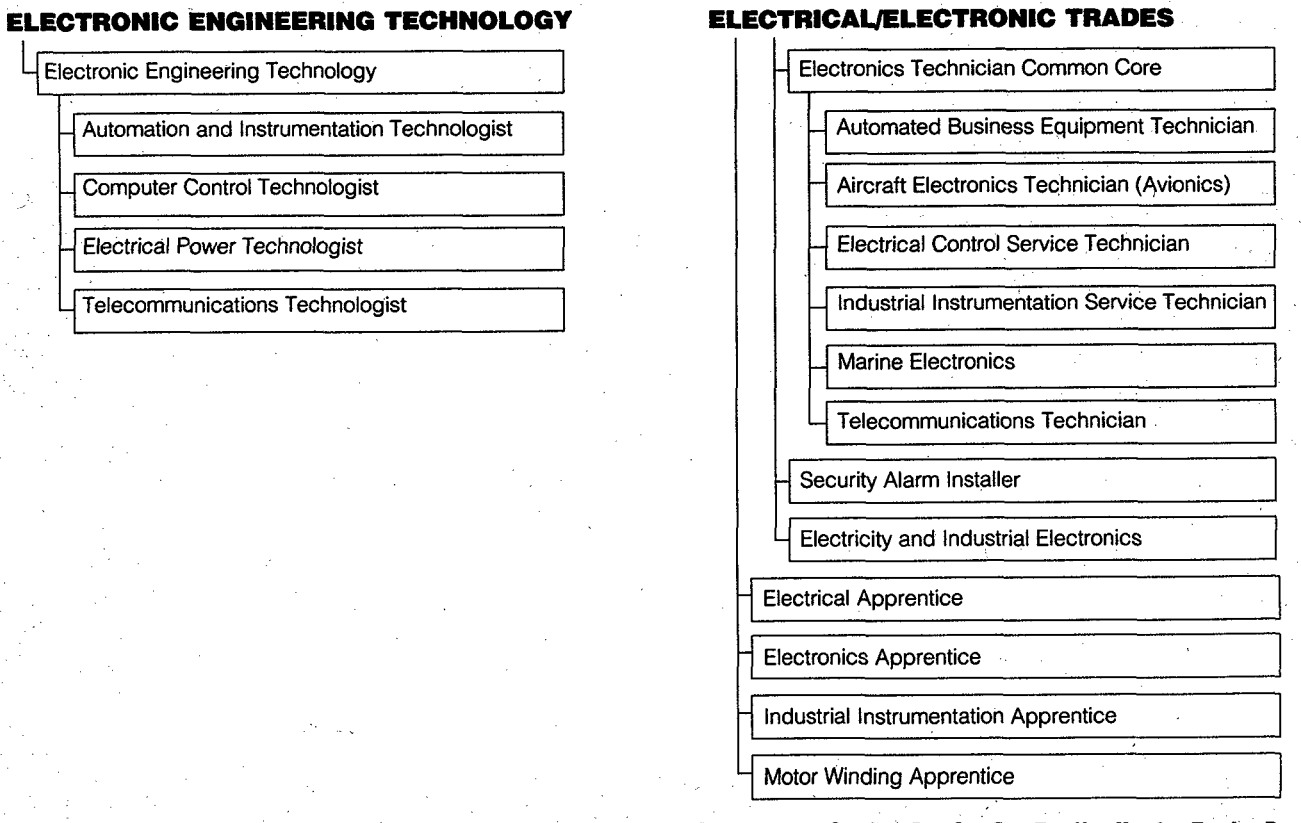
Electrical/Electronic Trades

Dennis C. Duffey, Associate Dean

Automated Business Equipment Technician
Electrical Control Service Technician
Electricity and Industrial Electronics
Electronics Technician Common Core Program
Industrial Instrumentation Service Technician
Marine Electronics Service Technician
Security Alarm Installer
Telecommunications Technician

For Information Sessions held throughout the year, contact Student Services at (604) 434-3304.

SCHOOL OF ELECTRICAL AND ELECTRONIC TECHNOLOGY



CONTINUING EDUCATION OPPORTUNITIES

- BRIDGE TO UNIVERSITY ENGINEERING PROGRAMS
- TECHNOLOGY PART-TIME STUDIES
- TRADES PART-TIME STUDIES
- APPRENTICESHIP & JOURNEYPERSON TRAINING

ELECTRICAL & ELECTRONIC TECHNOLOGY

ELECTRONIC ENGINEERING TECHNOLOGY

Diploma of Technology Programs

- Automation and Instrumentation Technology
- Computer Control Technology
- Electrical Power Technology
- Telecommunications Technology

Common First Year

The Automation and Instrumentation, Computer Control, Electrical Power, and Telecommunications programs share a common first year of a two-year program. On successful completion of the first year, students select the appropriate option to complete the diploma requirements.

Note: The Electronics industry is a fast moving, high technology field. All courses are constantly under review with industry and Advisory Committees.

Program Length

Two years, full-time beginning in September and February each year.

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 of credits to other universities is possible on an individual basis.

Accreditation

The programs of Electronic Engineering Technology are accredited to national standards by the Applied Science Technologists and Technicians of B.C.

Prerequisites

For first-year applicants: High School graduation with English (C), Math 12 (C+) and Physics 11 (C+) or Physics 12 (Pass), where Physics 12 is preferred, or Engineering Technology Entry program (15 weeks). The prerequisites for entry into individual courses are listed with the course descriptions. Program information session dates are available at Student Services, (604) 434-3304.

Direct Entry

Applicants with post-secondary academic achievement may apply for advanced standing in the program. The applicants are assessed individually. 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.

Cooperative Education

Cooperative Education, providing paid work experience, can be an integral part of the Electronic 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 inserted between terms of academic study after Level 2. The industrial experience gained in the Co-op component of the program makes a student more immediately valuable to prospective employers. A full description of the Cooperative Education program is at the beginning of the calendar (page 11).

Common First-year Courses

Level 1 (17 weeks)		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

Level 2 (17 weeks)

ELEX 2105	Circuit Analysis 2	5.0	5.5
ELEX 2115	Digital Techniques 2	6.0	7.0
ELEX 2120	Electronic Circuits 1	6.0	7.0
ELEX 2125	C Programming	4.0	4.5
MATH2431	Calculus for Electronics	6.0	7.0
PHYS 2143	Physics for Electronics 2	4.0	4.5

Co-op 1

ELEX 2990	Co-op 1	15.0

ELECTRICAL & ELECTRONIC TECHNOLOGY

AUTOMATION AND INSTRUMENTATION TECHNOLOGY

Diploma of Technology Program

This program provides students with the knowledge and practical skills to work in the field of instrumentation, measurement, data analysis, automation, and process control. Students develop the ability to analyze, troubleshoot and design the complex computer-based systems used in sophisticated industrial and commercial systems.

Job Opportunities

Graduates of the program work in industries that apply electronic and computer-based control equipment to the automation of processes and systems. These include industries such as materials handling, petrochemical, building automation, food processing, wood products, pulp and paper, natural gas distribution and manufacturing. These specialists utilize their multi-disciplinary skills to interface computer and electronic systems to pneumatic, hydraulic, mechanical and process systems. Students graduating from the program have a wide choice of career opportunities in the fields of engineering consulting, system design and development, technical field support, technical sales and research. With appropriate job experience, accomplished graduates often move into supervisory positions.

Program Length

The program consists of two 17-week terms (Levels 3 and 4), which are both offered every February and September. Registration is on a course-by-course basis for flexibility in accommodating special situations.

Degree Transfer/Completion

Bridge programs are available from the Automation and Instrumentation Technology program to University of Victoria and Lakehead University engineering programs. Alternatively, transfer credit to UBC and SFU degree programs is available on an individual basis.

Accreditation

The Automation and Instrumentation program is accredited to national standards by the Applied Science Technologists and Technicians of B.C.

Prerequisites

Successful completion of Levels 1 and 2 of the Electronic Engineering Technology program, or equivalent. Students may be admitted to individual courses in the program, provided they have the course prerequisites, if seats are available.

Direct Entry

Students may, on an individual basis, be admitted directly into Level 3 of the program if, in the opinion of BCIT, they have acquired elsewhere the knowledge and skills they would have gained in Levels 1 and 2 of the Electronic Engineering Technology program.

Program Content

A comprehensive study of control strategies, measurement techniques, and electronic and computer systems used in the automatic control of commercial and industrial operations is undertaken. A strong component of the program involves the student developing relevant, practical skills on industrial equipment used in modern, well equipped labs. The student will graduate with a solid foundation in automatic measurement and control systems. The Automation and Instrumentation program follows the successful completion of the first year of study in Electronic Engineering Technology. We encourage students with an appropriate college or university background to apply for direct entry into the program.

Program: AUTOMATION AND INSTRUMENTATION TECHNOLOGY

Second-year courses Level 3			3A (8 weeks) hrs	3B (9 weeks) hrs	credits
CHEM	3303	Chemical Systems and Sensors	—	4.0	2.0
CHSC	3342	Industrial Process Fundamentals	4.0	4.0	4.5
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	Micro-controller Systems 1	6.0	6.0	7.0
MATH	3431	Transform Calculus Electronics	4.0	—	3.0
Co-op 2 (Optional for all programs after completion of Level 3)					
ELEX	3990	Co-op 2	15.0		
Level 4					
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	PLCs 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

Cooperative Education

Automation and Instrumentation Technology students are encouraged (but are not required) to participate in Cooperative Education, described in detail on page 11.

ELECTRICAL & ELECTRONIC TECHNOLOGY

COMPUTER CONTROL TECHNOLOGY

Diploma of Technology Program

A broad based program which provides the necessary background for entry into a wide variety of areas in the electronics industry. Students will learn how to write software (for a Personal Computer and Microcontroller) and design electronics circuitry to sense and control events. In the electronics industry of today, the combination of good programming and electronic circuit design skills is highly desirable, especially for the large number of companies involved in the design and development of Control and Data Acquisition products.

Job Opportunities

Graduates from this program find employment as Engineering Technologists in design, manufacturing and technical support in areas such as sawmill automation equipment, operator control equipment for heavy machinery, digital communication networks, computers and peripheral devices, marine autopilot and sonar systems, traffic control systems, building control systems, switching power supply equipment, airline booking and display systems, credit card access and point of transaction systems, satellite data analysis systems, ski lift control systems, and theatre lighting control systems. Typical companies that employ graduates from this program are MDA, Dynapro Systems, Epic Data, Triumf, Prism Systems, VTech Engineering, Alpha Technologies, Honeywell, IBM, Merit Digital, Kita Engineering, Statpower, and Simrad Mesotech.

Program Length

The program consists of two 17-week terms (Levels 3 and 4), which are both offered every February and September. Registration is done on a course-by-course basis for flexibility in accommodating special situations.

Degree Transfer

Bridge programs are in place from the Computer Control Technology program to University of Victoria and Lakehead University engineering programs. Alternatively, transfer credit to UBC and SFU degree programs is available on an individual basis.

Accreditation

The Computer Control Technology program is accredited to national standards by the Applied Science Technologists and Technicians of B.C.

Prerequisites

Successful completion of Levels 1 and 2 of the Electronic Engineering Technology program, or equivalent. Students may be admitted to individual courses in the program, provided they have the course prerequisites, if seats are available.

Direct Entry

Students may, on an individual basis, be admitted directly into Level 3 of the program if, in the opinion of BCIT, they have acquired elsewhere the knowledge and skills they would have gained in Levels 1 and 2 of the Electronic Engineering Technology program.

Program Content

The main topics covered 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), electrical machines and devices, industrial electronics (e.g. switching power supply design), 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. To be eligible for graduation, each student is required to complete a technical project. Some of these projects are performed in partnership with industry.

Program: COMPUTER CONTROL TECHNOLOGY

Second-year courses Level 3			3A (8 weeks) hrs	3B (9 weeks) hrs	credits
ELEX	3305	Microcontroller Systems 1	6.0	6.0	7.0
ELEX	3310	Pulse Techniques	4.0	5.0	5.0
ELEX	3315	Applications Software	5.0	4.0	5.0
ELEX	3320	Electronic Circuits 2	6.0	6.0	7.0
ELEX	3325	Electrical Equipment	5.0	5.0	6.0
ELEX	4305	Programmable Logic Devices	—	4.0	2.0
MATH	3431	Transform Calculus Electronics	4.0	—	3.0

Co-op 2
(Optional for all programs after completion of Level 3)

ELEX	3990	Co-op 2	15.0		
Level 4			**4A (8 weeks)**	**4B (9 weeks)**	**credits**
COMM	2443	Technical Writing for Electronics	3.0	3.0	3.5
ELEX	4315	Applied Electronic Circuits	7.0	5.0	7.0
ELEX	4320	Industrial Electronics and PLCs	6.0	6.0	7.0
ELEX	4325	Microcontroller Systems 2	6.0	6.0	7.0
ELEX	4330	Technical Project (Control)	2.0	4.0	3.5
ELEX	4510	Data Communication	6.0	6.0	7.0
OPMT	1165	Project Management	2.0	—	1.0

Cooperative Education

Computer Control Technology students are encouraged (but are not required) to participate in Cooperative Education, described in detail on page 11.

ELECTRICAL & ELECTRONIC TECHNOLOGY

ELECTRICAL POWER TECHNOLOGY

Diploma of Technology Program

Upon completion of this program graduates will be able to calculate short circuit currents; coordinate fuses, circuit breakers and protective relays; measure power system harmonics and design power distribution systems to control their effect; design lighting systems; program Programmable Logic Controllers for motor and industrial control systems; design, construct, test, and troubleshoot switching power supplies; construct, test, and troubleshoot Silicon Controlled Rectifier motor speed control systems; and synchronize generators to the power system.

Job Opportunities

Graduates of the program may work as Protection and control technologists with BC Hydro; customer service and distribution designers with BC Hydro; project manager-estimators with electrical contractors; designer and designer assistants with electrical consultants; high voltage insulation testers with BC Hydro; field "engineers" with electrical supply companies; commissioning and troubleshooting personnel with electrical manufacturers; commissioning, testing and maintenance personnel with BC Transit; construction supervisors with BC Hydro; and highway lighting designers with the Department of Highways.

Program Length

The program consists of one 17-week term (Level 4), which is offered every February. Registration is available on a course-by-course basis for flexibility in accommodating special situations.

Degree Transfer/Completion

Bridge programs are in place from the Electrical Power Technology program to the University of Victoria and Lakehead University engineering programs. Alternatively, transfer credit to UBC and SFU degree programs is available on an individual basis.

Accreditation

The Electrical Power Technology program is accredited to national standards by the Applied Science Technologists and Technicians of B.C.

Prerequisites

Completion of Level 3 Computer Control Technology or graduation from the Telecommunications or Automation and Instrumentation programs. For entry from other institutes, colleges, or universities, please contact Ernie Hancock, Program Head, (604) 432-8253.

Direct Entry

Students may, on an individual basis, be admitted directly into Level 3 of the program if, in the opinion of BCIT, they have acquired elsewhere the knowledge and skills they would have gained in Levels 1 and 2 of the Electronic Engineering Technology program.

Program Content

This program prepares students for careers at the Engineering Technologist level in the areas of electrical utility systems, consulting engineering, electrical manufacturing, electrical contracting, general, primary and secondary manufacturing and governmental agencies. The program provides graduates with the basic knowledge and skills necessary to enter these fields in the areas of design, installation, maintenance, production and sales.

This program builds confidence and broadens knowledge for the student who has previously specialized in microcomputers, telecommunications, or instrumentation. A combination of Electrical Power and the above specialties improves confidence and employability.

The Electrical Power Technology program gives Electronic Engineering Technology graduates a foundation in Electrical Power equipment, Industrial Electronics, and the design of Industrial Power Distribution systems.

Program: ELECTRICAL POWER TECHNOLOGY

Second-year courses Level 3			3A (8 weeks) hrs	3B (9 weeks) hrs	credits
ELEX	3305	Microcontroller Systems 1	6.0	6.0	7.0
ELEX	3310	Pulse Techniques	5.0	5.0	5.0
ELEX	3315	Applications Software	5.0	5.0	5.0
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
ELEX	4305	Programmable Logic Devices*	—	4.0	2.0
OPMT	1165	Project Management*	2.0	—	1.0

*Students may take ELEX 4305 or as an alternate OPMT 1165.

Co-op 2
(Optional for all programs after completion of Level 3)

ELEX	3990	Co-op 2			

Level 4			4A (8 weeks)	4B (9 weeks)	credits
COMM	2443	Technical Writing for Electronics	3.0	3.0	3.5
ELEX	4320	Industrial Electronics and PLCs	6.0	6.0	7.0
ELEX	4405	Industrial Systems	8.0	6.0	8.0
ELEX	4410	Power Systems	6.0	6.0	7.0
ELEX	4415	Electrical Equipment and PLCs	7.0	7.0	8.0
ELEX	4430	Technical Project (Power)	—	4.0	2.5

ELECTRICAL & ELECTRONIC TECHNOLOGY

TELECOMMUNICATIONS TECHNOLOGY
Diploma of Technology Program

This program will prepare students for a career as an engineering technologist in the telecommunications industry. Building on the knowledge and skills gained in the first year of the Electronic Engineering Technology program, students will learn the principles of telecommunications, and from these principles develop complete telecommunications systems. These systems vary all the way from marine, avionic and land mobile radio to digital data transmission networks. Also included in the program are cellular radio systems, fibre optic links, microwave links, satellite communication systems, local area networks (LANs), broadcast radio and TV, and digital and computer control and testing of communications equipment and systems.

Job Opportunities
Telecommunications has been described as the industry of the future. Graduates of the program may expect to find employment in the areas of design, development, production, technical sales and support, installation and maintenance. With experience, many graduates move into supervisory and technical management positions. Employers include commercial companies, government agencies and educational institutions.

Program Length
The program consists of two 17-week terms (Levels 3 and 4), which are both offered each February and September. Registration is done on a course-by-course basis for flexibility in accommodating special situations.

Degree Transfer/Completion
Bridge programs are in place from BCIT to Lakehead University and the University of Victoria, allowing Technology graduates to complete an accredited Electrical Engineering Degree. Transfer of credits to other universities is possible on an individual basis.

Accreditation
This technology program is accredited to national standards by the Applied Science Technologists and Technicians of B.C.

Prerequisites
Successful completion of Levels 1 and 2 of the Electronic Engineering Technology program, or equivalent. Students may be admitted to individual courses in the program, provided they have the course prerequisites, if seats are available.

Direct Entry
Students may, on an individual basis, be admitted directly into Level 3 of the program if, in the opinion of BCIT, they have acquired elsewhere the knowledge and skills they would have gained in Levels 1 and 2 of the Electronic Engineering Technology program.

Program Content
Levels 1 and 2 of the Electronic Engineering Technology program (common to all four specialized technology programs) provide a solid grounding in basic electrical and electronic knowledge and skills supported by a strengthening of the student's knowledge of Physics, Math and Technical English. The following courses are taken in Levels 3 and 4 in the Telecommunications Technology program.

Program: TELECOMMUNICATIONS TECHNOLOGY

Second-year courses Level 3			3A (8 weeks) hrs	3B (9 weeks) hrs	credits
ELEX	3305	Microcontroller Systems 1	6.0	6.0	7.0
ELEX	3310	Pulse Techniques	4.0	5.0	5.0
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

Co-op 2
(Optional for all programs after completion of Level 3)

ELEX	3990	Co-op 2	15.0		

Level 4			4A (8 weeks)	4B (9 weeks)	credits
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	6.0	-	3.5

Cooperative Education
Telecommunications Technology students are encouraged (but are not required) to participate in Cooperative Education, described in detail on page 11.

ELECTRICAL & ELECTRONIC TECHNOLOGY

ELECTRONIC ENGINEERING TECHNOLOGY

Course Descriptions

CHEM 3303 (CHEM 302) Chemical Systems and Sensors — Teaches the student the principles and applications of chemistry, chemical reactions and analytical measurements, enabling the student to communicate effectively with plant chemists and engineers. Topics include stoichiometry, chemical reactions (endothermic and exothermic), chemical equilibrium, acid-base titrations and their application to pH and conductivity measurements. Prerequisite: ELEX 2105, ELEX 2120.

CHSC 3342 (CHSC 343) Industrial Process Fundamentals — Before suitable measurement and automatic process control strategies can be designed and implemented, a detailed knowledge of the behaviour of that process is required. This course 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 concepts of heat transfer and energy balance. Prerequisite: MATH 2431, PHYS 2143.

COMM 1143 (TCOM 114) Technical Writing 1 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, a formal lab report and an operating manual. Students also write a resume and application letter for Co-op, and give short, informative presentations to small groups. Prerequisite: English 12 C.

COMM 2443 (TCOM 214) Technical Writing 2 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, and 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. Prerequisite: Math 12 C+.

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 (PC) 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 printing wiring board (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 composed of electronic logic gates. A TTL data book will be used 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 with 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 industry 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 behaviour 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; magnitude comparators; twos complement arithmetic hardware; sequential logic devices (D, J-K, and T flip-flops); counters; count decoding and displays; shift registers; serial and parallel data manipulation circuits; gathering and interpretation of electrical specifications from data books (noise margins, propagation delay and loading considerations); interfacing techniques to discrete devices; digital data multiplexing; and bus structures and techniques. Prerequisite: ELEX 1105, ELEX 1115, COMM 1143, MATH 1431, ELEX 2120* (*recommended to be taken concurrently).

ELECTRICAL & ELECTRONIC TECHNOLOGY

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, COMM 1143 (*must be taken concurrently) and PHYS 1143 or 1163.

ELEX 2125 (ELEX 205) C Programming for Electronics — An introductory course in microcomputer use, DOS, C language programming, and software development. The Intel-based personal computer is used throughout this course for interactive student training. The main part of the course covers program development in C. The programming assignments are based on engineering applications. Students will also learn to document and debug software 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 Levels 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 two-wire current loop. A strong practical approach is ensured by lab exercises and projects. Prerequisite: 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 ready-made interface, using the C language to activate both digital and analog I/O. The second part covers the process from conception to production of an electronic project. Students will use commercial software packages to draw a schematic, generate a net list, lay out and verify a printed circuit board, produce photo-ready artwork and prepare mechanical drawings. Prerequisite: ELEX 1110, 2115, 2125.

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, MATH 3431* (*may be taken concurrently).

ELEX 3325 (ELEX 314) Electrical Equipment — This course introduces electrical power distribution systems and electromechanical 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 3990 and ELEX 4990 will add the notation COOPERATIVE EDUCATION to the Diploma of Technology offered by Electronic Engineering 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 3303.

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 3342 (*may be taken concurrently).

ELEX 4220 (ELEX 444) PLCs 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 (PLCs). 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 3342.

ELEX 4305 (ELEX 411) Programmable Logic Devices — Introduction to user-programmable logic devices including PALs, FPLAs and EPLDs. 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 2115.

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/PLCs — 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 SCRs and TRIACs 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 (PLCs). Prerequisite: ELEX 3320 or 3515 or 3210, 3310 or 3205, PHYS 2143.

ELEX 4325 (ELEX 416) Microcontroller Systems 2 — This course continues the work done in ELEX 3305 on the HC11 single chip microcontroller and its use in Control and Data Acquisition applications. The main topics covered are handshaking protocols; HC11 timer system and its applications; DC Motor and Stepper Motor Control; SPI and SCI Data Communication; HC11 in expanded multiplexed mode; use of logic analyzer and program simulator for fault-finding and analyzing instruction execution; interrupt prioritization. Prerequisite: ELEX 3305, 3310.

ELEX 4330 (ELEX 419) Technical Project (Control) — In this course students are required to research, design and prototype a technical project within their field of interest. A formal written report and oral presentation are required. Projects may be undertaken individually or in small teams. Prerequisite: ELEX 3325 or 3405, 4305, 4510*, 4315*, 4320*, 4325*, COMM 2443*, (*may be taken concurrently), OPMT 1165* *(**must 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 coordination 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 PLCs — 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 PLCs 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 colour), 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 protocols used in digital communication and computer networks. The ISO-OSI reference model is presented with emphasis on the physical, data link, network and application layers. Topics include RS232D & RS485 interface standards; NRZ and Manchester encoding; synchronous PC terminal emulation using the C programming language; VRC, checksum, and CRC error detection schemes; modem modulation techniques and the Hayes AT command set; data telemetry and A/D conversion; XModem and IPX protocols; Novell Netware file server and workstation software installation; Ethernet LAN software, hardware and traffic considerations. This course is intended for the electronic technologist involved in hands-on work with data communications 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 signaling, 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 designed and drafting), Micro-Cap (analog circuit simulation and analysis), and Lotus 123 (a spreadsheet). 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 networks. Logarithmic and exponential functions, 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 conversions, and phasor representation of sinusoidal waveforms applied to AC networks. The derivative, differentiation, implicit differentiation, maxima/minima applied to electrical functions. Prerequisite: Math 12 C+.

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 Level 2.

OPMT 1165 Project Management (Computer Control) — This course runs in conjunction with the Technical Project course for Computer Control (ELEX 4330). It is designed to assist students in the management of their technical project. Topics include the use of proper documentation in the development phase of a project; materials requirements planning; practical quality improvement concepts used in product development; the team approach to problem solving; project scheduling (CPM); ISO 9000 standards in project development; library skills. Prerequisite: ELEX 4330* (*must be taken concurrently).

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 simple harmonic motion, and basic electrostatics and dynamics (electric charge, potential, field, and energy). The labs emphasize measurement, data analysis and experimental techniques as they relate to the lecture material. Prerequisite: Physics 11 C+ or Physics 12 Pass, Math 12 C+.

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, or equivalent.

*Enrolment in the Cooperative Education component is optional. See page 11 for more details.

Faculty and Staff

M. Jervis, B.Sc., Associate Dean
H. Mathieson, Secretary to Associate Dean
R. Bailey, Dipl.T., A.Sc.T.
R. Beketa, Dipl.T.
U.R. Bottcher
L. Boyle, Dipl.T., B.Sc., A.Sc.T.,
J.H. Casimir, B.A.Sc., P.Eng.
T.W. Coghlan, Dipl.T., A.Sc.T.
N. Cousins, B.Sc., P.Eng.
A. Dunlop, Dipl.T.
P. Fenske, Dipl.T.
D. Finlayson, Dipl.T.
K. Gandham, B.Sc., M.Sc.
J. Gascoyne, Dipl.T.
T.J. Glave, B.Sc. (Eng.), P.Eng., Program Head (Telecommunications Technology)
E.G. Hancock, Dipl.T., B.Eng., P.Eng., Program Head (Electrical Power Technology and Part-time Studies)
J. Hayes, Dipl.T., A.Sc.T.
M. Inch, B.A.Sc., P.Eng.
R. Jones, P.Eng., Program Head (Computer Control Technology)
K. Kajiwara, Dipl.T., A.Sc.T.
E. Kenward, B.Sc.
M. Lane, Dipl.T., B.A.Sc.
J. Leibel
J. Maidens, Dipl.T.
W.F. Miklas, Dipl.T., A.Sc.T.
D. Miluch, B.Sc., P.Eng.
E. Murru, B.A.Sc., P.Eng
G. Pellegrin, B.A.Sc., P.Eng.
M.G.R. Phillips, B.Sc., Ph.D.
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V. Read, B.Sc., Dipl.T.
D. Rees-Thomas, B.Sc., A.Sc.T.
I. Ross, B.Sc. (Hons.)
R.T. Russell
J.W. Schoonover, Dipl.T., A.Sc.T., Program Head (Automation & Instrumentation Technology)
C. Shaw, Dipl.T., B.B.A.
S. Smolar, B.A., A.Sc.T.
J.N. Tompkin, B.Sc. (Eng.), P.Eng.,
E.A. Upward, Dipl.T., A.Sc.T.,
E. Wilmink, B.P.E., M.A., Coordinator - Cooperative Education

Advisory Committee: Electronic Engineering Technology

S. Atkinson, Operations Manager, Customer Service, Rogers Cable TV Ltd. (Chairman)
G. Aasen, Chief Operating Officer, PMC Sierra
D. Buchanan, Manager, Protection & Control, BC Hydro
B. Canavan, Manager, Research & Development, Dynapro Systems Inc.
S. Charlton, Simrad Mesotech
J. Coburn, Technical Specialist, Canadian Systems Maintenance
C. Evans, Creo Products Inc.
D. Greenwood, Supervisor, Instrument Module Repair, BC Hydro
D. Heywood, Program Manager, Radio & Satellite, MPR Teltech Ltd.
L. Metcalfe, President, Dynamic Control Systems
J. Muir, Application Engineer, Hallwood Agencies Ltd.
J. Nordgren, Manager, Test & Repair BC Tel
R. Sigurdson, Employment & Immigration Canada
W. Tracey, President, Systek Engineering
C. Wang, System Control Engineer, BC Hydro

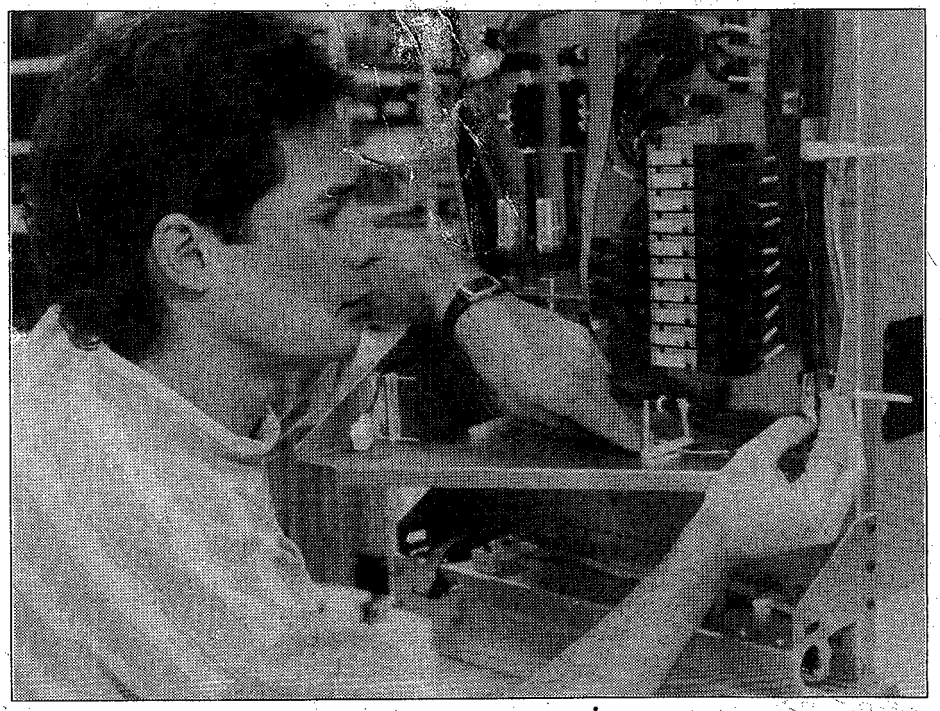
Advisory Committee: Automation & Instrumentation

G. Barron, Instrumentation & Communication Services, B.C. Gas
M. Cantor, Manager, Control Systems, Fransen Engineering
F. Gottardi, Keystone Yarway
P. Haigh, Instrument Dept. Manager Fletcher Challenge
B. Hindmarch, Ballard Power Systems
J. Kay, Principal, Process Automation Systems Inc. (Chairman)
D. Wall, Vice-President, Norpac Controls Ltd.
K. Wall, Instrument Dept. Manager, Hipp Engineering Ltd.
H. Welch Sandwell Inc.

ELECTRICAL & ELECTRONIC TECHNOLOGY

ELECTRICAL TRADES

ELECTRICITY AND INDUSTRIAL ELECTRONICS
Certificate Program



This program will provide graduates 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 the 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 and Sea Island campuses and is also offered in Langley and Maple Ridge. Applicants must specify location preference when applying.

Normal Course Hours
0800-1500, Monday through Friday.

Prerequisites
a. High school graduation or equivalent with C or better in Math 11 (Algebra); or
b. Pass an entrance test measuring math and reading skills.

BCIT currently has agreements with a number of school districts throughout the province that 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 counselor, Technical Education teacher, or call BCIT Student Services at (604) 434-3304, or toll-free 1-800-667-0676 for enquiries from outside the Greater Vancouver Area.

Instructors
Henry Braun
Gordon Denham
Ash Dutta
Joe Jordan
Dag Stenerud
Steve Wallis
Mike Wanstall, P.Eng., Chief Instructor

ELECTRICAL & ELECTRONIC TECHNOLOGY

ELECTRICAL CONTROL SERVICE TECHNICIAN
Diploma Program

This program will provide graduates with the theory and practical skills necessary to enter the service and maintenance sector of the electrical trade. Electrical service technicians test, repair and maintain electrical control equipment and systems in commercial and industrial applications.

Job Opportunities
The electrical trade is being heavily affected by high technology electronic equipment and devices. Challenging career opportunities in the service and maintenance sectors are increasing for electrical workers who possess higher levels of training in electronics. Graduates may also qualify for advanced standing as indentured candidates within the electrical apprenticeship system.

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 the 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

TELX	2301	AC, DC & Digital Circuits
TELX	2305	3 Phase & Power Circuits
TELX	2310	AC & DC Applications
TELX	2315	Wiring Methods & Blueprints
TELX	2330	Canadian Electrical Code
TELX	2325	Motor Control Theory & Devices

Level 2

TELX	3201	Electronic Motor Control
TELX	3205	Computers & PLC 1
TELX	3210	Programmable Controls
TELX	3215	Instrumentation & Position Controls
TELX	3220	Optoelectronics & Communications
TELX	3225	Control Applications

Prerequisites
Grade 12 graduation with English 12, Math 11 (C or better); Math 12 recommended. Graduation from a provincially approved Electronics Common Core program.

Length of Program
40 weeks.

Normal Course Hours
0800-1500 hours, Monday to Friday.

Instructors
Dave Stonoga
Mike Wanstall, P.Eng., 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 Trade Qualification Exam.

The Program
The Security Alarm Installer 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. 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.

The program is divided into two levels. A passing grade is required in each Level 1 course to progress to Level 2. Evaluation is based on both classroom theory and shop/practical performance.

Applicants should possess good health and physical mobility in order to meet the demands of the work. Good hand/eye coordination and communication skills in both verbal and written English are recommended. 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.

Continued on page 120

ELECTRICAL & ELECTRONIC TECHNOLOGY

Continued from page 119

Program Content

TELC 1100 Fundamentals of Electricity
TELC 1101 Fundamentals of Electronics
TELC 2200 Building Construction and Codes
TELC 2201 Cable and Device Installation
TELC 2202 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 February and September each year.

Normal Course Hours

0800-1500, Monday through Friday.

Prerequisites

a. Grade 12 graduation or equivalent with a C or better in Math 11 (Algebra), or pass an entrance test measuring math and reading skills.
b. Security clearance from the office of the B.C. Solicitor General will be required prior to final acceptance.

BCIT currently has agreements with a number of school districts throughout the province that 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 counselor, Technical Education teacher, or call BCIT Student Services at (604) 434-3304, or toll-free 1-800-667-0676 for inquiries from outside the Greater Vancouver area.

Instructors

Peter Burleigh
Mike Wanstall, P. Eng., Chief Instructor
Mike Zecchel

ELECTRONICS TECHNICIAN PROGRAMS

ELECTRONICS TECHNICIAN COMMON CORE

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, 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

The student must maintain a minimum 70% overall average in each level in order to proceed to the next level. Failure to do so could result in automatic withdrawal from the program.

Program Length

Two versions of the program are offered: 30 weeks full-time consisting of two 15-week terms beginning several times a year; and on a part-time evening basis, three nights a week, 3 1/2 hours per night over two years.

Program Locations

BCIT Burnaby, Sea Island 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

Full-time format:
0800-1500, Monday through Friday

Part-time format:
Tuesday, Wednesday, Thursday
1830-2200

Prerequisites

High School graduation with English 12 (or equivalent), 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

The following diploma programs are available to students who have successfully completed the Electronics Technician Common Core Program or equivalent.

- Aircraft Electronics (AME category E). Please refer to page 231.
- Automated Business Equipment Technician
- Electrical Control Service Technician Please refer to page 119.
- Industrial Instrumentation Service Technician Please refer to page 123.
- Telecommunications Technician
- Marine Electronics Service Technician

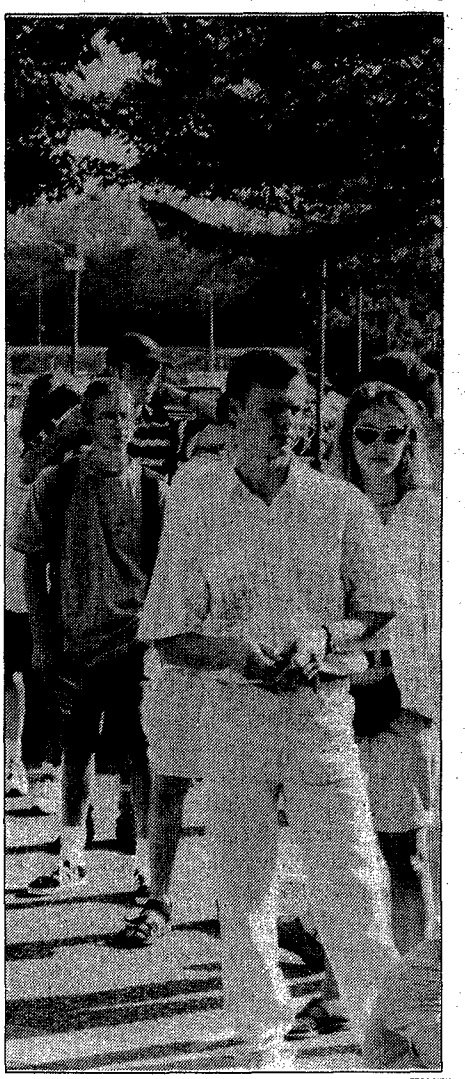
BCIT currently has agreements with a number of school districts throughout the province that give special status to Career Preparation graduates. A limited number of seats are available for Career Preparation graduates entering directly from secondary school. To gain preferential entry, students must meet the above prerequisites, complete a related Career Preparation Program, and have good grades in Electricity/Electronics and/or Math 11.

ELECTRICAL & ELECTRONIC TECHNOLOGY

For additional information see your high school counselor, Technical Education teacher, or call BCIT Student Services at (604) 434-3304, or toll-free 1-800-667-0676 for inquiries from outside the Greater Vancouver Area.

Instructors

Terry Knudson, Chief Instructor
Miro Angeles, P. Eng., M. Ed., Apprentice Instructor
Ed Bosman
Emile Gaudet
Lance McCollum
Bruce Van Groenigen
Len Worley
Tom Whitehouse
Canede Wong
Gabriel Yam



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 user point of view and will be 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. There are challenging career opportunities with firms dealing with modern business equipment and systems 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 the 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 that found in industry.

Program Content

Level 1 (19 weeks)

TELX 2226 Customer Relations 1
TELX 2228 Basic Mechanical and Safety
TELX 2230 Copier Operations
TELX 2232 Introduction to Microcomputers for Technicians

Level 2 (12 weeks)

TELX 3316 Basic Xerography
TELX 3318 Software Applications
TELX 3320 Printer Operations and Interfacing
TELX 3322 Customer Relations 2
TELX 3324 Shop Skills

Level 3 (19 weeks)

TELX 4422 Work Experience
TELX 4424 Analogue Copier Systems
TELX 4426 Digital Copiers/Printers
TELX 4428 Colour Copiers/Printers
TELX 4430 Data Communications
TELX 4432 Microcomputer Repair

Prerequisite

Grade 12 graduation with English 12, Math 11 (C or better); Math 12 recommended. Graduation from a provincially approved Electronics Common Core program.

Length of Program

40 weeks full-time beginning in September each year.

Normal Course Hours

0800-1500, Monday through Friday.

Instructors

Terry Knudson, Chief Instructor
Sherry McCarnan
Patrick Mulldoon
James Penty
Len Worley

Program Advisory Committee Members:

Robert Custus, Panasonic Office Automation
Jeff Davis, Verster Office Systems Ltd.
Peter Eksyma, Logic Computer Services Ltd.
Gordon Horne, Automation One
Steve Ilott, Benndorf-Verster
Brian McLaurin, Minolta Business Equipment
Earl Richardet, Prime Copy Office Systems Ltd.
Rob Singer, Murphy's Office Automation
Brian White, IBM Canada Ltd.

ELECTRICAL & ELECTRONIC TECHNOLOGY

MARINE ELECTRONICS SERVICE TECHNICIAN
Trades Diploma Program

This program builds on the foundation of generic technical skills developed in the Electronics Technician Common Core Program.

The program covers the application of electronics in marine telecommunications, navigational aids and electrical and control systems.

Job Opportunities
Graduates would have the option of working in a variety of sectors within the marine electronics field. These include sales and service and the installation and maintenance of marine electronic equipment.

Program Content
(subject to change)

Level 1

TELX 2211	Telecommunication Principles
TELX 2213	Radio Frequency Communications
TELX 2215	Radio Frequency Transmission Systems
TELX 2217	Multiplex Systems
TELX 2229	Technical Report Writing

Level 2

TELX 3313	High Reliability Soldering
TELX 3317	Computer Operating Systems
TELX 3327	Ship Knowledge
TELX 3329	Marine Safety and Regulations
TELX 3331	Marine Electrical Systems
TELX 3333	Marine Electronic Control Systems
TELX 3335	Microwave Systems

Level 3

TELX 4413	Data Communications
TELX 4415	Customer Relations
TELX 4417	Digital Networks
TELX 4427	Radar and Electronics Navigational Aids
TELX 4429	Marine Communication Systems

The student must maintain a minimum of 70% overall average in the theory portion and a minimum 70% overall average in the laboratory portion of each level in order to proceed to the next level.

Program Length
40 weeks full-time beginning in January 1996.

Normal Course Hours
0800-1500, Monday through Friday.

Prerequisites
Grade 12 graduation with English 12, Math 11 (C or better); Math 12 recommended. Graduation from a provincially approved Electronics Common Core program.

Instructor
Terry Knudson, Chief Instructor
K.C. Yam

TELECOMMUNICATIONS TECHNICIAN
Diploma Program

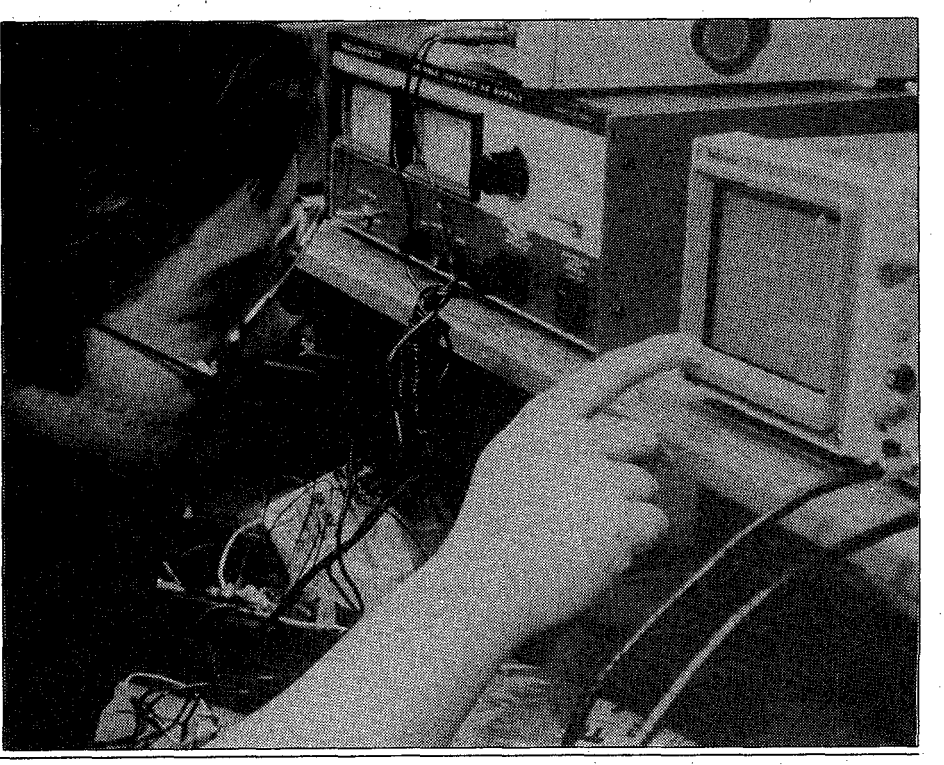
This program builds on the foundation of generic technical skills developed in the Electronics Technician Common Core Program.

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, RF communications and pager companies and government departments.

Program Content
Level 1

TELX 2211	Telecom Principles
TELX 2213	RF Communications
TELX 2215	RF Transmission Systems
TELX 2217	Multiplex Systems
TELX 2219	Microwave Systems



Level 2

TELX 3311 Fibre Optics
TELX 3313 High Reliability Soldering
TELX 3315 Voice Cabling
TELX 3317 Computer Operating Systems
TELX 3319 Data Cabling

Level 3

TELX 4411 Telephone Communications
TELX 4413 Data Communications
TELX 4415 Customer Relations
TELX 4417 Digital Networks
TELX 4419 Cable Distribution Systems
TELX 4421 Satellite Systems

Total training time for the Telecommunications Technician program is 1200 hours over 40 weeks.

Each of these three levels consist of essential theory knowledge combined with practical technical skills.

The student must maintain a minimum of 70% overall average in the theory portion and a minimum of 70% overall average in the laboratory portion of each level in order to proceed to the next level.

Program Length
40 weeks full-time beginning in September each year.

Normal Course Hours
0800-1500, Monday through Friday.

Prerequisite
Grade 12 graduation with English 12, Math 11 (C or better); Math 12 recommended. Graduation from a provincially approved Electronics Common Core program.

Instructors
Ken Cobler
Terry Knudson, B.Ed., Dip. T., T.Q., Chief Instructor
Greg Lambrecht, A.M.E., I.D.
Steve Mann

INDUSTRIAL INSTRUMENTATION

INDUSTRIAL INSTRUMENTATION SERVICE TECHNICIAN
Diploma Program

The industrial instrumentation service technician will apply, install, repair, calibrate, and tune measurement and control instruments applied to the industrial manufacturing processes. Students will learn computerized control, programmable logic controllers, and microprocessor instrumentation. These are essential job skills for continued future employment in instrumentation.

Job Opportunities
This program will open new career opportunities for electronics core graduates, as well as address the requirements of the industrial instrumentation industry for skilled and qualified control technicians. Graduates will meet the needs of instrument service and sales companies, the heating and ventilating field, environmental and pollution control work, and will be ready to enter employment in a variety of manufacturing processes such as food processing, manufacturing, oil refining, mining and pulp and paper industries.

The Program
The Industrial Instrumentation Service Technician program stresses practical, hands-on experience to complement theory. This program will appeal to persons who enjoy mechanical work, as it utilizes the student's electronic knowledge in industrial instrumentation applications.

The program is divided into two levels. Successful completion of the first level will be required before continuing to the second level. Applicants should possess good health and the physical condition necessary to meet the demands of the work: good hearing, eyesight and hand/eye coordination.

Program Content
Level 1

TELX 2101 Process Management
TELX 2105 Introduction to Process Control
TELX 2110 Pneumatic Instrumentation
TELX 2115 Electronic Instrumentation
TELX 2120 Instrumentation Computer Skills

Level 2

TELX 3101 Process Control
TELX 3105 Microprocessor Instrumentation
TELX 3110 Programmable Logic Controllers
TELX 3115 Heating, Ventilating, and Air Conditioning
TELX 3120 Computer Control Systems

Prerequisite
Grade 12 graduation with English 12, Math 11 (C or better); Math 12 recommended. Graduation from a provincially approved Electronics Common Core program.

Length of Program
40 weeks — two 20-week terms with a two-week break at midterm, beginning in January of each year.

Normal Course Hours
0800-1500 hours, Monday to Friday

Instructors
R. Evans, Chief Instructor
R. Wagner


1000
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ENGINEERING

SCHOOL OF ENGINEERING

ENGINEERING

ADMINISTRATION

Office of the Dean

D.K.N. Chowdhury, B.Sc. (Hons.), D.I.C., M.A., M.B.A., Ph.D., Dean
Doug Deans, B.A., Acting Dean
Terry Suen, Administrative Officer
Shameem Hameer, Administrative Assistant
Biological Sciences
  Biotechnology
  Food Sciences

Civil Technologies

Tony Barren, B.Sc., Ph.D., P.Eng., Acting Associate Dean
Building
Civil and Structural
Geographic Information Systems
Geomatics

Mechanical Design and Manufacturing Technologies

Trevor Williams, B.Sc., M.Sc. (Mech. Eng.), P.Eng., Associate Dean
Mechanical Engineering Technology
  CAD/CAM
  Mechanical Design
  Mechanical Manufacturing
  Mechanical Systems
Plastics
Robotics and Automation
Industrial Education (Technology Education)
  Teacher Education (IETE)

Process Technologies

Keith Errington, B.C.L.S., Acting Associate Dean
Chemical Sciences
Mining
Nondestructive Testing
Petroleum and Natural Gas
Quality Assurance and Nondestructive Testing
Wood Products Manufacturing

Renewable Resources Technology

Keith Errington, B.C.L.S., Acting Associate Dean
Fish, Wildlife and Recreation
Forestry

For Information Sessions held throughout the year, contact Student Services at (604) 434-3304.

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.

Biotechnology
Food Technology

BIOTECHNOLOGY

Diploma Program

Biotechnology, an important and challenging new technology, makes use of such modern tools of biology such as gene splicing, protein engineering and cell culture.

The Program

The Biotechnology program is designed to provide students with current, state-of-the-art training. This includes practical training in the skills and techniques of biotechnology, and an overview of the current state of knowledge in all the major academic disciplines to which biotechnology is applied. An experimental approach to learning is used to integrate lecture and laboratory material. In addition, students participate in an industry-sponsored internship during the final term of study in the program.

Job Opportunities

Biotechnology graduates will be employed by biological research laboratories, bio-pharmaceutical companies, analytical labs and biological production facilities.

Graduates are employed as scientific research technicians by B.C. Research Inc., Helix Biotechnology, Quadra Logic Technologies, ID Biomedical and various UBC departments and affiliated research institutes. As lab technicians graduates perform biochemical/microbiological testing for employers such as EVS Environmental, GVRD and Mitroflow International. As production technicians graduates might be employed by companies such as Citex Laboratories or the UBC Biotechnology Lab. Beginning salaries range from $25,000 to $30,000 per annum.

Program Length

Two years, full-time beginning in September each year.

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

English 12 (C+), Math 12 (C), Biology 12 (C), Chemistry 11 (C) and Physics 11 (C).

Program: BIOTECHNOLOGY

Level 1 (15 weeks)			hrs/wk	credits
BIOT	1310	Introduction to Biotechnology	4.0	4.0
BIOT	1350	Biology 1	4.0	4.0
BIOT	1370	Lab Safety	2.0	2.0
CHEM	1103	Applied Chemistry (inorganic)	6.0	6.0
COMM	1144	Communication 1 for Biotechnology	3.0	
MATH	1441	Basic Technical Mathematics	6.0	6.0
OPMT	1243	Introduction to Computers (MS-Works)	2.0	2.0
PHYS	1141	Physics	5.0	5.0

Level 2 (20 weeks)				
BIOT	2301	Microbiology for Biotechnology 1	6.0	8.0
BIOT	2350	Biology 2	4.0	5.5
CHEM	2203	Applied Chemistry (organic)	6.0	8.0
COMM	2244	Communication 2 for Biotechnology	3.0	
MATH	2441	Statistics	5.0	6.5
PHYS	2141	Physics	5.0	6.5

Level 3 (15 weeks)				
BIOT	3301	Microbiology for Biotechnology 2	6.0	6.0
BIOT	3320	Molecular Genetics 1	6.0	6.0
BIOT	3330	Plant Cell Biology	6.0	6.0
BIOT	3340	Biochemistry 1	6.0	6.0
CHEM	3311	Instrumental Analysis	5.0	5.0
COMM	3344	Communication 3 for Biotechnology	1.0	

Level 4 (15 weeks)			hrs/wk	credits
BIOT	4301	Advanced Microbiology	4.0	4.0
BIOT	4320	Molecular Genetics 2	6.0	6.0
BIOT	4330	Animal Cell Biology	6.0	6.0
BIOT	4340	Biochemistry 2	6.0	6.0
BIOT	4360	Process Systems	6.0	6.0
BIOT	4370	Management and Regulatory Affairs (7 weeks)	2.0	1.0
COMM	4444	Advanced Communication for Biotechnology	2.0	

Internship (5 weeks)				
BIOT	4380	Internship Project	30.0	6.0

Course Descriptions

BIOT 1310 (BISC 131) Introductory Biotechnology — presents a survey of the component technologies that make up biotechnology, and their application in science and industry. This course also looks at the ethical implications of this technology. Technologies covered include fermentation, single cell protein, genetic engineering, monoclonal antibodies, cell culture and enzyme technology. Applications covered include: human health, forestry, agriculture and waste management.

BIOT 1350 Biology 1 — Presents 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.

BIOT 1370 Lab Safety — Examines the principles of laboratory safety for handling chemicals, biological materials, and radioisotopes. Regulatory requirements and the regulatory agents responsible for general laboratory safety, chemical biological and radiation safety will be described.

BIOT 2301 Microbiology for Biotechnology 1 — Introduces microbiology to the student by examining the history, scope and relevance of the field. Microbial structure, nutrition, growth and metabolism is discussed. The control of microorganisms and antimicrobial chemotherapy are discussed. Metabolism, nucleic acid synthesis, protein synthesis and regulation of enzyme activity are examined. Techniques employed in enumeration and characterization of microorganisms are performed. Procedures that distinguish between the major microbial groups are performed.

BIOT 2350 Biology 2 — Presents 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. Prerequisite: BIOT 1350.

BIOT 3301 Microbiology for Biotechnology 2 — Discusses microbial genetics, recombination, plasmids and recombinant DNA techniques. Eucaryotic and procaryotic viruses are described. Major groups of microorganisms are surveyed. The role of microorganism in the environment, industrial microbiology and biotechnology is described. Procedures used in the identification of microorganisms, the evaluation of antimicrobial activity, the growth and quantification of phage, and detection of mutagens and carcinogens using a microbial system are employed. Prerequisite: BIOT 2301.

BIOT 3320 (BISC 322) Molecular Genetics 1 — Introduces genetic analysis viewed from the molecular level. Topics include: Mendel's Laws, chromosome mapping, gene mutation, DNA structure, DNA function, as well as the genetic basis for recombinant DNA technology. Prerequisites: BIOT 2350, BIOT 2301.

BIOT 3330 (BISC 333) Plant Cell Biology — Covers vascular plant functions and structures, general aspects of plant physiology and tissue culture techniques used in the plant biotechnology field. Prerequisite: BIOT 2350.

BIOT 3340 (BISC 334) Biochemistry 1 — Looks at the structure and properties of proteins and carbohydrates, as well as their function in living cells. Principles learned will be applied to problems in the laboratory. Prerequisite: CHEM 2203.

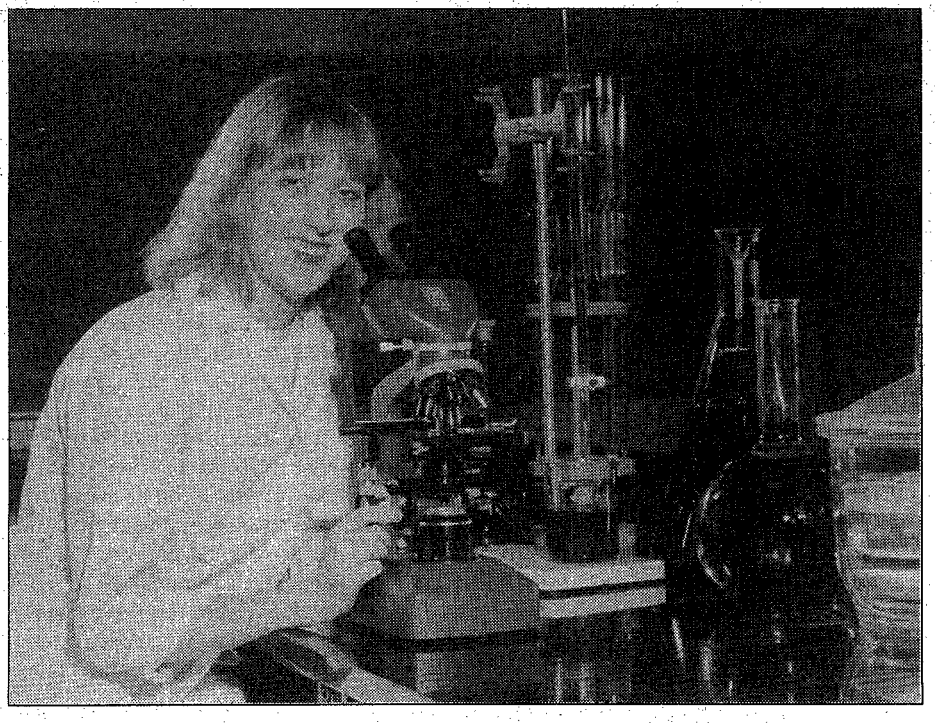
BIOT 4301 Advanced Microbiology — Provides an overview of the mammalian immune system and how it works, including humoral immunity, the complement system and cell-mediated immunity. Students also receive training in some of the techniques of immunology, such as immunization of animals, determination of antibody titre and the production of monoclonal antibodies. Industrial Microbiology will be discussed with reference to the ways microorganism are grown to achieve the production of commercial products. Viruses will be discussed with reference to structure and reproductive strategies. Techniques employed in industrial microbiology and virology will be performed. Prerequisites: BIOT 3301.

BIOT 4320 (BISC 432) Molecular Genetics 2 — Continues from Molecular Genetics 1 in its coverage of the principles of genetic analysis. Topics include recombinant DNA technology, chromosome structure/function, the regulation of gene expression, mutation, recombination, transposable elements and extranuclear DNA. This course also covers advanced topics in Molecular Genetics, such as the applications of Molecular Genetics cancer biology. Prerequisite: BIOT 3320.

BIOT 4330 (BISC 433) Animal Cell Biology — Examines the inner workings of the animal cell and the application of this knowledge in biotechnology. Prerequisite: BIOT 3320.

BIOT 4340 (BISC 434) Biochemistry 2 — Discusses the generation of metabolic energy through an examination of the central pathways involved in the oxidation of fuel molecules. The biosynthesis of macromolecular precursors is examined. The process of photosynthesis and its role in providing biological systems with free energy is analyzed. Methods used for the isolation, purification and analysis of simple and complex biopolymers will be studied. Prerequisite: BIOT 3340.

ENGINEERING



BIOT 4360 (BISC 436) Process Systems for Biotechnology — Presents a study of Fermenter design and operation. Instrumentation required for biological processes is discussed. Waste treatment systems are presented with examples taken from biotechnology. Various methods of downstream processing of fermentation broths are assessed. Economics of fermentation and downstream processing are analyzed.

BIOT 4370 Management and Regulatory Affairs for Biotechnologists — Teaches the biotechnology student skills that will assist in the management of a biotechnology facility. The importance of Total Quality Management together with Good Manufacturing Practices and Good Laboratory Practices will be emphasized. The student will be shown how to develop a quality management system based on ISO 9000 standards. Government regulations will be discussed. Management practices appropriate for a biotechnology facility will be taught.

BIOT 4380 (BISC 438) Internship Practicum — Allows students to select and carry out a project 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. Students are given a five week period to work full-time on their project during weeks 8-15 of their final term of study. Students must also prepare a formal report on the outcome of their project.

CHEM 1103 (CHEM 103) Chemistry 1 for Biological Sciences —Introduces 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 — Introduces organic chemistry course with specific topics related to biotechnology and food technology. Topics include carbohydrates, lipids, proteins, solvents. Isomerism of selected organic compounds is discussed. Laboratory exercises consist of quantitative, qualitative analysis and separation of organic compounds. Prerequisite: CHEM 1103.

CHEM 3311 Analytical Methods — Presents instrumentation used for chemical analysis for food and biological materials. The theory, construction, application and operation of instrumentation is discussed. Instruments include: spectrophotometry (visible, UV, IR, emission, absorption), flame photometry and chromatography (gas, liquid, high pressure liquid). Laboratory exercises involve the use of these instruments. Prerequisite: CHEM 2203.

COMM 1144 Communication 1 for Biotechnology — Teaches students practical writing, speaking and presentation techniques, and the correct formats for short reports, instructions and lab reports.

COMM 2244 Communication 2 for Biotechnology — Enables students to put together a career package, take part in a meeting and to give a persuasive oral presentation in front of a panel.

COMM 3344 Communication 3 for Biotechnology — Provides a scheduled time slot where a Communication Instructor is available to provide guidance and assistance to Biotechnology students on writing assignments assigned in other courses.

COMM 4444 Advanced Communication for Biotechnology — Teaches students how to do up-to-the-minute research in biotechnology, critically analyze the results of that research and present the results in a seminar.

MATH 1441 (MATH 144) Basic Technical Mathematics — Covers 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. NOTE: Supplementary content under development.

MATH 2441 (MATH 244) Statistics for Biological Sciences — Covers organization and graphic 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 test. Prerequisite: MATH 1441.

OPMT 1243 (OPMT 243) Introduction to Computing — Provides students with basic skills in: word-processing, spreadsheets and databases. Additional topics include exchanging and integrating information between various parts of the software system and solving complex mathematical problems using the computer.

PHYS 1141 Physics: Chemical Sciences/ Biotechnology 1 — Covers a wide range of physical principles, relevant 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 2141 Physics: Chemical Sciences/ Biotechnology 2 — Covers 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 1141.

Faculty and Staff

Doug Deans, B.A., Acting Dean
P. Barran, B.Sc., M.Sc., Ph.D., R.P.Biol., Program Head, Biotechnology
M. Englouen, Dipl.T.
R. Hargreaves, Dipl.T., A.Sc.T.
J. Nichols, B.Sc., M.Sc., Ph.D., R.P.Biol.
V. Martens, B.S.A., M.Sc., P.Ag.
K.Turner, B.Sc., M.Sc., P.Ag.

Advisory Committee Members: Biotechnology

C. Breuil, UBC Forest Products Biotechnology
G. Hunter, B.C. Biotechnology Alliance
B. Kelly, Zenon Environmental
D. Kilburn, UBC Biotechnology Lab
P. Logan, BioLoma Consulting (Chair)
R. Martin, Agriculture Canada
A. Matheson, Uvic Biochemistry and Microbiology
R. McMaster, UBC Medical Genetics
R. Schmid, Helix Biotechnology
D. Shindler, Canadian Genetic Diseases Network
H. Ziltener, UBC Biomedical Research Centre

BUILDING TECHNOLOGY
Diploma Program

Spiralling advances in technology have increased the public's expectation of their communities and the buildings constructed in them. Buildings are expected to be designed and constructed to rigorous standards of workmanship and safety while at the same time incorporating all the features that contribute to speed of erection, financial efficiency and user satisfaction. 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 production personnel, job captains, specification writers, estimators, project coordinators and managers, building inspectors, quantity surveyors, developers, officials in property management departments, appraisers and assessors, technologists with builders/developers, 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 students a sound preparation for rewarding careers in many areas of the construction industry.

All students follow a common two-year program that includes lectures, computer applications, drafting room practice and field trips. In the second-year (subject to departmental approval) students may choose from one of three areas of specialization:

Architectural — primarily intended for those students who plan to work in architectural offices, offer design services, or pursue an architectural degree.

Building Science — primarily intended for those students who plan to embark on careers in durable building construction, building problem diagnosis, off-site assemblies, new materials manufacture and environmental challenges in creating the built environment.

Economics-Construction Operations — primarily intended for those students who plan to follow careers in construction, quantity surveying, development 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.

Students participate in an industry-sponsored project (practicum or directed studies) in the second year of the program in each of the options.

The industry project is an integral program component, that is required for completion and certification. Students may be required to participate in work experience activities at the industry sponsor's regular place of business.

Program Length

Two years, full-time beginning in September each year.

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.

ENGINEERING

Accreditation

The Building Technology diploma program is accredited by the Applied Science Technologists and Technicians of British Columbia as a Technologist (ASTTBC) program. Full-time students may apply for student membership in ASTTBC. Graduates are eligible for Graduate Technologist membership and may apply for registration as an Applied Science Technologist after completing a minimum of two years of relevant experience.

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 academic experience, or construction industry experience. Resume required for minimum requirements.

BUILDING TECHNOLOGY
First-year

Level 1 (15 weeks)

			hrs/wk	credits
BLDG	1000	Building Drafting	3.0	3.0
BLDG	1050	Construction Site Processes	3.0	3.0
BLDG	1200	Building Construction 1	6.0	6.0
BLDG	1400	Introduction to Computers	3.0	3.0
CIVL	1200	Building Structures 1	3.0	3.0
COMM	1140	Technical Communication for Building	3.0	3.0
MATH	1401	Basic Technical Mathematics for Building	5.0	5.0
PHYS	1140	Applied Physics for Building 1	4.0	4.0

Level 2 (Term 2A 10 weeks)

			hrs/wk	credits
BLDG	2000	Planning	2.0	3.5
BLDG	2200	Building Construction 2	6.0	8.0
BLDG	2250	Construction Contracts 1*	2.0	1.5
BLDG	2400	CADD for Building*	3.0	2.0
CIVL	2201	Building Structures 2	3.0	4.0
COMM	2240	Technical Communication for Building*	3.0	2.0
MATH	2401	Calculus and Analytic Geometry for Building	5.0	6.5
OPMT	1185	Project Management*	2.0	1.5
PHYS	2140	Applied Physics for Building 2	4.0	5.5

Level 2 (Term 2B 10 weeks)

			hrs/wk	credits
BLDG	2000	Planning 2	3.0	3.5
BLDG	2200	Building Construction 2	6.0	8.0
BLDG	2300	Construction Estimating 1*	4.0	2.5
BLDG	2405	CADD Applications for Building*	3.0	2.0
CIVL	2201	Building Structures 2	3.0	4.0
COMM	2254	Technical Communication for Building*	2.0	1.5
MATH	2401	Calculus and Analytic Geometry for Building	5.0	6.5
PHYS	2140	Physics for Building	4.0	5.5

Level 3 (15 weeks)

			hrs/wk	credits
BLDG	3200	Building Construction 3	6.0	6.0
BLDG	3250	Construction Contracts 2	2.0	2.0
BLDG	3300	Construction Estimating 2	4.0	4.0
BLDG	3500	Codes and Regulations	2.0	2.0
CIVL	3202	Building Structures 3	3.0	3.0
ELEX	1810	Electrical Systems	3.0	3.0
MSYS	3880	Heating/Ventilating /Air Conditioning	4.0	4.0

Options

			hrs/wk	credits
BLDG	3000	Architectural Option 1	6.0	6.0
BLDG	3050	Economics - Construction Operations Option 1	6.0	6.0
BLDG	3100	Building Science Option 1	6.0	6.0

Level 4 (Term 4A 10 weeks)
Core Courses

			hrs/wk	credits
BLDG	4200	Building Construction 4	6.0	8.0
BLDG	4300	Construction Estimating 3	4.0	5.5
BLDG	4350	Construction Specifications	2.0	2.5
BLDG	4400	Construction Management (Econ.)*	3.0	2.0
BLDG	4505	Building Acoustics*	2.0	1.5
CIVL	4203	Building Structures 4 (Architectural)*	3.0	2.0
ELEX	2805	Illumination*	2.0	1.5
MSYS	3980	Plumbing Systems*	2.0	1.5
OPMT	1260	Management Engineering 1 for Building*	3.0	2.0

Options

			hrs/wk	credits
BLDG	4000	Architectural Option 2	6.0	10.5
BLDG	4050	Economics - Construction Operations Option 2	6.0	10.5
BLDG	4100	Building Science Option 2	6.0	10.5

Level 4 (Term 4B 10 weeks)
Core Courses

			hrs/wk	credits
BLDG	4200	Building Construction 4	6.0	8.0
BLDG	4300	Construction Estimating 3	4.0	5.5
BLDG	4350	Construction Specifications	2.0	2.5
BLDG	4400	Construction Management (Arch.) (Bldg. Sc.)*	3.0	2.0
SURV	1120	Survey for Building*	3.0	2.0

Options	hrs/wk	credits
BLDG 4000 Architectural Option 2	10.0	10.5
BLDG 4050 Economics - Construction Operations Option 2	10.0	10.5
BLDG 4100 Building Science Option 2	10.0	10.5

*denotes half-term courses

Course Descriptions

BLDG 1000 (BLDG 101) Building Drafting — Covers 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 — Covers job site management and planning, implementation and control of site construction processes; contractual relationships, site management, on site control systems, job site safety and the role of the WCB, material procurement, scheduling fundamentals, and an introduction to computer scheduling.

BLDG 1200 (BLDG 102) Building Construction 1 — Covers fundamentals of building construction in terms of material selection and detail assembly for housing projects. Examination of typical systems of wood and concrete construction for the purpose of preparing working drawings. Emphasis on part 9 of the B.C. Building Code. Possible guest speakers and field trips.

BLDG 1400 (BLDG 125) Introduction to Computers — Presents 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 — Covers fundamentals of functional building design, external and internal. Topics include impact of site slope, topography, daylight orientation, vehicular constraints and function, internal functions such as circulation, kitchen and washroom design, space planning and room geometry, privacy concerns internal and external, zoning bylaws interpretations and other planning issues. Prerequisite: BLDG 1000.

BLDG 2200 (BLDG 202) Building Construction 2 — Continues from BLDG 1200. Prerequisite: BLDG 1200.

BLDG 2250 (BLDG 105) Construction Contracts 1 — Covers the 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 — Introduces 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; discussion of computer applications for estimating. Prerequisite: BLDG 1200.

BLDG 2400 (BLDG 209) CADD for Building — Presents microcomputer-based CADD using AutoCAD software (latest version). 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 — Covers CAD applications 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 — Presents a 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 - Construction Operations Option 1 — Covers economic factors effecting the construction industry, principles of land development, rights and limitations of land ownership, valuation techniques of real property, cost control and planning, elemental analysis, cash flow analysis feasibility analysis of land development. Prerequisite: Completion of first-year program.

BLDG 3100 Building Science Option 1 — Covers principles of investigating the effects of air, moisture, wind etc. on the building envelope; techniques of quantifying performance levels of building components through use of computer modeling; the application of this course extends from design to erection to post construction work such as building management, diagnosis and remediation. This course includes field trips. Prerequisite: Successful completion of first-year program.

BLDG 3200 (BLDG 302) Building Construction 3 — Continues from 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 3250 (BLDG 304) Construction Contracts 2 — Continues from 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 3300 (BLDG 306) Construction Estimating 2 — Continues from BLDG 3300. More detailed study and application of measurement and pricing of work of specific trades with emphasis on the building, concrete structure and related trades. Examination of CIQS Methods of Measurement of Construction Work. Prerequisite: BLDG 2300.

BLDG 3500 (BLDG 313) Codes and Regulations — Building Law in Canada. Presents 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 Projects —Continues from BLDG 3000. Covers graphics and freehand drawing of architectural subject matter; advanced design projects/problems; architectural model making; extensive seminar discussion; possible guest lecturers and field trips. Course includes architectural office practicum and comprehensive final student project. Prerequisite: BLDG 3000.

BLDG 4050 (BLDG 416) Economics - Construction Operations Option 2 — Continues from BLDG 3050 - a study of project management principles within a construction setting. Topics include financial management, construction financing, cost accounting, project tracking, schedule analysis, project control methods and reporting systems, risk management, current labour environment within the construction industry, construction claims and quality assurance programs. The course includes preparation and presentation of construction proposals and feasibility reports as well as an industry practicum. Prerequisite: BLDG 3050.

BLDG 4100 Building Science Option 2 — Continues from BLDG 3100. Covers application of basics taught in part-one plus working with current standards which govern building envelope components; in depth study of cladding systems, membranes, interface details as well as indoor air quality. Diagnostic skills are taught and applied to retrofit and building management work. The course includes a number of field trips and an industry practicum. Prerequisite: BLDG 3100.

BLDG 4200 (BLDG 402) Building Construction 4 — Continues from BLDG 3200. Prerequisite: BLDG 3200.

BLDG 4300 (BLDG 406) Construction Estimating 3 — Continues from BLDG 3300. Covers 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 and bid procedures in general. Prerequisite: BLDG 3300.

BLDG 4350 (BLDG 305/405) Construction Specifications — Presents the 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, 3250.

BLDG 4400 (BLDG 411) (MATH 440) Construction Management/Computer Spreadsheets — Presents practical computer applications with an emphasis on economic problems associated with large comprehensive housing projects, high-rise construction, and other large construction projects. Topics include construction estimating, construction cash flow and project cash flow. Prerequisite: BLDG 1050, 1400, 2300, 3300.

BLDG 4505 (BLDG 419) Building Acoustics — Covers 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 — Covers 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 — 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, catalogues 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 — Covers 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.

ENGINEERING

COMM 1140 (TCOM 102) Technical Communication 1 for Building — Teaches students 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 2 for Building — Teaches students 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 2254 (TCOM 301) Advanced Technical Communication 3 for Building — Concentrates on two problems of particular relevance to building 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 1810 (ELEC 250) Electrical Systems — Teaches students 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; and how to recognize and avoid building designs that create costly electrical design problems. Prerequisite: PHYS 2140.

ELEX 2805 (ELEC 150) Illumination — Deals with the types and characteristics of lighting sources; quantity and quality of light; lighting units, terminology and calculations. Prerequisite: ELEX 1810.

MATH 1401 (MATH 140) Basic Technical Mathematics for Building — Covers radian measure; trigonometric functions, solution of triangles, and vectors; 3D trigonometry; irregular areas and volumes; exponentials and logarithm, decibel scale and financial mathematics related to building technology.

MATH 2401 (MATH 240) Calculus and Analytic Geometry for Building — Covers 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. Prerequisite: MATH 1401.

MSYS 3880 (MSYS 305) Heating Ventilating and Air Conditioning — Introduces the factors and concerns influencing indoor comfort and heat transfer in buildings, properties of air and air conditioning processes. Application of these principles will be applied to preparing load estimates for a small building of a non-specialized nature. Review of building zoning, heat energy sources, solar radiation and applications of mechanical systems with descriptions of function and operation of components.

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 — Introduces 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 for Building— 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 —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 —Designed to meet the specific needs of the Building Technology. There is a lab component that 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) Surveying for Building — Introduces 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 and how to use the plane table.

Faculty and Staff

Tony Barren, B.Sc., Ph.D., P.Eng., Acting Associate Dean
F. Alfeld, Dipl.Eng., Instructor
M. Connelly, B.Sc., B.E.D.S., M. Arch., M.A.I.B.C., Assistant Instructor
M. Elling, B.Econ., Instructor
M. Gevers, B.Sc., B.A.Sc. (Civil Engineering), P. Eng., Instructor
R. Guerin, A.Sc.T., Instructor
D. Hale, Dipl.T., Assistant Instructor
W. Hand, B.A.Sc., P.Eng., M.B.A. Instructor
J. Klipa, B.A.Sc., P.Eng., Instructor
M. Kuzych, B. Sc., B. Ed., B.Arch., M.R.A.I.C., M.A.I.B.C., Instructor
A. Maharajh, B.A., Dipl.T., A.Sc.T., P.Q.S., Part-time Studies Coordinator, Assistant Instructor
M. Tanaka, B.A., B.Arch., M.R.A.I.C., M.A.I.B.C., Instructor
D. Yablonski, Dipl.T., A.Sc.T., Assistant Instructor

Advisory Committee Members: Building Technology

K. Chandok, 401 West Georgia Management Ltd.
D. Dalzell, Keith Panel Systems
T. Hamilton, E.W. Hamilton Ltd.
J. Hiebert, Task Construction Management Inc.
D. James, David H. James Ltd.
G. Johnson, B.C. Building Corporation
R. Letkeman, Ray Letkeman Architect, Inc.
D. McComb, Cascadia Land Corporation
N. McNeill, BC Hydro
E. Stregger, Costex Management Inc., Chair
K. Wickham, Barclay Construction Ltd.

CAD PROGRAMMING

Post-diploma Program

Computer Aided Design (CAD) techniques are becoming common engineering tools in industry and specialized training is required to effectively use and manage the technology. The objective of the Post-diploma program in CAD Programming is to develop a skill set that will allow engineers and technologists to take full advantage of this technology.

The CAD Programming Post-diploma program is a flexible program of studies that is available either as a one-year full-time program or as a part-time evening program.

Job Opportunities

Graduates of the program work in a diverse area of engineering including drafting/designing, CAD system management, software development and manufacturing automation. Students have started their own consulting and service companies or have moved into technical sales and training.

Prerequisites

A National Diploma of Technology (or equivalent) in a relevant engineering discipline (mechanical, civil, structural, building, mining, geology, electronics, etc.) or an engineering degree. Students must meet BCIT's English language requirement.

Applicants should have a basic knowledge of personal computers including DOS and should enjoy working with computers and learning new software.

Program Requirements

The general requirement for a Post-diploma is the completion of a minimum of 50 credits from the following components:

Components	Minimum credits
Management Subjects	6.0
Core and Specialty Technology Subjects	35.0
Graduation Project	6.0

This program is in the process of continuous improvement; therefore, the actual courses may vary from those shown.

Program: CAD PROGRAMMING (FULL-TIME)

Level 1 (September - December) (15 weeks)

		hrs/wk	credits
AICO 1070	Introduction to UNIX*	3.0	2.0
CDCM 2370	Program Design in C	3.0	3.0
CDCM 2372	Database Systems	3.0	3.0
CDCM 3375	CAD Customization 1	4.0	4.0
CDCM 3500	CAD Graphics (AutoCAD)	6.0	6.0
CDCM 3505	CAD Graphics (Microstation)	3.0	3.0
OPMT 3560	System Analysis	3.0	3.0

Level 2 (January - May) (20 weeks)

AICO 2070	Introduction to UNIX Shell Script Programming (Term A)*	3.0	2.0
CDCM 3470	Data Structures in C (Term A)*	4.0	2.5
CDCM 3472	CAD/Database Applications (Term B)*	3.0	2.0
CDCM 4470	File Processing in C (Term B)*	4.0	2.5
CDCM 4475	CAD Customization 2 (Term A)*	3.0	2.0
CDCM 4600	Advanced CAD Graphics	4.0	5.5
CDCM 4675	CAD Customization — Microstation (Term B)*	2.0	2.5
CDCM 4690	Post Diploma Project	5.0	6.5
CDCM 5660	Graphic System Management (Term A)*	3.0	2.0
CDCM 6660	Graphics Information Management (Term B)*	3.0	2.0
COMP 3765	Issues in Networking (Term A)*	3.0	2.0
COMP 4575	Graphics Programming (Term B)*	2.0	3.0

*denotes half-term courses

Course Descriptions

AICO 1070 Introduction to UNIX — Includes elementary UNIX commands, files and directory structures, the VI editor, piping, and shell script programming with Bourne or C shells. Taught on workstations using a hybrid SYSTEM V/BSD UNIX.

AICO 2070 Introduction to UNIX Shell Script Programming — Covers basic shell script programming based on the Bourne and C shell. Includes control structures, shell variables and commands, as well as the user shell environment. The kernel and its relationship to the shell is introduced. Prerequisite: AICO 1070.

CDCM 2370 Program Design in C — Introduces modern programming practices with emphasis on structured programming, modularization, and the top-down approach to problem solving. C is used as the language for illustration. Students are taught to write programs that are readable, well structured and easy to maintain. Prerequisite: MECH 1170.

CDCM 2372 Introduction to Databases — Introduces database systems including hierarchical, network, and relational databases. Students receive hands-on experience with a commercial database application. Emphasis on engineering and geographic applications. Prerequisite: MECH 1170.

CDCM 3375 CAD Customization 1 — Introduces AutoLISP programming for those with programming experience. Includes AutoLISP programming concepts, development of applications in parameterized drawings, user defined commands and interfacing with the drawing file database. Prerequisite: MECH 2205 or CDCM 3500.

CDCM 3470 Data Structures in C — Continues from CDCM 2370. Students create C programs to process complex engineering data using arrays, structures and lists. Search and sort techniques are studied. Prerequisite: CDCM 2370.

CDCM 3472 CAD/Database Applications —Investigates the integration of non-graphic data with CAD drawing files. The course will cover internal and external storage of data, database integrity and management, creating and maintaining links between data, and the use of ASE, AutoCAD's Structured Query Language (SQL) extension. Prerequisites: CDCM 2372 and MECH 2205.

CDCM 3500 CAD Graphics (AutoCAD) — Presents an extensive overview of AutoCAD. Includes CAD concepts, 2D and 3D constructions, annotations, dimensioning, plotting, and menu customization.

CDCM 3505 CAD Graphics (Microstation) — Introduces Computer Aided Design using Microstation PC software. The course is designed to give students experience in the production of 2D design files from various engineering disciplines. The student will utilize the basic and advanced techniques available in the software including basic element creation, fence manipulations, text, dimensioning, reference files, cell creation, and plotting. The course will also include discussion on CAD hardware requirements, CAD concepts and trends in CAD software development.

CDCM 4470 File Processing in C — Continues from CDCM 3470. In this course, students design and utilize file structures using sequential, direct and keyed indexed file access methods. Prerequisite: CDCM 3470.

CDCM 4475 CAD Customization 2 — Continues from CDCM 3375. This course deals with complex entities, error handling, dialogue box creation and programming, and ADS, AutoCAD's C language interface. Prerequisite: CDCM 3375 and 2370.

CDCM 4600 Advanced CAD Graphics — Covers computer generation of 3D models using wireframe, surface and solid modelling software. Students will create and generate shaded models and animation for engineering applications. Prerequisite: AICO 3000 or CDCM 3500 and 3505.

CDCM 4675 CAD Customization Using Microstation — Introduces MDL Microstation Development Language programming. In addition, the student will be required to develop applications in parametric design and interface with the drawing file database.

CDCM 4690 Post Diploma Project — Allows students to apply the skills learned in coursework to the solution of an industrial problem. The project must be approved by the department and will be jointly supervised by a faculty member and an industry sponsor.

CDCM 5660 Graphic System Management — Covers 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 6660 Graphic Information Management — Provides a detailed discussion of the engineering database and includes graphic standards (IGES, DXF) and graphic translations. It also includes strategies for the integration of non-graphic and graphic information. Prerequisite: CDCM 5660.

COMP 3765 Issues in Networking — Covers communication between computers; networking theory and practice; distributed processing with special emphasis on microcomputers; software management of LAN systems; theory of ETHERNET and ISO standards.

COMP 4575 Graphics Programming — Emphasizes the solution of engineering problems and theory of CAD systems using structured programming techniques. At the completion of the course, the student will understand how a simple CAD system is implemented. Prerequisite: CDCM 3470.

OPMT 3560 Systems Analysis — Introduces problem-solving techniques and analysis tools of industrial engineering and engineering economics; activity sampling, flow process charting, multiple activity charting, economic decision making; assets, liabilities, cash flow, capital cost allowances, after tax discounted cash flow, sensitivity analysis, risk analysis applied to investment decisions.

ENGINEERING

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.

Students participate in an industry-sponsored project (practicum or directed studies) in the second year of the program.

The industry project is an integral program component, which is required for program completion and certification. Students may be required to participate in work experience activities at the industry sponsor's regular place of business.

Program Length
Two years, full-time beginning in September each year.

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 (15 weeks)		hrs/wk	credits
CHEM 1101	Chemistry 1 for Chemical Sciences	6.0	6.0
CHSC 1100	Computer Applications for Chemical Sciences	1.0	1.0
CHSC 1103	Engineering Materials 1*	5.0	3.5
CHSC 1119	Environmental Science*	6.0	4.5
COMM 1135	Introduction to Technical Communication	3.0	3.0
MATH 1411	Basic Technical Mathematics for Chemical Sciences	5.0	5.0
MECH 1800	Interpretation of Engineering Drawing OPMT	2.0	2.0
PHYS 1141	Physics: Chemical Sciences 1	5.0	5.0

Level 2 (20 weeks)		hrs/wk	credits
CHEM 2201	Chemistry 2 for Chemical Sciences	6.0	8.0
CHEM 2204	Chemical Laboratory Techniques	3.0	4.0
CHSC 1202	Laboratory Workshop	2.0	2.0
CHSC 2203	Engineering Materials 2*	5.0	4.5
CHSC 2248	Industrial Chemical Processes*	5.0	4.5
COMM 2241	Technical Communication for Chemical Sciences	3.0	4.0
MATH 2411	Calculus for Chemical Sciences (Term A)*	5.0	3.5
MATH 2412	Statistics for Chemical Sciences (Term B)*	5.0	3.5
PHYS 2141	Physics: Chemical Sciences 2	5.0	6.5

Option: ENVIRONMENTAL AND INDUSTRIAL CHEMISTRY

Level 3 (15 weeks)			
CHEM 3309	Organic Chemistry 1 for Chemical Sciences	6.0	6.0
CHEM 3310	Physical Chemistry	5.0	5.0
CHEM 3314	Analytical Chemistry 1	6.0	6.0
CHSC 3320	Unit Project 1	2.0	2.0
CHSC 3341	Unit Operations 1	6.0	6.0
MATH 3411	Numerical Methods for Chemical Sciences	5.0	5.0

Level 4 (20 weeks)			
CHEM 4409	Organic Chemistry 2 for Chemical Sciences	6.0	8.0
CHEM 4414	Analytical Chemistry 2	6.0	8.0
CHSC 3448	Industrial Chemistry	2.0	2.5
CHSC 4420	Unit Project 2	3.0	4.0

Plus 4 Electives from the following lists:

Environmental Chemistry			hrs/wk	credits
CHEM	4416	Analytical Instrumentation	2.0	2.5
CHSC	3413	Environmental Analytical Methods	3.0	4.0
CHSC	4411	Pollution Science and Microbiology	6.0	8.0
CHSC	4412	Waste Management	3.0	4.0

Industrial Chemistry				
CHSC	4408	Ore Analysis	3.0	4.0
CHSC	4441	Unit Operations 2	6.0	8.0
ELEX	2830	Process Measurement	2.0	2.5
PETR	4403	Process Dynamics	3.0	4.0

Option: PULP AND PAPER

Level 3 (15 weeks)

CHEM	3310	Physical Chemistry	5.0	5.0
CHEM	3314	Analytical Chemistry 1	6.0	6.0
CHSC	3320	Unit Project 1	2.0	2.0
CHSC	3341	Unit Operations 1	6.0	6.0
CHSC	3346	Pulp and Paper	6.0	6.0
MATH	3411	Numerical Methods for Chemical Sciences	5.0	5.0

Level 4 (20 weeks)

CHEM	4414	Analytical Chemistry 2	6.0	8.0
CHSC	3413	Environmental Analytical Methods	3.0	4.0
CHSC	4420	Unit Project 2	3.0	4.0
CHSC	4441	Unit Operations 2	6.0	8.0
CHSC	4446	Pulp and Paper 2	6.0	8.0
ELEX	2830	Process Measurement	2.0	2.5
PETR	4403	Process Dynamics	3.0	4.0

*denotes half-term course

Course Descriptions

CHEM 1101 (CHEM 101) Chemistry 1 for Chemical Sciences — Includes 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 — Continues from CHEM 1101. Topics include oxidation — reduction titrations, electrochemical cells, electrolysis, electroplating, properties of solids, liquids and gases, colligative properties and the chemistry of select metallic and nonmetallic 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 — 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 — Presents organic compounds, 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, alcohols. 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 physicochemical measurements. Prerequisite: CHEM 2201.

CHEM 3314 (CHEM 314) Analytical Chemistry 1 —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 — Covers 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, infrared, 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 — Introduces microcomputer software packages including electronic spreadsheets, databases and graphical methods, with applications to Chemical Sciences Technology.

CHSC 1103 (CHSC 103) Engineering Materials 1 — Covers properties and physical testing of materials including metals, plastics, wood and wood products, concrete, ceramics and nondestructive testing. Microscopy, photomicrography and photography are also covered.

CHSC 1119 (CHSC 119) Environmental Science — Introduces 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 — Presents a basic course in chemical laboratory safety with emphasis on WHMIS practices, safe handling and storage of chemicals, care and use of safety equipment. Assignments on safety-related topics will be given. Prerequisites: CHSC 1119 and CHEM 3309.

CHSC 2203 (CHSC 203) Engineering Materials 2 — Continues from CHSC 1103. Comparative structure and properties of engineering materials including metals, alloys, polymers, ceramics, concrete, wood and composite materials. Service failures of materials including embrittlement, fatigue, wear, creep and corrosion. Basic principles of materials selection. Prerequisite: CHSC 1103.

CHSC 2248 (CHSC 246) Industrial Chemistry 1 — Provides 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. Laboratory sessions involve the testing and control procedures used in industrial applications. This course also covers introductory organic chemistry.

CHSC 3311 (CHSC 311) Pollution Science and Organic Chemistry — Introduces organic chemistry with applications to industrial pollution problems.

CHSC 3320 (CHSC 320) Unit Project 1 — Assigns projects relating to the student's chosen specialty each term. Regular progress reports and a final term report are required. An industrial or laboratory practicum may be required. Prerequisite: CHSC 1119, CHEM 2201.

CHSC 3341 (CHSC 341) Unit Operations 1 — Covers 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. Prerequisite: PHYS 2141, MATH 2411.

CHSC 3346 (CHSC 346) Pulp and Paper 1 — Designed to equip students with basic testing skills and provide hands-on experience with typical mill unit operations. Prerequisites: CHSC 2248.

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 laboratory 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. Prerequisite: CHEM 2201.

CHSC 3448 (CHSC 448) Industrial Chemistry 2 — Covers major chemical process industries. Lecture material is selected from the following topics: mineral processing, chlorine and caustic production, sulfuric acid production, industrial gas production, manufacture of inorganic nitrogen compounds, limestone mining and processing, petroleum refining processes and organic chemical production. Prerequisite: CHEM 1101.

CHSC 4408 (CHSC 408) Ore Analysis — Covers the methods for the determination of a wide variety of elements in ores, concentrates, and industrial process streams. Emphasis is placed on selection of the most suitable technique for the particular samples under investigation. Classic methodology includes gravimetric and volumetric analysis as well as fire assay. Instruments used are atomic absorption, inductively coupled plasma, X-ray fluorescence, and ion chromatograph. A practicum will be scheduled at the end of the term. Prerequisite: CHEM 3314.

CHSC 4411 (CHSC 411) Pollution Science and Microbiology — Discusses air pollution meteorology, air pollution chemistry, air sampling methods, classic and instrumental techniques for measuring atmospheric and indoor contaminants (e.g. hydrogen sulphide, mercaptan, sulphur 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. Prerequisite: CHSC 1119, CHEM 3309.

CHSC 4412 (CHSC 412) Waste Management — Covers the 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. Prerequisite: CHSC 1119.

CHSC 4420 (CHSC 420) Unit Project 2 — See CHSC 3320. Provides a field practicum in the laboratory aspects of the program. Prerequisite: CHSC 3320.

CHSC 4421 (CHSC 421) Pulp and Paper Project — Presents a project relating to the pulp and paper industry, chosen by each student with assistance from faculty advisors. The project involves both library and practicum. Regular written progress reports and a final report are required. Prerequisite: CHSC 3320, 3346.

CHSC 4441 (CHSC 441) Unit Operations 2 — See CHSC 3341. Prerequisite: CHSC 3341.

CHSC 4446 (CHSC 446) Pulp and Paper 2 — See CHSC 3346. Discusses how Pulp and Paper Technology is concerned with pulp bleaching, papermaking, newsprint manufacturing, printing and pollution abatement. 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. Prerequisite: CHSC 3346.

COMM 1135 (TCOM 101) Technical Communication 1 — Covers basic writing and speaking skills needed for communicating technical information in industry. Students complete writing assignments that 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 — Shows students how to 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 — Emphasizes 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.

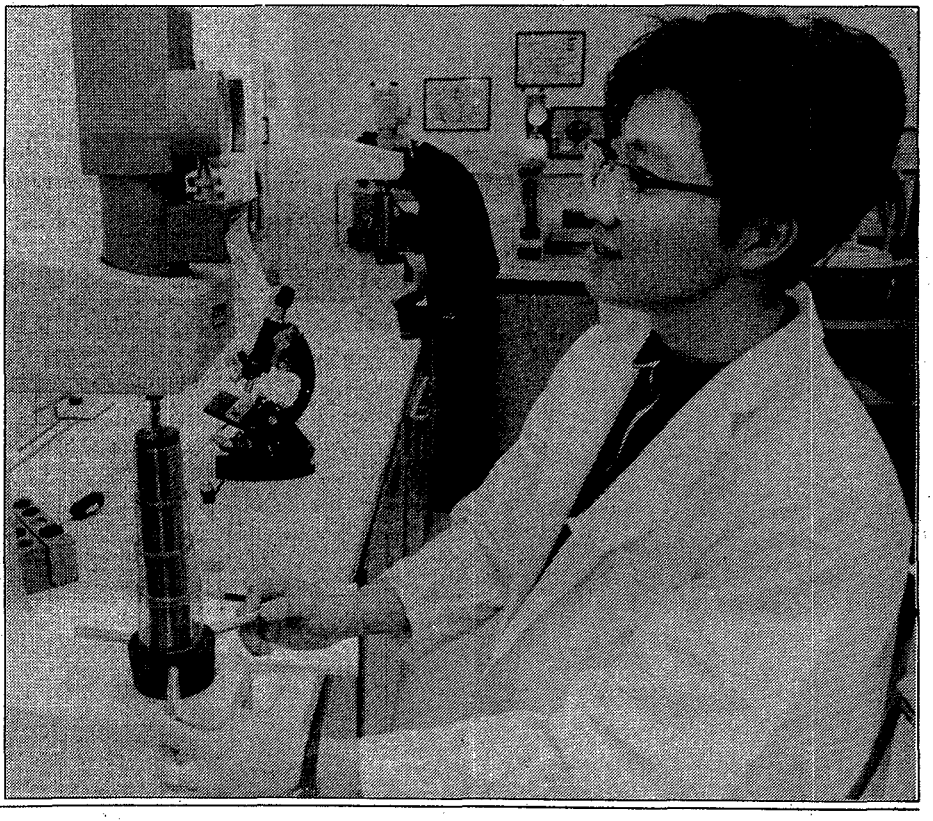
MATH 1411 (MATH 141) Basic Technical Mathematics for Chemical Sciences — Covers graphical linear programming; exponential/logarithmic theory and transformations, common and natural logarithms and logarithmic/semilogarithmic graphs; radian measure; trigonometric functions of any angle, vectors and solution of triangles, graphs of trigonometric functions, identities, compound and double angle formulae, trigonometric equations and inverse functions.

MATH 2411 (MATH 230) Calculus 1 for Chemical Sciences — Includes Delta Process, the derivative, differentiation rules, applied maximum/minimum and error analysis, integration, indefinite and definite integral, area under a curve and volume of solids of rotation. Prerequisite: MATH 1411.

MATH 2412 (MATH 231) Statistics for Chemical Sciences — Covers 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, and sampling, estimation, and basics of hypothesis testing for means and proportions.

MATH 3411 (MATH 341) Numerical Methods for Chemical Sciences — Covers 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. Prerequisite: MATH 2411.

MECH 1800 (MECH 102) Interpretation of Engineering Drawings OPMT — 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.



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: MATH 2471 and CHSC 3341.

PHYS 1141 (PHYS 114) Physics: Chemical Sciences 1 — Begins by covering 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 — Continues with 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

Keith Errington, B.C.L.S.
Acting Associate Dean
S. Berghold
J.M. Berry, B.Sc., Ph.D., Program Head
R. Drouin, Dipl.T.
W. Irvine, B.A., M.Sc., P.Eng.
D. McLeod, A.R.M.T.C., A.I.M.
T. Malakoff, Dipl.T.
T. Voksepp, B.A.Sc., P.Eng.
E. Woo, Dipl.T., A.Sc.T., Certified Assayer

Advisory Committee Members: Chemical Sciences

N. Brodie, Powertech Labs. Inc.
W. Deverall, Analytical Service Laboratories
J. Davidson, Quanta Trace Laboratories Inc.
M. Gow, Ministry of Environment, Lands & Parks
J. Kurdin, Consultant
P. Mussallem
P. Stoddart, Workers' Compensation Board, Chair
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 harbours. 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, both 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 program provides a very broad foundation of knowledge, while yet allowing students opportunities to develop their skills to demonstrate their creativity, ingenuity and critical thinking abilities. Many of the courses, particularly in the second year, utilize industry based projects to reinforce theoretical concepts in an applied setting.

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. As part of their second year of studies, students are also required to participate in an industry-sponsored project (practicum or directed studies) course. Successful completion of this course is required in order to graduate. The industry sponsor is determined by the student and may include work experience activities at the industry sponsor's regular place of business.

Program Length

Two years, full-time beginning in September each year.

Degree Transfer/Completion

Graduates of the Civil and Structural program with sufficiently high standing are granted full credit for their work at BCIT into the Civil Engineering departments at either the University of British Columbia or Lakehead University, Ontario. This will require successfully completing a bridging program for either location.

Alternatively, graduates may consider entering one of the Advanced Diploma programs, such as the Applied Environmental Engineering Technology program. Minimum entrance requirements are the completion of a two-year diploma program.

Students with high academic standing may also obtain transfer credits to other Canadian Universities such as the University of Waterloo and the University of Calgary.

Accreditation

The Civil and Structural Technology program is accredited by the Applied Science Technologists and Technicians of British Columbia as a Technologist program. Full-time students may apply for membership in ASTTBC. Graduates are eligible for Graduate Technologist (ASTTBC) membership and may apply for registration as an Applied Science Technologist after completing a minimum of two years of relevant experience.

Prerequisites

High school graduation with English 12, Math 12 and Physics 11 each with a minimum C grade or better, or by departmental approval.

Exemption from the academic requirements may be made in the case of mature applicants with appropriate practical experience.

ENGINEERING

Program: CIVIL AND STRUCTURAL

Level 1 (15 weeks)

			hrs/wk	credits
CIVL	1000	Statics	6.0	6.0
CIVL	1001	Graphical Communication 1	2.0	2.5
CIVL	1040	Hydrology	3.0	3.0
CIVL	1080	Concrete Technology	3.0	3.0
COMM	1135	Introduction to Technical Communication	3.0	3.0
MATH	1421	Basic Technical Mathematics for Civil & Structural	5.0	5.0
PHYS	1142	Physics for Civil & Structural 1	5.0	5.0
SURV	1130	Surveying for Civil & Structural 1	3.0	3.0

Level 2A (10 weeks)

CIVL	2002	Stress Analysis*	6.0	4.0
CIVL	2003	Graphical Communication 2	2.0	2.5
CIVL	2004	Civil Computer Applications	3.0	4.0
CIVL	2041	Hydraulics 1	3.0	4.0
COMM	2242	Technical Communication for Civil & Structural	3.0	4.0
MATH	2421	Calculus for Civil & Structural	5.0	6.5
PHYS	2142	Physics for Civil & Structural 2	5.0	6.5
SURV	2230	Surveying for Civil & Structural 2	3.0	4.0

Level 2B (10 weeks)

CIVL	2003	Graphical Communication 2	2.0	2.5
CIVL	2004	Civil Computer Applications	3.0	4.0
CIVL	2041	Hydraulics 1	3.0	4.0
CIVL	2160	Elementary Structural Design*	6.0	4.0
COMM	2242	Technical Communication for Civil & Structural	3.0	4.0
MATH	2421	Calculus for Civil & Structural	5.0	6.5
PHYS	2142	Physics for Civil & Structural	5.0	6.5
SURV	2230	Surveying for Civil & Structural 2	3.0	4.0

Second-year Program Options

Set A — Geotechnical/Highways
Set B — Water Resources
Set C — Construction
Set D — Structures

Set A
Geotechnical Highways
Level 3 (15 weeks)

			hrs/wk	credits
CIVL	3006	Highway Design	6.0	6.0
CIVL	3042	Hydraulics 2	3.0	3.0
CIVL	3082	Soil Mechanics 1*	6.0	4.5
CIVL	3164	Structural Design General	6.0	6.0
COMM	3342	Advanced Technical Communication for Civil & Structural	2.0	2.0
MATH	3421	Calculus 2 and Linear Algebra	4.0	4.0
SURV	3330	Surveying for Civil & Structural 3	3.0	3.0

Level 4A (10 weeks)

CIVL	3007	AutoCAD 1 for Civil Engineering	3.0	3.0
CIVL	3120	Subdivision Planning	3.0	3.0
CIVL	3121	Urban Street Design	3.0	3.0
CIVL	4008	Civil Engineering Construction	3.0	4.0
CIVL	4009	Construction Contract Law	1.0	1.5
CIVL	4020	Projects*	3.0	2.0
CIVL	4083	Soil Mechanics 2*	6.0	4.0
COMM	4442	Advanced Technical Communication for Civil & Structural	2.0	2.5
MATH	4421	Statistics for Civil & Structural	3.0	4.0
SURV	4430	Surveying for Civil & Structural 4	3.0	4.0

Level 4B (10 weeks)

			hrs/wk	credits
CIVL	2081	Asphalt Technology	3.0	2.0
CIVL	4008	Civil Engineering Construction	3.0	4.0
CIVL	4009	Construction Contract Law	1.0	1.5
CIVL	4084	Soil Mechanics 3*	6.0	4.0
CIVL	4122	Municipal Services	3.0	4.0
COMM	4442	Advanced Technical Communication for Civil & Structural	2.0	2.5
MATH	4421	Statistics for Civil & Structural	3.0	4.0
OPMT	1180	Introduction to Operations Management*	3.0	2.0
SURV	4430	Surveying for Civil & Structural 4	3.0	4.0

Set B
Water Resources
Level 3 (15 weeks)

CIVL	3006	Highway Design	6.0	6.0
CIVL	3042	Hydraulics 2	3.0	3.0
CIVL	3082	Soil Mechanics 1*	6.0	4.5
CIVL	3164	Structural Design General	6.0	6.0
COMM	3342	Advanced Technical Communication for Civil & Structural	2.0	2.0
MATH	3421	Calculus 2 and Linear Algebra	4.0	4.0
SURV	3330	Surveying for Civil & Structural 3	3.0	3.0

ENGINEERING

Level 4A (10 weeks)			hrs/wk	credits
CIVL	3120	Subdivision Planning	3.0	3.0
CIVL	3121	Urban Street Design	3.0	3.0
CIVL	4008	Civil Engineering Construction	3.0	4.0
CIVL	4009	Construction Contract Law	1.0	1.5
CIVL	4020	Projects*	3.0	2.0
CIVL	4043	Water Resources	3.0	4.0
CIVL	4083	Soil Mechanics 2*	6.0	4.0
COMM	4442	Advanced Technical Communication for Civil & Structural	2.0	2.5
MATH	4421	Statistics for Civil & Structural	3.0	4.0
SURV	4430	Surveying for Civil & Structural 4	3.0	4.0
CIVL	4020	Projects*	3.0	2.0

Level 4B (10 weeks)

CIVL	2081	Asphalt Technology	3.0	2.0
CIVL	3007	AutoCAD 1 for Civil Engineering	3.0	3.0
CIVL	4008	Civil Engineering Construction	3.0	4.0
CIVL	4009	Construction Contract Law	1.0	1.5
CIVL	4043	Water Resources	3.0	4.0
CIVL	4122	Municipal Services	3.0	4.0
COMM	4442	Advanced Technical Communication for Civil & Structural	2.0	2.5
MATH	4421	Statistics for Civil & Structural	3.0	4.0
OPMT	1180	Introduction to Operations Management*	3.0	2.0
SURV	4430	Surveying for Civil & Structural 4	3.0	4.0

Set C
Construction

Level 3 (15 weeks)			hrs/wk	credits
CIVL	3005	Highway Design Basic	3.0	3.0
CIVL	3007	AutoCAD 1 for Civil Engineering	3.0	3.0
CIVL	3042	Hydraulics 2	3.0	3.0
CIVL	3120	Subdivision Planning	3.0	3.0
CIVL	3121	Urban Street Design	3.0	3.0
CIVL	3161	Structures 1	6.0	6.0
CIVL	3164	Structural Design General	6.0	6.0
COMM	3342	Advanced Technical Communication for Civil & Structural	2.0	2.0
MATH	3421	Calculus 2 and Linear Algebra	4.0	4.0
SURV	3330	Surveying for Civil & Structural 3	3.0	3.0

Level 4A (10 weeks)

CIVL	3082	Soil Mechanics 1*	6.0	4.5
CIVL	4008	Civil Engineering Construction	3.0	4.0
CIVL	4009	Construction Contract Law	1.0	1.5
CIVL	4020	Projects*	3.0	2.0
CIVL	4162	Structures 2*	6.0	4.0
COMM	4442	Advanced Technical Communication for Civil & Structural	2.0	2.5
MATH	4421	Statistics for Civil & Structural	3.0	4.0
OPMT	1180	Introduction to Engineering Economics*	3.0	2.0
SURV	4430	Surveying for Civil & Structural 4	3.0	4.0

Level 4B (10 weeks)			hrs/wk	credits
CIVL	2081	Asphalt Technology	3.0	2.0
CIVL	4008	Civil Engineering Construction	3.0	4.0
CIVL	4009	Construction Contract Law	1.0	1.5
CIVL	4083	Soil Mechanics 2*	6.0	4.0
CIVL	4122	Municipal Services	3.0	4.0
CIVL	4166	Structural Detailing*	3.0	2.0
COMM	4442	Advanced Technical Communication for Civil & Structural	2.0	2.5
MATH	4421	Statistics for Civil & Structural	3.0	4.0
SURV	4430	Surveying for Civil & Structural 4	3.0	4.0

Set D
Structures

Level 3 (15 weeks)				
CIVL	3005	Highway Design Basic	3.0	3.0
CIVL	3007	AutoCAD 1 for Civil Engineering	3.0	3.0
CIVL	3042	Hydraulics 2	3.0	3.0
CIVL	3120	Subdivision Planning	3.0	3.0
CIVL	3121	Urban Street Design	3.0	3.0
CIVL	3161	Structures 1	6.0	6.0
COMM	3342	Advanced Technical Communication for Civil & Structural	2.0	2.0
MATH	3421	Calculus 2 and Linear Algebra	4.0	4.0
SURV	3330	Surveying for Civil & Structural 3	3.0	3.0

Level 4A (10 weeks)			hrs/wk	credits
CIVL	3082	Soil Mechanics 1*	6.0	4.5
CIVL	4008	Civil Engineering Construction	3.0	4.0
CIVL	4009	Construction Contract Law	1.0	1.5
CIVL	4020	Projects*	3.0	2.0
CIVL	4162	Structures 2*	6.0	4.0
COMM	4442	Advanced Technical Communication for Civil & Structural	2.0	2.5
MATH	4421	Statistics for Civil & Structural	3.0	4.0
OPMT	1180	Introduction to Operations Management*	3.0	2.0
SURV	4430	Surveying for Civil & Structural 4	3.0	4.0

Level 4B (10 weeks)				
CIVL	2081	Asphalt Technology*	3.0	2.0
CIVL	4008	Civil Engineering Construction	3.0	4.0
CIVL	4009	Construction Contract Law	1.0	1.5
CIVL	4083	Soil Mechanics 2*	6.0	4.0
CIVL	4163	Structures 3*	6.0	4.0
CIVL	4166	Structural Detailing*	3.0	2.0
COMM	4442	Advanced Technical Communication for Civil & Structural	2.0	2.5
MATH	4421	Statistics for Civil & Structural	3.0	4.0
SURV	4430	Surveying for Civil & Structural 4	3.0	4.0

*denotes half-term course

Course Descriptions

CIVL 1000 (CIVL 101) Statics — 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. Prerequisite: MATH 1011 recommended.

CIVL 1001 (CIVL 108) Graphical Communication 1 — Begins with the tracing of drawings with emphasis on line-work, lettering and dimensioning. More difficult assignments involving redrawing details to new scale ratios will be introduced as your skills increase. Drawing layout, overall presentation and completeness of information will round out 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 — 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, and 1 and 2 Inspection Techniques.

CIVL 2002 (CIVL 202) Stress Analysis — Covers 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 — 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. Presentation and comprehension of material will also continue to be stressed, particularly line quality and lettering. AutoCAD will also be introduced to illustrate and practice fundamental commands for drawing preparation. Prerequisite: CIVL 1001.

CIVL 2004 (CIVL 211) Civil Computer Applications — Covers 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, file editing, spreadsheets, and Highway terminology horizontal/vertical curves. 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 — Teaches students to select suitable materials for asphaltic concrete design using the Marshall method. Topics include plant and paving quality control, asphaltic cement testing and calculation for asphaltic design. Prerequisite: CIVL 1080.

CIVL 2160 (CIVL 203) Elementary Structural Design — Teaches students how to apply forces and material properties 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 — Allows students to 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. Prerequisite: CIVL 1040.

CIVL 3006 (CIVL 417) Highway Design — Allows students to 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 and 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 2004.

CIVL 3007 (CIVL 383) AutoCAD 1 for Civil Engineering 1 — Covers basic CADD commands for controlling elements, views, drawings and files. (2) Project using this knowledge/skill 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 quantity takeoffs. Prerequisite: CIVL 1000, 2004.

CIVL 3042 (CIVL 308) Hydraulics 2 — Presents 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 — Covers the principles of basic soil mechanics and soil testing through lectures and laboratory work. Topics include mass/volume relationships, soil classification, compaction, geology, subsurface investigation, permeability and pressure diagrams, effective stress, consolidation and shear strength. Prerequisite: CIVL 1000, 2041 and 3042.

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 engineer's viewpoints, complete with a preliminary cost analysis. Prerequisite: CIVL 1622 and 2003.

CIVL 3121 (CIVL 314) Urban Street Design — Provides a review of the urban street classification system, which will allow 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 constructed drawings will conclude the course. Prerequisite: CIVL 1622 and 2003.

CIVL 3161 (CIVL 322) Structures 1 — Introduces structural analysis of statically indeterminate structures 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 that 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 — Demonstrates how 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 takeoffs, 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 — Introduces 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 among 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 3342.

CIVL 4020 (CIVL 499) Projects — Allows 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.

CIVL 4043 (CIVL 416) Water Resources — Introduces the student to a wide range of water resource problems, methods of analysis and solutions through lectures, problem sessions and field assignments. 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 — Applies the knowledge gained 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 and foundation design. Prerequisite: CIVL 3082.

CIVL 4084 (CIVL 427) Soil Mechanics 3 — Presents lectures, laboratory and project work, and guest lectures to 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; and elementary rock mechanics. Prerequisite: CIVL 4083.

CIVL 4122 (CIVL 412) Municipal Services — 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, in addition to 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 — Allows students to 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 and 3164.

CIVL 4163 (CIVL 424) Structures 3 — Presents the opportunity for an existing bridge to be 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 — Requires students to design connections for structural steel beams, columns, and bracing, and to produce the required drawings for steel fabrication.

COMM 1135 (TCOM 101) Technical Communication 1 — 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 — Allows students to 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) Technical Communication 3 for Civil & Structural — Allows students to 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 2242.

COMM 4442 (TCOM 401) Technical Communication 4 for Civil & Structural — Provides students with the opportunity 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 3342.

MATH 1421 (MATH 142) Basic Technical Mathematics for Civil & Structural — Reviews 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 — Covers 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 and volumes; solution of the differential equations of beams with distributed loads. Prerequisite: MATH 1421.

MATH 3421 (MATH 342) Calculus 2 and Linear Algebra — Covers 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. Prerequisite: MATH 2421.

MATH 4421 (MATH 442) Statistics for Civil & Structural — Presents an organization and graphical presentation of data; elements of probability; discrete and continuous probability distributions; estimating; testing of hypothesis; the Weibull distribution; flood frequency analysis. Prerequisite: MATH 3421.

OPMT 1180 (OPMT 180) Introduction to Engineering Economics — Provides 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, buy-rent-lease evaluation 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 — Emphasizes 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 — Covers 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. Prerequisite: SURV 1130.

SURV 3330 (SURV 330) Surveying for Civil & Structural 3 — See SURV 1130. Prerequisite: SURV 2230.

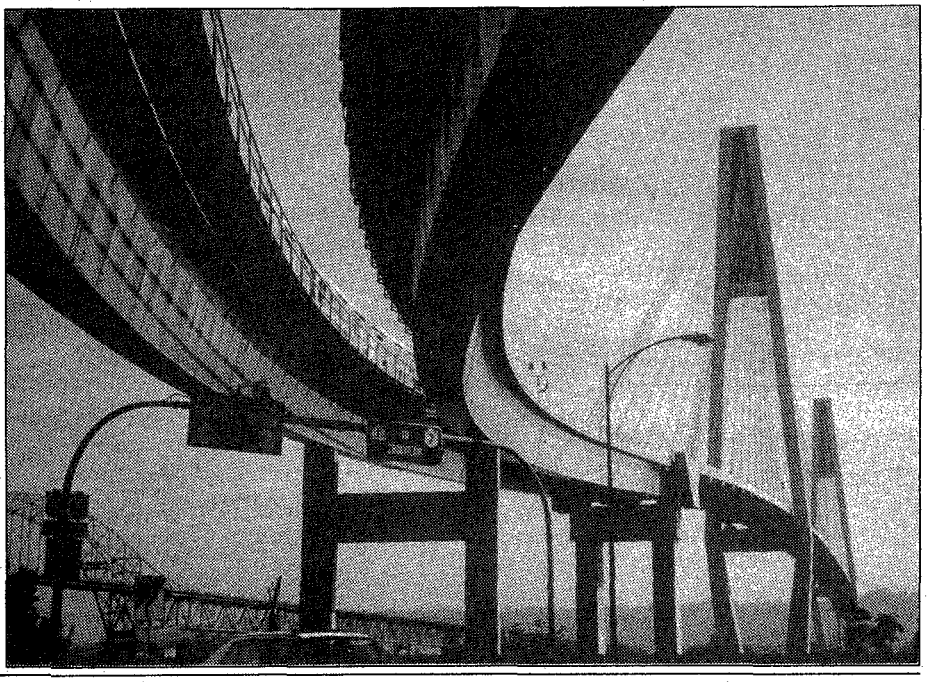
SURV 4430 (SURV 430) Surveying for Civil & Structural 4 — See SURV 1130. Prerequisite: SURV 3330.

Faculty and Staff

Tony Barren, B.Sc., Ph.D., P.Eng, Acting Associate Dean
P. Cunnington, B.Sc., P. Eng., Acting Program Head
T. Abbuhl, Dipl.T., A.Sc.T.
R. Brown, Dipl.T., A.Sc.T.
C. Dalgas, Dip.T., A.Sc.T.
B. Folz, Dip.T., B.Sc., M.A.Sc.
E. Gray, B.A.Sc., P.Eng.
M. Heinekey, B.Tech., Dipl.T., Dipl. Adult Ed., M.B.A., A.Sc.T.
C. Niwinski, M.A.Sc., P. Eng.
A. Payne, B.A.Sc., M.A.Sc., P.Eng.
E. Reid, M.I.C.E., C.Eng., P.Eng.
W.P. Stewart, Ph.D., P.Eng.

Advisory Committee Members: Civil & Structural Technology

A. Black, P.Eng., Associated Engineering Services
R. Chapman, P.Eng., Ministry of Transportation and Highways
B. Conlin, P.Eng., Golder Associates Ltd.
H. Dobbie, A.Sc.T., M.B.A., Dowco Consultants Ltd.
K. Fyvie, A.Sc.T., Terra Engineering Ltd.
D. Halliday, A.Sc.T., Coast Steel Fabricators
B. Jebson, A.Sc.T., Fraser River Pile & Dredging Ltd.
J. Kupskay, P.Eng., Paragon Engineering Ltd.
J. Martens, A.Sc.T., R.F. Binnie & Associates Ltd.
J. Miller, President, JJM Group
T. Pataky, P.Eng., BC Hydro
C. Sinclair, P.Eng., Corporation of Burnaby
T. Timm, P.Eng., City of Vancouver



FISH, WILDLIFE & RECREATION

Diploma Program

See Renewable Resources Technology, page 180.

FOOD TECHNOLOGY

Diploma Program

Graduates are employed by large companies such as Nabob Foods, Labatt and Molson, Sun-Rype and Lucerne Foods, Fraser Valley Foods, and Dairyland Foods as well as in many smaller food processing firms. 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.

Students participate in an industry-sponsored project (practicum or directed studies) in the second-year of the program. The industry project is an integral program component that is required for completion and certification. Students may be required to participate in work experience activities at the industry sponsor's regular place of business.

Program Length

Two years, full-time beginning in September each year.

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.

*Note: The Food Technology curriculum is currently under review. Courses offered may differ from those described in the calendar.

Program: FOOD TECHNOLOGY

Level 1 (15 weeks)			hrs/wk	credits
BIOT	1020	Introductory Microbiology	6.0	6.0
CHEM	1103	Chemistry 1 for Biological Sciences	6.0	6.0
FOOD	1030	Biology	5.0	5.0
FOOD	1090	Introduction to Food Technology	3.0	3.0
MATH	1441	Basic Technical Mathematics for Biological Sciences	6.0	6.0
PHYS	1144	Physics for Bio Sciences 1	5.0	5.0

Level 2 (20 weeks)				
CHEM	2203	Chemistry 2 for Biological Sciences	6.0	8.0
COMM	1244	Communication for Food Technology	4.0	5.5
FOOD	2010	Food Processing 1	6.0	8.0
FOOD	2020	Microbiology for Food Processing	5.0	6.5
MATH	2441	Statistics for Biological Sciences	5.0	6.5
PHYS	2144	Physics for Bio Sciences 2	5.0	6.5

Level 3 (15 weeks)				
BUSA	1100	Management	3.0	3.0
CHEM	3311	Instrumental Analytical Methods	5.0	5.0
FOOD	3010	Food Processing 2	5.0	5.0
FOOD	3030	Quality Control 1	4.0	4.0
FOOD	3040	Food Analysis 1	5.0	5.0
FOOD	3250	Sanitation for Food Processing	6.0	6.0
OPMT	1343	Operations Management for Food Technology	3.0	3.0

Level 4 (20 weeks)			hrs/wk	credits
COMM	2454	Advanced Communication for Food Technology	3.0	4.0
ELEX	2825	Instrumentation for Biological Science	3.0	4.0
FOOD	4010	Food Processing 3	5.0	6.5
FOOD	4020	Process Systems for Food Technology	5.0	6.5
FOOD	4030	Quality Control 2	4.0	5.5
FOOD	4040	Food Analysis 2	5.0	6.5
FOOD	4390	Directed Studies for Food Technology (Practicum)	3.0	4.0
MATH	4441	Microcomputer Applications for Food Technologies	2.0	2.5

Course Descriptions

BIOT 1020 (BISC 102) Introductory Microbiology — Designed to train students in the basic microbiological procedures employed in a laboratory, including the use and care of the microscope; staining methods, aseptic techniques; and methods of identifying important microorganism.

BUSA 1100 (ADMN 102) Management — Presents 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 — Introduces 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 — Introduces organic chemistry with specific topics related to food technology. Topics include carbohydrates, lipids, proteins, and solvents. Isomerism of selected compounds is discussed. Laboratory exercises consist of quantitative and qualitative analysis, and separation of organic compounds. Prerequisite: CHEM 1103.

CHEM 3311 (CHEM 311) Instrumental Analytical Methods — Covers instrumentation used for chemical analysis. The theory, construction, application and operation of instrumentation is discussed. Instruments include spectrophotometry (visible, ultra violet, near infrared and infrared, emission, absorption), flame photometry, chromatography (gas, liquid, high pressure liquid). Laboratory exercises involve use of these instruments. Prerequisite: CHEM 2203.

COMM 1244 (TCOM 101) Communication for Biotechnology/Food Technology — Teaches the skills necessary for success in the food industry. Students learn technical writing, speaking and presentation techniques, and the correct formats for reports, instructions and lab reports. They also research and deliver an oral report on a new development in their technology, develop job-search skills, take part in a meeting and give a persuasive oral presentation.

COMM 2454 (TCOM 221) Advanced Communication for Food Technology — Allows students to 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. (This course is coordinated with Food 4390 Directed Studies for Food Technology.) Prerequisite: COMM 1244.

ELEX 2825 (ELEC 253) Instrumentation for Biological Science — Covers 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 (PLC) are presented so that food technologists can communicate their needs to PLC programmers.

FOOD 1030 (BISC 103) Biology — Presents a study of the principles underlying living phenomena including the organizational attributes of living matter. Development of system will be compared 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 — Introduces 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. Students will be involved in an abbreviated student success program.

FOOD 2010 (BISC 201) Food Processing 1 — Introduces the principles and processes of canning, freezing, dehydrating and fermentation of foods; the use of salt, sugar and additives to preserve food; and the importance of food packaging. Experimental portions of food will be preserved by various methods during lab periods. Prerequisite: BIOT 1020, CHEM 1103.

FOOD 2020 (BISC 202) Microbiology for Food Processing — Presents the application of microbiology to food manufacturing; the isolation of microorganism significant to food processing; maintaining high microbiological standards in processed foods; spoilage control, food fermentation; assessing microbiological test results and report writing to management. Prerequisite: BIOT 1020.

FOOD 3010/4010 (BISC 301/401) Food Processing 2 and 3 — Presents 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, flavourings, colouring and preservatives will be discussed. Prerequisite: FOOD 2010.

FOOD 3030 (BISC 303) Quality Control 1 — Provides 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 colour in foods. Prerequisite: MATH 2441.

FOOD 3040 (BISC 304) Food Analysis 1 — Introduces 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 2203.

FOOD 3250 (BISC 406) Sanitation for Food Processing — Stresses the good manufacturing practices, personal hygiene, HACCP systems relating to the sanitation of food plants. 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. Prerequisite: Completion of Level 2.

FOOD 4010 (BISC 401) Food Processing 3 — See FOOD 3010. Prerequisite: FOOD 3010.

FOOD 4020 (BISC 402) Process Systems for Food Technology — Presents the acquisition and handling of materials for food processing. 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 2144.

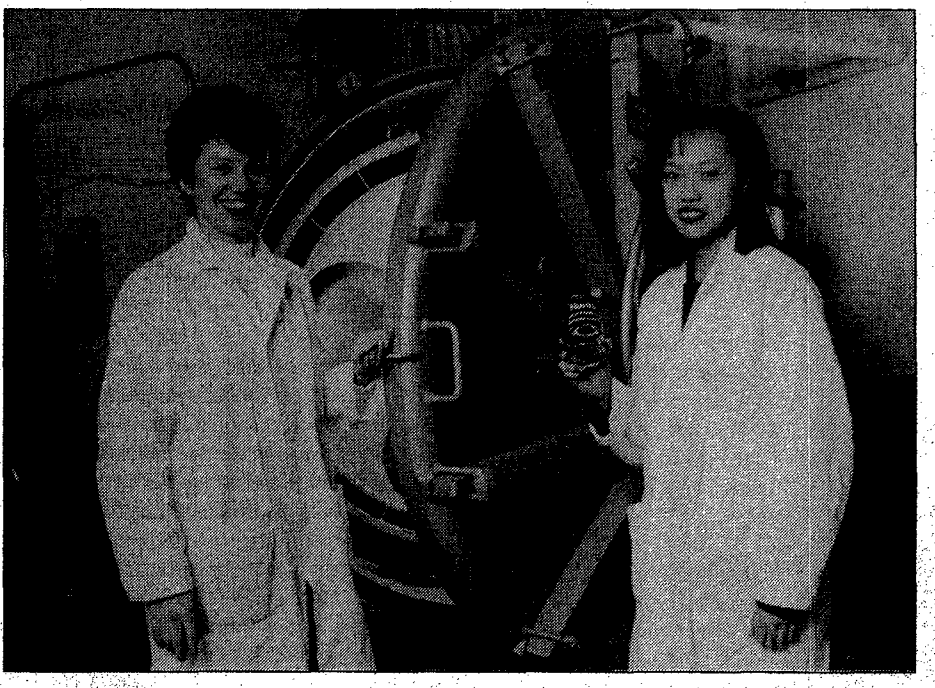
FOOD 4030 (BISC 403) Quality Control 2 — Cover the sensory evaluation of food; facility design, selection of taste panels; statistical analysis of data; laboratory measurement of consistency and texture of foods; recording and reporting with control charts. Prerequisite: FOOD 3030.

FOOD 4040 (BISC 404) Food Analysis 2 — Introduces 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 3311.

FOOD 4390 Directed Studies for Food Technology (Practicum) — Works on an appropriate industry-related practicum project under the supervision of a faculty advisor. Course requirements will include literature review, methodology and progress reports, as well as final oral and written technical reports. Prerequisite: Completion of Term 3 courses in Food Technology.

MATH 1441 (MATH 144) Basic Technical Mathematics for Biological Sciences — Covers 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, and definite integral with area under a curve; introduction to MS-DOS computing using spreadsheet software.

MATH 2441 (MATH 244) Statistics for Biological Sciences — Covers 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. Prerequisite: MATH 1441.



MATH 4441 (MATH 444) Microcomputer Applications for Food Technology — Presents 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.

OPMT 1343 (OPMT 353) Operations Management for Food Technology — 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 for Bio Sciences 1 — 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 for Bio Sciences 2 — Continues with 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

Doug Deans, B.A., Acting Dean
K. Cummings, Dipl.T.
A. McCannel, B.Sc., M.Sc.
V. Martens, B.S.A., M.Sc., P.Ag., Program Head, Food Technology
J. Nichols, B.Sc., M.Sc., Ph.D.
J. Soutter, H.D.F.T., A.Sc.T.
K. Turner, B.Sc., M.Sc., P.Ag.

Advisory Committee Members: Food Technology

G. Christie, Dairyland Foods
R. Clark, Flavour House Ltd.
K. Dyck, Nabob Foods Ltd.
D. Eto, Gourmet Bakery
A. Gelder, Lucerne Foods Ltd., Chair
B.F. McCrum, Agriculture Canada
R. Minchin, Thos. J. Lipton Ltd.
R. Patterson, Lilydale Poultry Coop
A. Richmond, Molson Breweries
S. Schenkeveld, Fisheries & Oceans Canada
I. Woodrow, Corel Food Corp.

ENGINEERING

FORESTRY
Diploma Program

See Renewable Resources Technology, page 180.

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 nine-month program format, through part-time studies, or a combination of these.

The curriculum combines theory and practice and covers GIS principles, training in GIS software, technical issues in GIS, remote sensing, digital mapping and management issues in GIS. Students participate in an industry-sponsored project (practicum or directed studies) in the program. The industry project is an integral program component, which is required for completion and certification. Students may be required to participate in work experience activities at the industry sponsor's regular place of business.

Entrance Requirements

Diploma of Technology or University/ College Degree in a related field. Students should possess good communication and technical problem-solving skills, a good disposition towards team work, fundamental computer literacy and computer programming skills. Applicants must meet BCIT's English language requirement.

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. ADP courses are selected from the following categories:

	credits
Advanced Diploma Program (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 mapping and databases.

Students lacking formal education or proven ability in these areas will be required to complete the following foundation technology courses or their equivalent.

GIS Foundation Technology

			hrs/wk	credits
CDCM	2370	Program Design in C	3.0	3.0
CDCM	2372	Database Systems	3.0	3.0
CDCM	3470	Data Structures in C*	4.0	2.5
GIST	5108	Fundamentals of Mapping	3.0	3.0
GIST	5121	Applied Mathematics 1	3.0	3.0
GIST	5130	Technical Topics in Computer Systems	3.0	3.0
GIST	6121	Applied Mathematics 2*	4.0	3.0

Some of these foundation courses may be taken concurrently with ADP Core and Advanced Technology Courses; however, students should attempt to complete these courses before entering the program.

ADP Technology (27 credits required)

Core (15 credits)

			hrs/wk	credits
GIST	5100	Fundamentals of GIS	3.0	3.0
GIST	5128	ARC/INFO GIS Level 1*	6.0	3.0
GIST	6100	Technical Issues in GIS*	4.0	3.0
GIST	6128	ARC/INFO GIS Level 2*	6.0	3.0
GIST	6132	GIS Database Systems*	4.0	3.0

Additional courses in GIS software may be offered in 1996/97. Details not available at press time.

Advanced Technology (12 credits)

GIST	6101	Selected Topics in GIS*	4.0	3.0
GIST	6102	Applications Modelling and Customization*	4.0	3.0
GIST	6108	Digital Mapping*	4.0	3.0
GIST	6118	Remote Sensing*	4.0	3.0

Management (8 credits minimum)

Required:

GIST	6110	Management Issues in GIS*	4.0	3.0

Electives: (Suggested)

CDCM	5660	Graphic System Management*	3.0	2.0
GIST	6135	GIS System Management*	4.0	3.0

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	3.0
GIST	5120	Project Planning	3.0	3.0
GIST	6120	Project	6.5	9.0

*denotes half-term course

ENGINEERING

Course Descriptions

CDCM 2370 Programming in C — Introduces modern programming practices with emphasis on structured programming, modularization, and the top-down approach to problem solving. C is used as the language for illustration. Students are taught to write programs that are readable, well structured and easy to maintain. Prerequisite: MECH 1170.

CDCM 2372 Database Systems — Introduces database systems including hierarchical, network and relational models. Students will receive hands-on experience with commercial database software. Emphasis in engineering and geographic applications. Prerequisite: MECH 1170.

CDCM 3470 Data Structures in C — Continues from CDCM 2370. Students create C programs to process complex engineering data using arrays, structures and lists. Search and sort techniques are studied. Prerequisite: CDCM 2370.

CDCM 5660 Graphic System Management — Covers 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.

GIST 5100 Fundamentals of Geographic Information Systems — Presents 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 Fundamentals of Photogrammetic 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 and accuracy of spatial data. Prerequisite: GIST 6121.

GIST 5119 Technology Assessment — Presents hardware and software for GIS and related technologies. System comparison and evaluation for project implementation.

GIST 5120 Project Planning — Allows to students to research project topics, present a project proposal, establish supervisors, identify sources of data and begin data acquisition.

GIST 5121 Applied Mathematics 1 — Covers numerical methods, floating point computations, matrices, and simultaneous linear equations, interpolation methods, approximation methods, linear algebra and solutions to non-linear equations.

GIST 5128 ARC/INFO GIS Level 1 — Introduces 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 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 6100 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 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 and multimedia. Prerequisite: GIST 6100.

GIST 6102 Applications Modelling and Customization — Examines raster and vector methods of modelling with GIS software; customization of GIS software: macro programming, menu development and applications programming interfaces. Prerequisites: GIST 5100 and 6128.

GIST 6108 Digital Mapping — Examines standard practices for compilation, transformation, editing and storage of digital spatial data. Prerequisite: GIST 5108 and 6121.

GIST 6110 Management Issues in GIS — Covers GIS project management, GIS integration with external systems, data acquisition and conversion issues, training issues and spatial data management. Prerequisite: GIST 6100.

GIST 6118 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 Project — Continues from GIST 5120. Students will implement and manage a major independent project. Prerequisite: GIST 5120 and all course requirements.

GIST 6121 Applied Mathematics 2 — Spatial Statistics. Prerequisite: GIST 5121.

GIST 6128 ARC/INFO GIS Level 2 — Continues from GIST 5128 covering use of ARC macro language programming, coordinate geometry, digital terrain modelling, analytical GIS functions, data import/export and cartographic production. Prerequisite: GIST 5128.

GIST 6132 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 and distributed systems. Linking databases and GIS. Prerequisite: GIST 5128 and (CDCM 2372 or COMP 1222).

GIST 6135 GIS System Management — Covers account management, system backup, startup and shutdown procedures, system accounting, system security. Introduction to networking, distributed GIS databases in a heterogeneous computing environment. Prerequisite: GIST 5130 or equivalent industry experience.

ENGINEERING

Faculty and Staff

Tony Barren, B.Sc., Ph.D., P.Eng., Acting Associate Dean
J. Candy, H.N.C., Dipl.T., B.Sc.(Hons), Part-time Studies Coordinator
S. Churchill, Dipl.T., B.Sc.(Hons), P.Geo.
R. Miller, Dipl.T., B.A., M.Sc., Program Head

Advisory Committee Members: Geographic Information Systems

R. Balser, Ministry of Crown Lands
M. Feuchtwanger, M.F. Consulting
C. Goodbrand, Reid, Collins and Associates
W. Herdin, District of Coquitlam
C. Hermansen, Timberline, Chair
W. Johnstone, Spatial Vision Consulting
R. Lake, MacDonald Dettwiler and Associates
T. Naylor, City of Surrey
F. Peet, Eidetic Digital Imaging Ltd.
T. Poiker, Simon Fraser University
D. Reiners, Digital Mapping Group Ltd.
K. Standing, Greater Vancouver Regional District
P. Sallaway, Essential Planning Systems Ltd.
D. Stewart, ESRI Canada Ltd.
B. Whitehead, MacMillan Bloedel

GEOMATICS TECHNOLOGY (FORMERLY SURVEYING AND MAPPING)

Diploma Program
Technician Program

The skills of the geomatics 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 Geomatics department presents a training program at 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 may participate in an industry-sponsored project (practicum or directed studies) in the second year of the program.

The industry project is an integral program component, which is required for completion and certification. Students may be required to participate in work experience activities at the industry sponsor's regular place of business.

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. The Technicians program will only be offered if sufficient students are available. Those students who can handle the Math and Physics courses should complete the 1st year of the Geomatics program.

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.

Accreditation

The Geomatics Technology diploma program is accredited by the Applied Science Technologists and Technicians of British Columbia as a Technologist program. Full-time students may apply for student membership in ASTTBC. Graduates are eligible for Graduate Technologist Membership and may apply for registration as an Applied Science Technologist after completing a minimum of two years of relevant experience.

ENGINEERING

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: GEOMATICS

Level 1 (15 weeks)

		hrs/wk	credits
COMM 1135	Introduction to Technical Communication	3.0	3.0
MATH 1511	Basic Technical Mathematics for Surveying	7.0	7.0
PHYS 1151	Physics for Surveying 1	5.0	5.0
SURV 1161	Surveying Computations 1	3.0	3.0
SURV 1162	Surveying Instrumentation 1	1.0	1.0
SURV 1164	Field Surveying 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 (10 weeks)

COMM 2251	Technical Communication 2 Surveying	3.0	4.0
MATH 2511	Calculus for Surveying	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 2264	Field Surveying 2	8.0	10.5
SURV 2265	Surveying CAD 1	2.0	2.5
SURV 2267	Photogrammetry 1	2.0	1.5
SURV 2272	Computer Applications 2	2.0	2.5

Level 2B (10 weeks)

COMM 2251	Technical Communication Surveying	3.0	4.0
MATH 2511	Calculus for Surveying	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*	2.0	1.5
SURV 2264	Field Surveying 2	8.0	10.5
SURV 2265	Surveying CAD 1	2.0	2.5
SURV 2272	Computer Applications 2	2.0	2.5

Major: SURVEYING

Level 3 (15 weeks)

MATH 3511	Matrix Methods for Surveying	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 Surveying 3	6.0	6.0
SURV 3365	Surveying CAD 2	2.0	2.0
SURV 3367	Photogrammetry 2	2.0	TBA
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 (10 weeks)

MATH 4511	Statistics for Surveying*	6.0	4.0
SURV 4461	Surveying Computations 4	3.0	4.0
SURV 4462	Geodetic Surveying 2	4.0	TBA
SURV 4463	Adjustment of Surveying Measurements 1+2*	3.0	2.0
SURV 4464	Field Surveying 4	7.0	9.5
SURV 4465	Surveying CAD 3	3.0	4.0
SURV 4467	Photogrammetry 3	3.0	4.0
SURV 4472	Engineering Surveying*	2.0	1.5

Level 4B (10 weeks)

SURV 4461	Surveying Computations 4	3.0	4.0
SURV 4463	Adjustment of Surveying Measurements 1+2*	3.0	2.0
SURV 4464	Field Surveying 4	7.0	9.5
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 4480	Land Information Systems*	3.0	2.0
SURV 4562	Astronomy*	3.0	2.0

Major: PHOTOGRAMMETRY

Level 3 (15 weeks)

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	2.0	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	6.0
SURV 3378	Mining Surveying	2.0	2.0

Level 4A (10 weeks)

MATH 4511	Statistics for Survey*	6.0	4.0
SURV 4461	Surveying Computations 4	3.0	4.0
SURV 4462	Geodetic Surveying 2*	3.0	2.0
SURV 4463	Adjustment of Surveying Measurements 1+2*	3.0	2.0
SURV 4465	Surveying CAD 3	3.0	4.0
SURV 4467	Photogrammetry 3	3.0	4.0
SURV 4472	Engineering Surveying*	2.0	1.5
SURV 4477	Photogrammetry Lab 2	7.0	9.5

Level 4B (10 weeks)			hrs/wk	credits
SURV	4461	Surveying Computations 4	3.0	4.0
SURV	4463	Adjustment of Surveying Measurements 1+2*	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	4477	Photogrammetry Lab 2	7.0	9.5
SURV	4480	Land Information Systems*	3.0	2.0
SURV	4562	Astronomy*	3.0	2.0

Program: TECHNICIAN

(runs only if numbers warrant)

Level 1 (15 weeks)

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	3.0
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 (20 weeks)

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	2.0	2.5
SURV	2267	Photogrammetry 1*	2.0	1.5
SURV	2268	Field Surveying Techniques	14.0	18.5
SURV	2272	Computer Applications 2	2.0	2.5

*denotes half-term course

Course Descriptions

COMM 1135 (TCOM 101) Introduction to Technical Communication — Teaches 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 2 for Surveying — Teaches the fundamentals of job seeking, meeting and reporting. Students participate in meetings and give an oral technical report. They write resumes, job application letters, technical briefs and proposals, as well as occurrence, trip, progress, evaluation and recommendation reports. Prerequisite: COMM 1135.

MATH 1511 (MATH 151) Basic Technical Mathematics for Surveying — Reviews algebra with applications to Surveying; 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 Surveying — Covers 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. 3D analytic geometry, partial differentiation.

MATH 3511 (MATH 351) Matrix Methods for Surveying — Presents 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. Prerequisite: MATH 2511.

MATH 4511 (MATH 451) Statistics for Surveying — Presents 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. Prerequisite: MATH 3511.

PHYS 1151 (PHYS 123) Physics for Surveying 1 — Includes 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 — Covers 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 — Introduces surveying equipment, its design, function, operation, testing and adjustment, care and handling.

SURV 1164 (SURV 164) Field Surveying 1 — Introduces 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 leveling; benchmark and detail leveling; 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 — Allows 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. 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.

SURV 1172 (SURV 172) Computer Applications 1 — Designed to familiarize the student with the operation of the hand held computer from two perspectives: first, as a calculator to do typical 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 — Reviews 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 — Covers the 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 — Continues from SURV 1162.

SURV 2263 (SURV 367) Earth Sciences — Presents 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 Surveying 2 — Covers UTM traverse and computations; different field methods of angle measurements; trigonometric leveling; 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 EDMs. Prerequisite: SURV 1164 and 1161.

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 and CIVL 1001.

SURV 2267 (PHOT 267) Photogrammetry 1 — Introduces 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 — Presents an intensified field-oriented course. Successful completion will give students the ability to carry out routine survey tasks. These will include extensive practice in the use of surveyor's levels, theodolites and various types of EDMs. Prerequisite: SURV 1164.

SURV 2272 (SURV 272) Computer Applications 2 — Continues from SURV 1172. Topics include BASIC programming for strings, For-next loops, subroutines, data files, introduction to MS-DOS, introduction to word processing and serial communication for hand-held computers. Prerequisite: SURV 1172.

SURV 3361 (SURV 361) Surveying Computations 3 — Covers 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 — Covers 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 leveling; 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 — Covers 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 Surveying 3 — Presents 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. Prerequisites: SURV 2261, 2264, and MATH 2511.

SURV 3365 (SURV 365) Surveying CAD 2 — Introduces Microstation for Geomatics. Topics covered include 2D element constructions and manipulations, data entry, data editing, Symbol creation and plotting. Prerequisite: SURV 1162.

SURV 3367 (PHOT 367) Photogrammetry 2 — Presents 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 — Includes 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 — Presents the advanced aspects of the QUICK BASIC programming language and achieve moderate proficiency in writing programs for survey computations and graphics. Prerequisite: SURV 2272.

SURV 3377 (PHOT 377) Photogrammetry Lab 1 — Covers 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; and 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; and 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 — Covers close satellite theory, Doppler positioning, the Global Positioning System. Prerequisite: SURV 3362.

SURV 4463 (SURV 363) Adjustment of Surveying Measurements 1 — Covers 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. Prerequisites: SURV 2261 and MATH 3511.

SURV 4464 (SURV 464) Field Surveying 4 — Allows students to 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) Surveying CAD 3 — Continues from SURV 3365. This course will cover 3D design files in greater detail and then work with third party Microstation software for road design and digital mapping. Prerequisite: SURV 3365.

SURV 4467 (PHOT 467) Photogrammetry 3 — Reviews 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 — Introduces the Canadian legal system, real property law and 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 — Presents 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 — Covers 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 — Covers design and operation of land-related information systems and their role in digital mapping and spatial data management, including concepts of information and LRISs, 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 LRISs. Review and evaluation of some major LRISs.

SURV 4562 Astronomy — Presents 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.

Faculty and Staff

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R. Bremner, Dipl.T., A.Sc.T.
B. Crocker
D. Conroy, Dipl.T.
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K. Frankich, Dipl.Ing., M.A.Sc., Ph.D., Acting Program Head
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Advisory Committee Members: Surveying and Mapping Technology

P. Mueller, B.C.L.S., City of Surrey, Chair
N. Bennett, Bennett & Associates
B. Bunting, A.Sc.T., R.F. Binnie & Associates Ltd.
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P. McCarron, Dipl. T., Pro-Tech Surveys Ltd.
C. Ramsay, Dipl.T., Ministry of Transportation and Highways
S. Russell, P.Eng., Delcan Corporation
R. Sandilands, Canadian Hydrographic Service (Retired)
J. Shortreid, C.L.S., Shortreid Terrain Data Ltd.
D. Trevorrow, B.C.L.S.
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MECHANICAL DESIGN AND MANUFACTURING ENGINEERING TECHNOLOGIES

Diploma Programs

- Mechanical Engineering Technology
  - CAD/CAM
  - Mechanical Design
  - Mechanical Manufacturing
  - Mechanical Systems
- Plastics
- Robotics and Automation
- Industrial Education (Technology Education) Teacher Education (IETE)

MECHANICAL TECHNOLOGY

The Mechanical Engineering Technology program is a program accredited by the Applied Science Technologist and Technicians of British Columbia. This program is designed to provide graduates with a sound background in the principles of mechanical engineering, allowing the students to select one of four areas of specialization following the completion of a common first year. The areas of specialization are CAD/CAM, Mechanical Design, Mechanical Manufacturing and Mechanical Systems.

Students participate in an industry-sponsored project (practicum or directed studies) in the second- year of the program.

The industry project is an integral program component, which is required for completion and certification. Students may be required to participate in work experience activities at the industry sponsor's regular place of business.

Program Length

Two years, full-time beginning in September each year.

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 and experience. 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

Graduates have continuing education opportunities through the Mechanical Advanced Diploma programs.

The Programs

Following the completion of the common first-year, students will select one of the following areas of specialization:

CAD/CAM

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 implications 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.

ENGINEERING

MECHANICAL DESIGN

Mechanical Engineering Design requires a broad range of knowledge of machinery design, fabrication and production technologies, electrical machinery, thermal and fluid systems, hydraulics and pneumatics, advanced materials, instrumentation and controls, CAD/CAM (Computer Aided Design and Manufacture), and CAE (Computer Aided Engineering) software packages. With the broad base of knowledge obtained in this program, a graduate can design or improve existing design of products or systems. Design can offer an exciting and rewarding career providing the satisfaction of seeing a newly developed product from conception to production.

Job Opportunities

A Mechanical Manufacturing Technologist has diverse employment opportunities in such industries as pulp and paper, mining, oil refineries, sawmills, machinery design and manufacturing companies, power generation, steel mills, electrical and electronics manufacturers and consulting engineering firms. Positions of employment include design draftsperson, production technologists, maintenance, cost estimating, technical sales and services, plant engineering staff and machinery operator. Supervisory and management positions may be assumed after appropriate job experience.

MECHANICAL MANUFACTURING

Manufacturing requires knowledge of production technologies, process automation, material properties as well as modern manufacturing management strategies such as Material Resource Planning (MRP). To produce competitive products, modern manufacturers "design for manufacture" thus manufacturing technologists are involved in the entire design/production cycle of a product. This program provides its graduates with the necessary knowledge to embark on a rewarding career in Mechanical Manufacturing.

Job Opportunities

A Manufacturing Technologist has employment opportunities in industries producing wood products, mechanical components, electrical/electronic assemblies, food products, etc. The duties of a manufacturing technologist include production planning, tool and/or product design, process automation, cost estimating and manufacturing management.

MECHANICAL SYSTEMS

Changing construction practices for buildings and higher energy utilization standards for mechanical equipment is presenting an increasing challenge to the mechanical systems industry. Mechanical systems should provide a comfortable, healthy and safe environment, be energy efficient, economically practical and meet the requirements of good engineering practice. The mechanical systems person is a team member, relating the Heating, Ventilating and Air Conditioning (HVAC), plumbing, electrical, controls and fire protection systems with architectural and structural parameters. High expectations from both the public and a dynamic industry provide many opportunities for challenging careers.

Job Opportunities

Advancing technology provides the Mechanical Systems graduate with a growing field of career opportunities in consulting engineering offices assisting in design, specification writing, and construction inspection, with contractors; estimating, planning and scheduling, with suppliers; in design and technical sales, or with systems balancing companies; setting up and adjusting equipment in areas of HVAC, systems controls, fire protection, plumbing and mechanical maintenance systems. Supervisory posts may be assumed after appropriate job experience.

The programs are in a process of "continuous improvement," thus the actual courses may vary from those shown.

MECHANICAL TECHNOLOGY

Common First-year Courses

Level 1 (15 weeks)		hrs/wk	credits
CHSC 1105	Engineering Materials 1	4.0	4.0
COMM 1149	Technical Communication	4.0	4.0
MATH 1491	Technical Mathematics for Mechanical	5.0	5.0
MECH 1100	Engineering Graphics 1	3.0	3.0
MECH 1105	CAD Graphics 1	4.0	4.0
MECH 1120	Introduction to Thermal Processes	3.0	3.0
MECH 1140	Statics	4.0	4.0
MECH 1170	Computer Applications	3.0	3.0

Level 2 (20 weeks)		hrs/wk	credits
CHSC 2205	Engineering Materials 2	4.0	5.5
MATH 2491	Calculus for Mechanical	4.0	5.5
MECH 1210	Manufacturing Processes	4.0	5.5
MECH 2200	Engineering Graphics 2	3.0	4.0
MECH 2205	CAD Graphics 2	4.0	5.5
MECH 2240	Strength of Materials	4.0	6.0
MECH 2245	Dynamics	4.0	5.5
PHYS 2149	Physics for Mechanical	4.0	5.5

CAD/CAM OPTION

Second-year Courses

Level 3 (15 weeks)

CDCM 2370	Program Design in C	3.0	3.0
CDCM 2372	Database Systems	3.0	3.0
CDCM 3305	CAD Graphics 3	3.0	3.0
CDCM 3375	CAD Customization	4.0	4.0
MANU 3318	CNC Programming	5.0	5.0
MATH 3491	Numerical Methods for Mechanical	4.0	4.0
MECH 3340	Machine Design 1	4.0	4.0
MECH 3345	Computer Aided Engineering	4.0	4.0

Level 4 (20 weeks)

CDCM 3460	CAD/CAM System Management	3.0	4.0
CDCM 3470	Data Structures in C (Term 4A)*	4.0	2.5
CDCM 3472	CAD/Database Applications (Term 4B)*	3.0	2.5
CDCM 4405	CAD Graphics 4	4.0	5.5
CDCM 4470	File Processing in C (Term 4B)*	4.0	2.5
CDCM 4475	CAD Customization 2 (Term 4A)*	3.0	2.0
CDCM 4490	CAD/CAM Projects	5.0	6.5
COMM 2460	Advanced Technical Communication for CAD/CAM	4.0	5.5
MATH 4602	Mathematics for CAD/CAM	4.0	5.5
MECH 4440	Machine Design 2	5.0	6.5

ENGINEERING

DESIGN OPTION

Second-year Courses

Level 3 (15 weeks)		hrs/wk	credits
ELEX 2845	Electrical Equipment	4.0	4.0
MANU 3316	Advanced Materials	4.0	4.0
MATH 3491	Numerical Methods	4.0	4.0
MECH 2350	Fluid Power 1	3.0	3.0
MECH 3320	Thermal Engineering 1	4.0	4.0
MECH 3325	Fluid Mechanics	4.0	4.0
MECH 3340	Machine Design 1	4.0	4.0
MECH 3345	Computer Aided Engineering	4.0	4.0

Level 4 (20 weeks)

COMM 2449	Technical Communication	4.0	5.5
ELEX 2835	Instrumentation for Mechanical	4.0	5.5
MECH 3445	Theory of Mechanisms (Term 4B)	4.0	TBA
MECH 3450	Fluid Power 2	3.0	4.0
MECH 3460	Engineering Economics (Term 4A) *	3.0	2.0
MECH 4420	Thermal Engineering 2 (Term 4A)*	4.0	TBA
MECH 4440	Machine Design 2	5.0	6.5
MECH 4450	Mechanical Control Systems (Term 4B)*	4.0	TBA
MECH 4490	Design Projects (Term 4B)*	5.0	TBA
MECH 4495	Engineering Design (Term 4A)*	4.0	TBA

MANUFACTURING OPTION

Second-year courses

Level 3 (15 weeks)

ELEX 2845	Electrical Equipment	4.0	4.0
MANU 3310	Material Removal Processes	5.0	5.0
MANU 3312	Computer Aided Manufacturing	4.0	4.0
MANU 3316	Advanced Materials	4.0	4.0
MECH 2350	Fluid Power 1	3.0	3.0
MANU 3314	Tool Design	5.0	5.0
OPMT 1182	Total Quality Management	5.0	5.0

Level 4 (20 weeks)

COMM 2449	Technical Communication	4.0	5.5
MANU 4410	Material Joining Processes (Term 4A)*	4.0	2.5
MANU 4412	Production Planning (Term 4B)*	4.0	2.5
MANU 4450	Automated Manufacturing (Term 4B)*	4.0	2.5
MANU 4490	Manufacturing Projects	3.0	4.0
MATH 4491	Statistics/Quality Control	4.0	5.5
MECH 3440	Mechanical Equipment (Term 4A)*	4.0	2.5
MECH 3450	Fluid Power 2	3.0	4.0
MANU 3410	Metrology	4.0	5.5
OPMT 1411	Production Management	4.0	5.5

SYSTEMS OPTION

Second-year Courses

Level 3 (15 weeks)

ELEX 2840	Instrumentation for Mechanical Systems/Plastics	5.0	5.0
MATH 3491	Numericals Methods	4.0	4.0
MECH 3320	Thermal Engineering 1	4.0	4.0
MECH 3325	Fluid Mechanics	4.0	4.0
MSYS 2380	Interpretation of Building Construction	4.0	4.0
MSYS 3380	Air Conditioning 1	3.0	3.0
MSYS 3384	Heating and Ventilating 1	4.0	4.0
MSYS 3388	Plumbing	3.0	3.0

Level 4 (20 weeks)

COMM 2449	Technical Communication	4.0	5.5
MECH 3440	Mechanical Equipment (Term 4A)*	4.0	2.5
MECH 3460	Engineering Economics (Term 4A)*	3.0	2.0
MSYS 4440	Mechanical Systems (Term 4B)*	4.0	2.5
MSYS 4460	Mechanical Estimating (Term 4B)*	4.0	2.5
MSYS 4465	Maintenance Management (Term 4B)*	4.0	2.5
MSYS 4480	Air Conditioning 2	6.0	8.0
MSYS 4484	Heating and Ventilating 2	4.0	5.5
MSYS 4488	Fire Protection (Term 4A)*	4.0	2.5
OPMT 1460	Industrial Engineering	4.0	5.5

ENGINEERING

PLASTICS TECHNOLOGY
Diploma Program

Plastics' unusual and wide ranging properties make it an ideal candidate for innovative new products. The program is designed to provide a solid background in the selection and application of plastic materials, the unique plastics processing technologies as well as the design and development of new products. The student receives practical hands-on training in a modern lab and manufacturing facility utilizing the latest in production scale equipment.

Job Opportunities
The plastics industry is relatively young worldwide and one of the fastest growing secondary manufacturing industries 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. A lack of well trained people together with exceptional growth has meant supervisory posts are assumed quite rapidly.

The Program
Emphasis is placed on plastics processes such as injection molding, extrusion, thermoforming, rotational molding, blow molding, 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.

Students participate in an industry-sponsored project (practicum or directed studies) in the second- year of the program. The industry project is an integral program component, which is required for completion and certification.

Program Length
Two years, full-time beginning in September each year.

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.

The program is in a process of "continuous improvement," thus the actual courses may vary from those shown.

Program: PLASTICS TECHNOLOGY

Level 1 (15 weeks)		hrs/wk	credits
CHEM 1120	General Chemistry for Plastics	4.0	4.0
COMM 1149	Technical Communication	4.0	4.0
MATH 1491	Technical Mathematics for Mechanical	5.0	5.0
MECH 1100	Engineering Graphics 1	3.0	3.0
MECH 1105	CAD Graphics 1	4.0	4.0
MECH 1140	Statics	4.0	4.0
MECH 1170	Computer Applications	3.0	3.0
PLAS 1110	Plastics Technology 1	4.0	4.0

Level 2 (20 weeks)			
CHEM 2220	Organic Chemistry for Plastics	4.0	5.5
CHSC 1262	Engineering Materials for Plastics Technology	3.0	4.0
MATH 2491	Calculus for Mechanical	4.0	5.5
MECH 1210	Manufacturing Processes	4.0	5.5
MECH 2200	Engineering Graphics 2	3.0	4.0
MECH 2240	Strength of Materials	4.0	6.0
PHYS 1162	Physics for Plastics Technology	4.0	5.5
PLAS 2210	Plastics Technology 2	4.0	5.5

Level 3 (15 weeks)		hrs/wk	credits
CHEM 3320	Polymer Chemistry and Technology	4.0	4.0
ELEX 2840	Instrumentation for Mechanical Systems/Plastics	5.0	5.0
MATH 3491	Numerical Methods	4.0	4.0
MECH 2350	Fluid Power 1	3.0	3.0
MECH 3340	Machine Design 1	4.0	4.0
PLAS 3310	Plastics Technology 3	7.0	7.0
PLAS 3340	Plastics Design	2.0	2.0
PLAS 3345	Injection Molding Analysis	2.0	2.0

Level 4 (20 weeks)			
COMM 2462	Technical Communication for Plastics	4.0	5.5
MATH 4491	Statistics/Quality Control	4.0	5.5
MECH 3450	Fluid Power 2	3.0	4.0
MECH 3460	Engineering Economics (Term 4A)*	3.0	2.0
OPMT 1411	Total Quality Management*	4.0	3.0
PLAS 3440	Fibre Reinforced Plastics	4.0	5.5
PLAS 4410	Plastics Technology 4	6.0	8.0
PLAS 4490	Plastics Project	6.0	5.5

*denotes half-term course

Course Descriptions
Many of the following courses require appropriate prerequisites. A prerequisite list is available from the department.

CDCM 2370 Programming in C — Introduces modern programming practices with emphasis on structured programming, modularization and the top-down approach to problem solving. C is used as the language for illustration. Students are taught to write programs that are readable, well structured and easy to maintain. Prerequisite: MECH 1170.

CDCM 2372 Database Systems — Introduces database systems including hierarchical, network and relational databases. Students receive hands-on experience with a commercial database application. Emphasis on engineering and geographic applications. Prerequisite: MECH 1170.

CDCM 3305 CAD Graphics 3 — Covers 2D and 3D graphics using Microstation software.

CDCM 3375 CAD Customization 1— Covers how 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 or CDCM 3500.

CDCM 3460 CAD/CAM System Management — Covers 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 Data Structures in C — Continues from CDCM 2370. Students create C programs to process complex engineering data using arrays, structures and lists. Search and sort techniques are studied Prerequisite: CDCM 2370.

CDCM 3472 CAD/Database Applications — Investigates the integration of non-graphic data with CAD drawing files. The course will cover internal and external storage of data, database integrity and management, creating and maintaining links between data, and the use of ASE, AutoCAD's Structured Query Language (SQL) environment. Prerequisite: CDCM 2372 and MECH 2205.

CDCM 4405 CAD Graphics 4 — Covers computer generation of 3D models using wireframe, surface and solids modeling software. The creation and generation of shaded models and animation for engineering applications. Prerequisite: MECH 2205 (concurrently) and MECH 3305.

CDCM 4470 File Processing in C — Continues from CDCM 3470. In this course, students design and utilize the file structures using sequential, direct and keyed indexed file access methods. Prerequisite: CDCM 3470.

CDCM 4475 CAD Customization 2 — Continues from CDCM 3375. This course deals with complex entities, error handling, dialogue box creation and programming, and ADS, AutoCAD's C language interface. Prerequisite: CDCM 2370 and 3375.

CDCM 4490 CAD/CAM Projects — Allows students to integrate skills in graphics, programming, databases and engineering technology and apply them to industrial purposes.

CHEM 1120 General Chemistry for Plastics — Reviews the 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 behaviour 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 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. Prerequisite: CHEM 1120.

CHEM 3320 Polymer Chemistry and Technology — Show how 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 behaviour. 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. Prerequisite: CHEM 2220.

CHSC 1105 Engineering Materials 1 — Covers 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 Engineering Materials for Plastics Technology — See CHSC 1105.

CHSC 2205 Engineering Materials 2 — Continues from CHSC 1105. Prerequisite: CHSC 1105.

COMM 1149 Technical Communication 1 — Teaches 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 2449 Technical Communication 2 for Mechanics — Applies 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 Advanced Technical Communication 2 for CAD/CAM — 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. Prerequisite: COMM 1149.

COMM 2462 Technical Communication 2 for Plastics — Allows students to 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.

ELEX 2835 Instrumentation for Mechanical — TBA. Prerequisite: MECH 1120.

ELEX 2840 Instrumentation for Mechanical Systems/Plastics — Includes 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 behaviour and controllability. On/off, proportional, integral and derivative control. Control strategy. Ratio, cascade, multivariable and feedforward systems. Introduction to computer control.

ELEX 2845 Electrical Equipment — Introduces industrial electrical equipment. Topics include AC and DC motors and their application to electromechanical 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.

MANU 3310 Material Removal Processes — Evaluates material removal processes 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.

MANU 3312 Computer Aided Manufacturing — Investigates programming and operating procedures of Computer Numerical Control (CNC) machine tools. 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 Tool Design — 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.

MANU 3316 Advanced Materials — Investigates non-traditional materials currently found in modern manufactured equipment. These include plastics and composites and their forming processes.

MANU 3318 CNC Programming — Investigates the operation and application of computer numerically controlled (CNC) machine tools to manufacturing industries. Programming of CNC milling machines and lathes using manual and Computer Aided Manufacturing (CAM) methods will be studied.

MANU 3410 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 4410 Material Joining Processes — Investigates methods of material joining including soldering, brazing and various welding processes. This course will give the students hands-on experience with these joining processes.

MANU 4412 Production Planning — Examines the relative merits of manufacturing processes. Process plans for manufactured parts requiring multiple processes will be developed. The economics of manufacturing processes will be analyzed.

MANU 4450 Automated Manufacturing — Investigates the techniques and equipment used in the automation of the manufacturing process. Robotics, automated part feeding mechanisms, programmable logic controllers (PLC's) and automated inspection techniques will be examined.

MANU 4490 Manufacturing Projects — Allows students to 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 1491 Basic Technical Mathematics for Mechanical — Introduces 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 2491 Calculus for Mechanical — Continues from the differential and integral calculus 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. Prerequisite: MATH 1491.

MATH 3491 Numerical Methods Mechanical — Introduces the application of numerical methods to engineering problems. 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. Prerequisite: MATH 2491.

MATH 4491 Statistics/Quality Control Mechanical — Emphasizes the application of basic statistical principles and techniques to industrial quality control. 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. Prerequisite: MATH 3491.

MATH 4602 Mathematics for CAD/CAM — Covers geometric modelling including cubic splines, bezier curves and surface patches; matrix approach to transformations; raster algorithms and techniques including curve generation, half toning and other special effects; kinematics and simulation; solid modelling; overview of finite element method; selected algorithms from cartography; interactive computer graphics concerns.

MECH 1100 Engineering Graphics 1 — Covers 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 Introduction to CAD Graphics — Introduces 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 1120 Introduction to Thermal Processes — Introduces heat and fluid processes, steam tables, first law of thermodynamics, basic steam power and refrigeration cycles.

MECH 1140 Statics — Covers 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 Computer Applications — Introduces 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 Manufacturing Processes — Covers 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 Engineering Graphics 2 — Covers 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 CAD Graphics 2 — Continues from MECH 1105. Advanced 2D drafting techniques, blocks, attributes, macro commands and menu customization. Introduction to 3D graphics modeling: wireframe, surface and solid models. Relationship of CAD software to other computer programs. Prerequisite: MECH 1105.

MECH 2240 Strength of Materials — Covers 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. Prerequisite: MECH 1140.

MECH 2245 Dynamics — Discusses 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 2350 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 3320 Thermal Engineering 1 — Covers the first and second law of thermodynamics. Steady and non-flow energy equations, specific heats of gases, vapour tables, gas and vapour processes. Carnot, Rankine and basic IC engine cycles. Air compressors. Heat transfer. Prerequisites: MECH 1120 and 2245.

MECH 3325 Fluid Mechanics — Includes the basic principles of fluid properties, energy losses, Reynold's number, Moody diagram, flow measuring devices, dynamics of flow lift and drag and fluid statics. Prerequisite: MECH 1140.

MECH 3340 Machine Design 1 — Introduces 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. Prerequisites: MECH 2240 and 2245.

MECH 3345 Computer Aided Engineering (CAE) — Covers Computer-Aided Engineering (CAE) analysis techniques such as 3D solid modelling, surface modelling and finite element methods (FEM). 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.

MECH 3440 Mechanical Equipment — Presents 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 3445 Theory of Mechanisms — Covers topics on motions of mechanisms such as cams, rollers, gears, linkages and quick-return mechanisms. Relationships among displacements, velocities, accelerations and forces are described and illustrated using vector polygons. Location of the instantaneous centre of rotation. Analysis and animation of linkages by the use of computer softwares.

MECH 3450 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 3460 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 Thermal Engineering 2 — Topics includes analysis and selection of heat exchange equipment; design of pressure vessels according to ASME codes; selection of components for steam piping systems; analysis of various heat recovery systems and plant energy management; and descriptions of various steam plant cycles and co-generation cycles. Prerequisite: MECH 3320.

MECH 4440 Machine Design 2 — Continues from MECH 3340, covering 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. Prerequisite: MECH 3340.

MECH 4450 Mechanical Control Systems — Presents descriptions of components in a programmable logic controller (PLC). Create ladder logic diagrams and use high-level softwares for programming a PLC. Selection of hardware components such as micro switches, proximity sensors and actuators. Study of DC motor characteristics and load requirements. Compares open and closed loop systems.

MECH 4490 Design Projects — Provides students the opportunity of developing engineering solutions to current industrial problems. Students work individually or in teams to analyze industry-sponsored projects and prepare solutions through drawings, calculations and design application software.

MECH 4495 Engineering Design — Describes and illustrates the Engineering Design process from concept to detailed design and presentation. The course covers design criteria, conceptual design techniques, evaluation of different design concepts, and detailed designs. Topics of Design for Automation, and Assembly and Manufacture will be introduced. Preparation of design documents such as technical specification, bid documents and detailed drawings.

MSYS 2380 Interpretation of Building Construction — Covers the principles of building construction in terms of materials and methods. Examines typical systems of wood frame, masonry, concrete and steel construction. Studies functional architectural design problems and presentation techniques.

MSYS 3380 Air Conditioning 1 — Covers the analysis of air conditioning load parameters and related psychometric processes that apply to residential and commercial systems and equipment. Analysis of the refrigeration cycle as applied to air conditioning and heat pump systems. Introduction to air conditioning systems design process.

MSYS 3384 Heating and Ventilating 1 — Presents a study of residential gas fired warm air heating systems; furnaces and components, distribution systems and air terminal devices, humidifiers, heat recovery, cooling systems. Outlines system design requirements and procedures. Introduces solid fuels and oil fired equipment, heat pumps, infrared heaters and alternate heat sources. Covers theory and application of heat transfer principles through structures for occupant comfort and heating load estimation.

MSYS 3388 Plumbing — Encompasses the basic practices and principles of plumbing system design in buildings as related to potable water distribution, sanitary waste collection and storm drainage as governed by the B.C. Plumbing Code. Fundamental engineering principles relating to the plumbing field are developed for graphics presentation, load/demand calculations, piping methods, and system component sizing. From Plumbing Code interpretation and the application of these principles to an assigned project the student will develop a solution for the plumbing services required.

MSYS 4440 Mechanical Systems — Continues from MECH 3440. The course addresses fields of application and operating principles of various systems or specialty items associated with mechanical systems installations. The course expands into such areas as WHMIS and piping specialties. The student is introduced to these topics through class work, plant tours and guest lectures/ demonstrations/seminars. Prerequisite: MECH 3440.

MSYS 4460 Mechanical Estimating — Covers basic theories and principles for organizing facts, measurement and pricing of mechanical systems in buildings. Reviews construction contracts, bidding procedures, change orders and construction reports. Applications are applied to elementary examples of work using sources for cost data and labour requirements.

MSYS 4465 Maintenance Management — Introduces 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 Air Conditioning 2 — Covers mechanical systems design practices for residential and commercial structures including fan selection, duct construction and sizing, air terminal devices, noise and vibration analysis. The course includes the study of single and multi-zone, variable volume, air/water and other common HVAC system configurations, equipment and zone control options. Site visits to local industry and HVAC projects are made during the course. Prerequisite: MSYS 3380.

MSYS 4484 Heating and Ventilating 2 — Studies basic commercial air heating and ventilating systems, air handling unit components, ductwork systems, air terminal devices and electric resistance heating. Covers hydronic heating systems; encompassing building zoning, piping systems, boilers, products of combustion removal, combustion and ventilation air, gaseous fuels, systems controls, with an overview of steam heat systems and fuel and energy cost estimating. Outlines systems design requirements and procedures. Prerequisite: MSYS 3384.

MSYS 4488 Fire Protection — Includes mechanical fire protection systems regulations and codes of practice; fire hazard classification; detection, alarm and communication systems, stand pipe and sprinkler systems for buildings. Applications will be applied to design assignments. Prerequisite: MECH 3325.

OPMT 1182 Total Quality Management — Focuses on continuous improvement, quality assurance and plant layout. QA will include concepts of quality and reliability, quality planning, ISO standards, QA in engineering, production and purchasing, documentation, auditing, and the human and legal aspects of QA.

OPMT 1411 Production Engineering Management — Emphasizes 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 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 Physics for Plastics Technology — 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 2149 Physics for Mechanical — Presents a general-level course covering the elements of wave motion, sound, light, basic electricity and magnetism.

PLAS 1110 Plastics Technology 1 — Introduces 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 Plastics Technology 2 — Introduces the 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 FPR fabrication are discussed. In general, the key features, advantages and disadvantages, and equipment used are presented. Laboratory assignments cover the operating procedures for each process.

PLAS 3310 Plastics Technology 3 — Presents a more in-depth presentation of injection molding, compression and rotational molding 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.

PLAS 3340 Plastics Design — Focuses on injection molds and part design, sizing of mold analyzed components as well as 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, metallurgy of dies and tooling are discussed. Prerequisite: PLAS 2210.

PLAS 3345 Injection Molding Analysis — Introduces the use of MOLDFLOW software on microcomputers for the simulation and analysis of plastic flow regimes in injection molds. The optimum prediction of mold design and 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.

PLAS 3440 Fibre Reinforced Plastics — Presents a general review of fibre reinforced manufacturing processes and an introduction to composites used in the aerospace industries, part design and structural analysis to meet strength requirements. Lab work includes resin systems, cure cycles, materials handling and safety; structural repair and finishing procedures as well as part construction, inspection, testing and structural bonding. Prerequisites: PLAS 3310 and CHEM 3320.

PLAS 4410 Plastics Technology 4 — Extends from PLAS 3310, presenting a more in-depth review of the extruder, film and pipe extrusion process, blow molding process, equipment, materials and operating characteristics. Basic machine and plant raw material handling systems are reviewed and also included is an introduction into job and part cost determination. Prerequisite: PLAS 3310.

PLAS 4490 Plastics Project — Allows students to 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.

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 can combine academic terms with salaried cooperative work terms. Students wanting to participate in the Co-op program must meet separate requirements in addition to the technology entrance requirements. These requirements are available from the Co-op 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

Graduates from the program may obtain an Engineering Degree by applying to the University of Victoria which has a bridging agreement with BCIT.

Accreditation

This program is recognized 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 may be given to those candidates who have completed the prerequisites, and an Industrial Education course, within the last three years.

The program is in a process of "continuous improvement," thus the actual courses may vary from those shown.

Program: ROBOTICS & AUTOMATION

Level 1 (September - January)

			hrs/wk	credits
COMM	1163	Technical Writing for Robotics	3.0	3.5
ELEX	1105	Circuit Analysis 1	6.0	7.0
ELEX	1115	Digital Techniques 1	5.0	5.0
ELEX	2125	"C" Programming	4.0	4.5
MATH	1341	Basic Technical Math for Robotics	6.0	7.0
MECH	1110	Production Processes 1	4.0	4.0
PHYS	1163	Physics for Robotics Technology	5.0	5.5

Level 2 (February - May)

ELEX	2105	Circuit Analysis 2	5.0	5.5
ELEX	2115	Digital Techniques 2	6.0	7.0
ELEX	2120	Electronic Circuits 1	6.0	7.0
MATH	2341	Calculus for Robotics	6.0	7.0
MECH	2210	Production Processes 2	4.0	4.5
PHYS	2163	Applied Physics for Robotics Technology	5.0	5.5

Level 3 (September - January)

			hrs/wk	credits
ELEX	3205	Data Acquisition and Signal Conditioning	6.0	7.0
MATH	3341	Transform Calculus for Robotics	4.0	4.5
MECH	2355	Fluid Power 1 (Robotics)	3.0	3.5
ROBT	3340	Robot Applications	7.0	8.0
ROBT	3350	Automation Equipment	5.0	5.5
ROBT	3355	Microprocessors/ Interfacing	6.0	7.0

Level 4 (February - May)

COMM	2463	Advanced Technical Writing/Robotics	3.0	3.5
ELEX	4335	Feedback Systems	7.0	8.0
ROBT	3415	Computer Integrated Manufacturing	5.0	5.5
MECH	3455	Fluid Power 2 (Robotics)	3.0	3.5
OPMT	1183	Industrial Engineering for Robotics	4.0	4.0
ROBT	4450	Robot Sensors	5.0	5.5
ROBT	4490	Robotics Project	4.0	4.5

Course Descriptions

Many of the following courses require appropriate prerequisites. A prerequisite list is available from the department.

COMM 1163 Technical Writing 1 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 2463 Technical Writing 2 for Robotics — Introduces students 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 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.

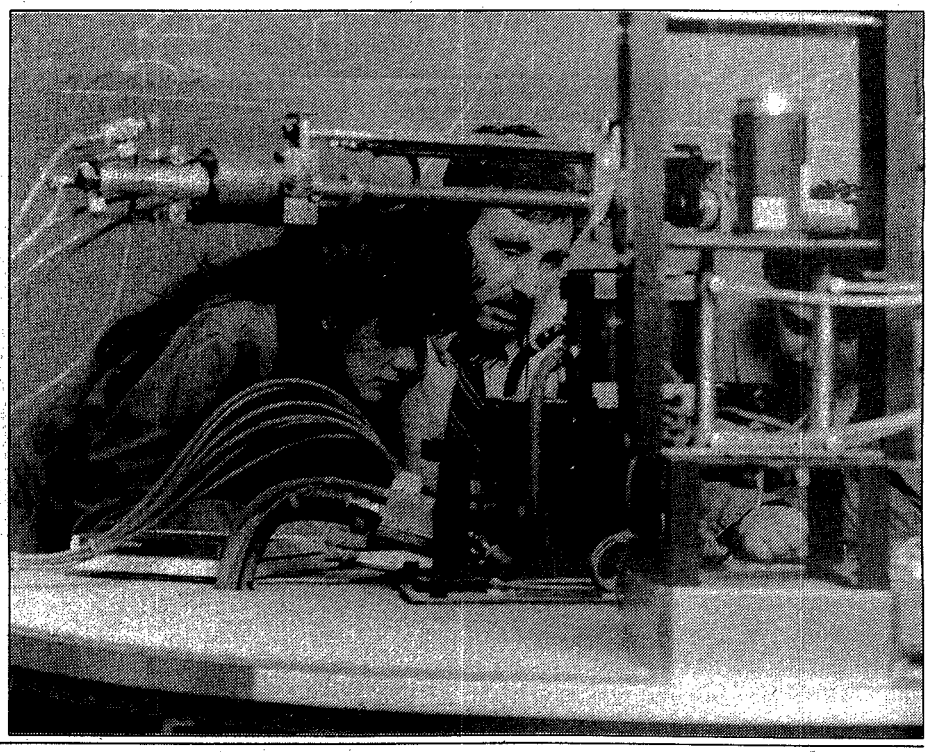
ELEX 1115 Digital Techniques 1 — Begins with a description of the fundamental theory of the decimal and binary number systems followed by the binary (two states or levels) concept and the description of binary variables as related to mechanical switches. Various digital logic circuits are discussed and their truth tables and Boolean output equations are generated. Various logic sources are defined and interfaced to combinational logic circuits composed of electronic logic gates. A TTL data book will be used 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 Circuit Analysis 2 — Introduces the behaviour 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. Prerequisites: ELEX 1105 and MATH 1431.

ELEX 2115 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. Prerequisites: ELEX 1115, ELEX 2120 (concurrently) and COMM 1143.

ELEX 2120 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. Prerequisites: ELEX 2105 (concurrently), MATH 1431 and (PHYS 1143 or 1163) and COMM 1143.

ELEX 2125 "C" Programming — Introduces 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.



ELEX 3205 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 two-wire current loop. A strong practical approach is ensured by relevant lab exercises and projects. Prerequisite: ELEX 2105, 2120 and MATH 2431.

ELEX 4335 Feedback Systems — Introduces 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 behaviour 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. Prerequisites: ELEX 3205, MATH 3341 and ROBT 3355.

MATH 1341 Basic Technical Math for Robotics — Covers 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 2341 Calculus for Robotics — Presents 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. Prerequisite: MATH 1341.

MATH 3341 Transform Calculus for Robotics — Presents 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. Prerequisite: MATH 2341.

MECH 1110 Production Processes 1 — Provides the student with practice in metal removal and metal joining and a study of related theory.

MECH 2210 Production Processes 2 — Covers 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. Prerequisite: MECH 1110.

MECH 2355 Fluid Power 1 (Robotics) — Provides 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 3455 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.

OPMT 1183 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.

PHYS 1163 Physics for Robotics 1 — 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 2163 Physics for Robotics 2 — 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.

ROBT 3340 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 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 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 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 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 Robotics Project — Allows students to 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.

INDUSTRIAL EDUCATION (TECHNOLOGY EDUCATION) TEACHER EDUCATION

The teacher education program for (Industrial) Technology Education (TTED) teachers is a cooperative affiliated program between BCIT and UBC which consists of three 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.**

When applying all applicants must indicate the program choice (Regular or Accelerated) and submit:

- Transcripts of post secondary university transfer courses
- Authorized copies of original technical certificate/diploma
- Two confidential letters of reference: one character reference and one technical reference. Letters of reference must include the phone number of the referee and be submitted in a sealed envelope with the referees signature across the flap.
- Resume

Regular Program Option: Diploma
The BCIT Regular program is open to graduates of secondary schools who do not have a Trade Certificate, Technology Diploma or equivalent. 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 secondary school technical courses or to applicants with some identifiable technical expertise and experience. Applicants may be requested to submit a portfolio detailing activities they have initiated and completed.

***Note:** TTED is currently under curriculum review. There may be adjustments to the courses listed below.

Program: TTED REGULAR

Level 1 (September - December) (15 weeks)

			hrs/wk	credits
TTED	3100	Teaching Design Drawing and CAD	16.0	6.0
TTED	3110	Teaching Precision Measurement	1.0	1.0
TTED	3120	Teaching Product Manufacturing	16.0	16.0
TTED	3140	Materials in Technology Ed 1	4.0	4.0
TTED	3170	Using Computers in Teaching 1	3.0	3.0

Level 2 (January - May) (20 weeks)

TTED	4200	Teaching Design Drawing and CAD	26.0	8.0
TTED	4240	Materials in Technology Ed 2	4.0	5.5
TTED	4250	Power and Energy for Technical Education	8.0	10.5
TTED	4260	Teaching Electronics 1	8.0	10.5
TTED	4270	Using Computers in Teaching 2	2.0	2.5

Level 3 (September - December) (15 weeks)

COMM	3394	Communications for TTED	2.0	2.0
MATH	5942	Basic Mathematics for TTED	2.0	2.0
TTED	5350	Teaching Automotive Systems 1	10.0	10.0
TTED	5360	Teaching Electronics 2	10.0	10.0
TTED	5370	Managing Computer Labs 1	2.0	2.0
TTED	5390	Introduction to Technology Education	4.0	4.0

ENGINEERING

Level 4 (January - May) (20 weeks)

			hrs/wk	credits
COMM	4494	Communication for TTED	2.0	2.5
MATH	5943	Basic Mathematics for TTED	2.0	2.5
TTED	5300	Teaching Design and CAD 3	3.0	4.0
TTED	5320	Teaching Metal Product Manufacturing	8.0	10.5
TTED	5330	Teaching Wood/ Composites Manufacturing	8.0	10.5
TTED	6470	Managing Computer Labs 2	2.0	2.5
TTED	6480	Technical Projects for Technology Education	4.0	5.5
TTED	6490	Technology Education Applications	4.0	5.5

Accelerated Program Option: Certificate
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. For applicants with 12 credits University transfer courses including six of English, 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 six 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.

The programs are in a process of "continuous improvement," thus the actual courses may vary from those shown.

Program: TTED ACCELERATED

Level 1 (September - December) (15 weeks)

			hrs/wk	credits
COMM	3394	Communications for TTED	2.0	2.0
MATH	5942	Basic Mathematics for TTED	2.0	2.0
TTED	3100	Teaching Design Drawing and CAD	16.0	6.0
TTED	3110	Teaching Precision Measurement	1.0	1.0
TTED	3120	Teaching Product Manufacturing 1	16.0	16.0
TTED	3140	Materials in Technology Education 1	4.0	4.0
TTED	3170	Using Computers in Teaching 1	3.0	3.0
TTED	5390	Introduction to Technology Education	4.0	4.0

Level 2 (January-May) (20 weeks)

			hrs/wk	credits
COMM	4494	Communications for TTED	2.0	2.5
MATH	5943	Basic Mathematics for TTED	2.0	2.5
TTED	4200	Teaching Design Drawing and CAD 2	6.0	8.0
TTED	4240	Materials in Technology Education 2	4.0	5.5
TTED	4250	Power and Energy for Technology Education	8.0	10.5
TTED	4260	Teaching Electronics 1	8.0	10.5
TTED	4270	Using Computers in Teaching 2	2.0	2.5
TTED	6490	Technology Education Applications	4.0	5.5

Course Descriptions

Many of the following courses require appropriate prerequisites. A prerequisite list is available from the department.

COMM 3394 Communication for TTED — Emphasizes practical communication skills for those in technical fields and "English Across the Curriculum" applications.

COMM 4494 Advanced Communications for TTED — Presents, in the second term, a course emphasizing practical communication skills for those in technical fields and "English Across the Curriculum" applications. Prerequisite: COMM 3394.

MATH 5942 Basic Technical Mathematics 1 for TTED — Covers skills necessary for teaching mechanical, electronics and technology courses at the secondary level.

MATH 5943 Basic Technical Mathematics 2 for TTED — Continues from MATH 5942. Topics include ratio, proportion percent; linear equations, quadratic equations, system of equations; problem solving, right triangle trigonometry, binary and hexadecimal number systems; computer logic.

TTED 3100 Teaching Design Drawing and CAD 1 — Presents 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 Teaching Precision Measurement — Allows students to develop the basic measuring skills required for success in the early parts of the program, with emphasis on teaching these skills to adolescent students.

TTED 3120 Teaching Product Manufacturing — Covers 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.

TTED 3140 Materials in Technology Ed 1 — Presents the study of materials commonly used in secondary school Industrial and Technology Education. Primarily concerned with the identification of materials by the properties which are unique to them, as well as the selection of appropriate materials for high school use. WHMIS regulations are studied in reference to the safe handling and disposal of hazardous materials which may be used in high school.

TTED 3170 Using Computers in Teaching 1 — Covers DOS operations and application programs useful in preparing lesson materials and managing a lab/shop.

TTED 4200 Teaching Design Drawing and CAD 2 — Covers 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 Materials in Technology Ed 2 — Continues to examine the properties of various materials suitable for use in high school Technology Education programs. The course emphasizes how the chemical and physical properties influence the selection of materials for the applications, the impact of these properties on fabrication techniques will also be examined. Prerequisites: TTED 3110, 3120 and 3140.

TTED 4250 Power and Energy for Tech Ed — Presents 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. Prerequisites: TTED 3110 and 3120.

TTED 4260 Teaching Electronics 1 — Presents the basic concepts of electronics, taught at the junior secondary level. Topics include 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.

TTED 4270 Using Computers in Teaching 2 — Presents DOS operations and application programs useful in preparing lesson materials and managing a lab/shop. Prerequisite: TTED 3170.

TTED 5300 Teaching Design Drawing and CAD 3 — Presents applied problems in design and drafting for technology education. Prerequisite: TTED 4200.

TTED 5320 Teaching Metal Product Manufacture — Covers 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 3120.

TTED 5330 Teaching Wood/Composites Manufacture — Covers the equipment, materials and skills necessary to teach wood and related materials at the senior secondary level. Management of large and mass-produced student projects. Prerequisite: TTED 3120.

TTED 5350 Teaching Automotive Systems 1 — Prepares students with the skills they need to master senior and career preparation, automotive shops, shop management, supervising student work on clients' cars. Prerequisite: TTED 4250.

TTED 5360 Teaching Electronics 2 — Teaches the concepts of electronics 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 Managing Computer Labs 1— Covers advanced computer applications including configuration of software for running various programs and peripherals. Prerequisite: TTED 4270.

TTED 5390 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 6470 Managing Computer Labs 2 — Covers advanced computer applications including troubleshooting and system configuration. Prerequisite: TTED 5370.

TTED 6480 Technical Projects for Tech Ed — Presents individual research projects that require 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. Prerequisite: TTED 3140.

TTED 6490 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 5390.

Faculty and Staff

T. Williams, B.Sc., M.Sc.(Mech Eng.), P.Eng., Associate Dean
E. Barry, B.Sc.
J. Bartz, Dipl.
G. Carrese, M.Eng.
P. Dollan, B.Sc.(Tech.)
G. Dramowicz, M.Sc.
B. Dunn, B.A.Sc, P.Eng.
B. Ennis, Dipl.
P. Esworthy, B.A.(Pol.Sci), B.Ed., Cert. IETE
D. Gerlitz, B.Sc., M.S.
A. Graham, H.N.C.
G. Henderson, Dipl.T., ASTT
E. Kulhanek, M.Sc., Program Head, Manufacturing
E. Labounty, Program Head, Mechanical Systems
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
E. Morse, B.Sc., B.Eng., P.Eng
K. Nikfetrat, Ph.D.
P. Paleologou, M.Eng. (Elec.)
J. Pretzlaff, Dipl.T.
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W. Shaw, B.Sc. (Mech), P.Eng.
R. Shultz, B.Ed., Cert. IETE.
J. Smith, B.A.Sc., P.Eng.
V. Strijack, B.Sc., P.Eng., Program Head, Common First-year Studies
G. Thiessen, Dipl.T.
P. Trant, B.Ed., M.A.
D. Wilson, Ph.D., Program Head, Plastics
K. Wong, B.A.Sc., M.A.Sc., P.Eng., Program Head, Design

Advisory Committee: Mechanical Technologies

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P. Callum, B.C. Comfort Air Conditioning Ltd.
J. Provan, University of Victoria
A. Tunningley, Voest Alpine Nortrak Ltd., Chair
P. Vatcher, Orion Engineering
G. Wegar, ASTT
G. Wilson, VTech Engineering

Advisory Committee: Plastics

W. Anderson, Plasco Manufacturing Ltd.
S. Brydon, Ministry of Employment & Investment
K. Chan, Seanix Technologies Inc.
R. Chin, Primex Manufacturing Ltd.
G. Defreitas, Defreitas Plastics Ltd.
D. Elder, Cowichan Secondary High School
K. Laidlaw, Sauder Industries Ltd.
S. Lam, Chemcor Industrial Plastics Inc.
D. Moore, Johnston Height Secondary
C. Russell, Novacor Chemicals Ltd.
D. Sabourin, ASI Plastics
T. Simmons, Vision Plastics
C. Stewart, Columbia Plastics
R. Thomson, Twinpak Inc.
N. Thornton, PCL Packaging
M. Vetterli, IPEX Pipe

Advisory Committee: Mechanical ADP

B. Acres, Sentinel Vision Inc.
D. Cherchas, University of British Columbia
D. Dark, Albacore Research
J. Dill, Simon Fraser University
J. Farges, Softac Systems, Chair
L. Hooton, Infrascan Inc.
R. Izdebsk, Emily Carr
T. Mitchell, International Telepresence Corp.

Advisory Committee: Industrial Education (Technology Education) Teacher Education

D. Eddy, Elgin Park Secondary, Chair
D. Fraser, Burnaby School District
J. Imrich, Prince George School District
B. Logan, University of British Columbia
D. Podetz, Frank Hurt Secondary
R. Russell, B.C. Technology Education Association
J. Sherrill, University of British Columbia
C. Ungerleider, University of British Columbia
TBA, Ministry of Education

ENGINEERING

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, 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.

Field Schools are an integral part of the mining curriculum. Field work, from one to seven days duration, reinforce academic studies in: mine planning, extractive metallurgy and assaying, geology and exploration, blasting, geomechanics and surveying.

Program Length
Two years, full-time beginning in September each year.

Degree Transfer/Completion
There are good transfer arrangements with several universities and approximately 50% 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

Level 1 (15 weeks)			hrs/wk	credits
CHEM	1102	Chemistry 1 for Mining/Petroleum	6.0	6.0
COMM	1135	Introduction to Technical Communication	3.0	3.0
MATH	1501	Basic Technical Mathematics for Mining	5.0	5.0
MINE	1101	Introductory Geology*	5.0	3.5
MINE	1102	Mining Exploration	2.0	2.0
MINE	1103	Introduction to Computers	1.0	1.0
MINE	1108	Graphical Communication	2.0	2.0
PHYS	1147	Physics for Mining/ Petroleum 1	6.0	6.0
SURV	1140	Surveying for Mining 1	3.0	3.0

Level 2 (20 weeks)			hrs/wk	credits
CHEM	2202	Chemistry 2 for Mining/Petroleum	6.0	8.0
COMM	2250	Technical Communication for Mining	3.0	4.0
MATH	2501	Calculus for Mining	5.0	6.5
MINE	2101	Geomorphology	4.0	5.5
MINE	2102	Mining Methods	2.0	2.5
MINE	2108	Mine Drafting and Computer Graphics	2.0	2.5
PHYS	2147	Physics for Mining/ Petroleum 2	6.0	8.0
SURV	2240	Surveying for Mining 2	3.0	4.0

Level 3 (15 weeks)				
CHSC	3305	Assaying	4.0	4.0
CHSC	3314	Mineral Processing*	5.0	3.5
CIVL	1220	Statics and Strength of Materials	3.0	3.0
COMM	3350	Advanced Technical Communication for Mining	2.0	2.0
MATH	3501	Numerical Methods and Computing	5.0	5.0
MINE	3101	Structural Geology*	5.0	3.5
MINE	3102	Blasting and Rock Mechanics	4.0	4.0
PHYS	3150	Mining Geophysics	3.0	3.0
SURV	3340	Surveying for Mining 3	3.0	3.0

Level 4 (20 weeks)				
CHSC	4405	Assaying 2	4.0	5.5
CHSC	4414	Mineral Processing	3.5	4.5
CIVL	2221	Strength of Materials*	3.0	2.0
CIVL	2222	Geotechnical for Mining*	3.0	2.0
CIVL	2223	Hydraulics	3.0	4.0
COMM	4450	Advanced Technical Communication for Mining	2.0	2.5
MATH	4501	Numerical Methods/ Statistics	5.0	6.5
MINE	4101	Geology: Mineral Deposits*	5.0	4.5
MINE	4102	Mine Planning	4.0	5.5
SURV	4440	Surveying for Mining 4	3.0	4.5

*denotes half-time course

ENGINEERING

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 — Continues from 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. Prerequisite: CHEM 1102.

CHSC 3305 (CHSC 305) Assaying — Presents 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 1 — 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 — Continues from CHSC 3305. Also, environmental chemistry, acid generating potential. Prerequisite: CHSC 3305.

CHSC 4414 (CHSC 414) Mineral Processing 2 — Continues from CHSC 3314. Prerequisite: CHSC 3314.

CIVL 1220 (CIVL 339) Statics and Strength of Materials — Presents the definitions, representations and uses of forces and moments, leading to the equations of equilibrium. Topics include free bodies, trusses, stresses, shear and bending moment diagrams.

CIVL 2221 (CIVL 443) Strength of Materials — Covers 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; and 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.

CIVL 2222 (CIVIL 444) Geotechnical for Mining — Presents a study of environmental aspects of tailings dam disposal, quantity takeoff for feasibility and pond life. Optimization of pond sites. Long-term 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 — Covers properties of fluids, hydrostatics, pressure and centre of pressures; fluid flow, continuity equation, velocity head, and Venturi meters; pipe friction and flow; flow conditions; open channel flow in flumes and streams; flow measurement; lab demonstrations; and pumps. Prerequisite: CIVL 1220.

COMM 1135 (TCOM 101) Technical Communication 1 — 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 2 for Mining — 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 3 for Mining — 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 2250.

COMM 4450 (TCOM 404) Advanced Technical Communication 4 for Mining — Allows students to 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 3350.

MATH 1501 (MATH 150) Basic Technical Mathematics for Mining — Covers 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 — Covers 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 — Uses Microsoft Quick BASIC to solve selected problems related to the Mining Technology. The next part of the course will be used to introduce critical path scheduling and levelling of resources. The last topic is the Hardy cross for analyzing nonlinear flow distribution of fluids.

MATH 4501 (MATH 450) Numerical Methods/Statistics — Introduces 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. Prerequisite: MATH 3501.

MINE 1101 (MINE 101) Introductory Geology — Presents a systematic introduction to the materials, processes and origins of the major classes of igneous, sedimentary and metamorphic rock is provided. This includes the origin of Earth and deformation in the crust. The dependence of geology on other scientific disciplines is demonstrated and the distinction between reliable and conjectural concepts is emphasized. The geological evolution of B.C. is described. Laboratory work concentrates on the field identification of rocks and minerals.

MINE 1102 (MINE 102) Mining Exploration — Introduces mining generally and, more particularly, mining exploration. Ten hours on identifying the factors important to mine profitability; 20 hours. giving a unified picture of modern prospecting techniques: geochemistry, geology, geophysics, sampling and diamond drilling, maps, airphotos, 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 — Teaches students 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) Geomorphology — Uses a raw material, process-product approach is used to describe the operation and interaction of the numerous processes that contribute to the landscape we see today. The systems examined extend from weathering and soil formation through to glaciation and beaches. At every opportunity, the human interaction is considered and the long-term outcome in terms of humans and the Earth is discussed. Laboratory work consists of the study of examples of landforms from British Columbia using stereo-paired aerial photographs.

MINE 2102 (MINE 202) Mining Methods — Presents a full description of mining methods with brief subjective descriptions of rock mechanics, fragmentation and mine services. Unit operations of drilling, blasting, loading and hauling are discussed in the context of organization, equipment, labour 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. Prerequisite: MINE 1108.

MINE 3101 (MINE 301) Structural Geology — Reviews Metamorphic Geology, emphasizing the way rocks respond to strain at the scale of the crystal. This leads into a descriptive analysis of the deformation of primary structures by earth processes resulting in folds, faults, joints, cleavage and shear zones. Laboratory work consists of simple exercises in the graphical solution of 3D problems in deformed layered rocks. Rock exposures are visited to collect data for an introduction to stereographic procedures. Prerequisite: MINE 1101.

MINE 3102 (MINE 302) Blasting and Rock Mechanics — Covers blasting products, initiation systems, underground and opencast applications and design, control blasting, safety and 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, slope design) and ground movement monitoring.

MINE 4101 (MINE 401) Mineral Deposits — Defines the information required to explain a mineral deposit and the extent to which such information exists is examined. The evidence for all likely processes is discussed and all deterministic theories are considered. In the second part, the various major types of orebody are described, and examples are studied in the laboratory exercises. A selection of the British Columbia deposits are visited in two field trips. Prerequisite: MINE 3101.

MINE 4102 (MINE 402) Mine Planning — Covers 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.

PHYS 1147 (PHYS 101) Physics for Mining/ Petroleum 1 — Covers basic concepts and calculations in the mechanics of particles, solids and fluids that 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 — Covers thermal properties of matter, waves, electricity, magnetism, electromagnetism and atomic and nuclear physics. The lab component is comprised of experiments to complement the lectures. 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 — Covers 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 — Continues from SURV 1140. The content is the same. Prerequisite: SURV 1140.

SURV 3340 (SURV 340) Surveying for Mining 3 — Presents 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. Prerequisite: SURV 2240.

SURV 4440 (SURV 440) Surveying for Mining 4 — Continues from SURV 3340. The content is the same. Prerequisite: SURV 3340.

Faculty and Staff

Keith Errington, B.C.L.S., Acting 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: Mining

R. Halbauer, Teck Mining Group Ltd.
D. Bohme, INCO Exploration & Technical Services Inc.
D. Jennings, Quartz Mountain Gold Corporation
A.J. Keen, Cominco Ltd.
M. Lipkewich, Mining Association of B.C.
J. Meech, University of British Columbia
J.C. O'Rourke, Placer Dome Inc.
J. Patterson, B.C. Yukon Chamber of Mines
D. St. Clair Dunn, Pioneer Metals Inc.
D.W. Philip, DW Philip Mining Services

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, and evaluation of oil and gas properties.

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 behaviour, 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.

Students participate in an industry-sponsored project (practicum or directed studies) in the second year of the program.

The industry project is an integral program component, which is required for completion and certification. Students may be required to participate in work experience activities at the industry sponsor's regular place of business.

Program Length

Two years, full-time beginning in September each year.

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.

ENGINEERING

Program: PETROLEUM AND NATURAL GAS

Level 1 (15 weeks)

			hrs/wk	credits
CHEM	1102	Chemistry 1 for Mining/Petroleum	6.0	6.0
CHSC	1106	Engineering Materials Petroleum*	4.0	3.5
COMM	1135	Technical Communication 1	3.0	3.0
MATH	1471	Basic Technical Mathematics for Petroleum	5.0	5.0
PETR	1101	Petroleum Geology	4.0	4.0
PETR	1102	Properties of Reservoir Fluids	3.0	3.0
PHYS	1147	Physics for Mining/ Petroleum 1	6.0	6.0

Level 2 (20 weeks)

CHEM	2202	Chemistry 2 for Mining/Petroleum	6.0	8.0
COMM	2247	Technical Communication 2 for Petroleum	3.0	4.0
COMP	1135	Computer Applications	2.0	2.5
MATH	2471	Calculus for Petroleum	5.0	6.5
PETR	2201	Field Production of Oil and Gas	3.0	4.0
PETR	2202	Field Handling of Oil and Gas/ Gas Processing	2.0	2.5
PHYS	2147	Physics for Mining/ Petroleum 2	6.0	8.0
SURV	1128	Surveying for Petroleum	3.0	4.0

Level 3 (15 weeks)

CHSC	3341	Unit Operations 1	6.0	6.0
CHSC	3351	Pollution Control	3.0	3.0
MATH	3471	Differential Equations or Petroleum	5.0	5.0
PETR	1308	Fuels	2.0	2.0
PETR	3306	Reservoir Evaluation	4.0	4.0
PETR	3307	Pipeline Transmission	6.0	6.0
PETR	3xxx	Integrated Business Computer Applications	3.0	3.0
PETR	3xxx	Petroleum Technology Sketching	2.0	2.0

Level 4 (20 weeks)

			hrs/wk	credits
CHEM	4415	Petroleum Chemistry	5.0	6.5
CHSC	4441	Unit Operations 2	6.0	8.0
MATH	4471	Statistics and Numerical Methods for Petroleum	5.0	6.5
PETR	2404	Computer Simulation and Control	2.0	2.5
PETR	4403	Process Dynamics	3.0	4.0
PETR	4406	Gas Processing & Oil Refining	5.0	6.5
PETR	4407	Gas Distribution/ Utilization	4.0	5.5

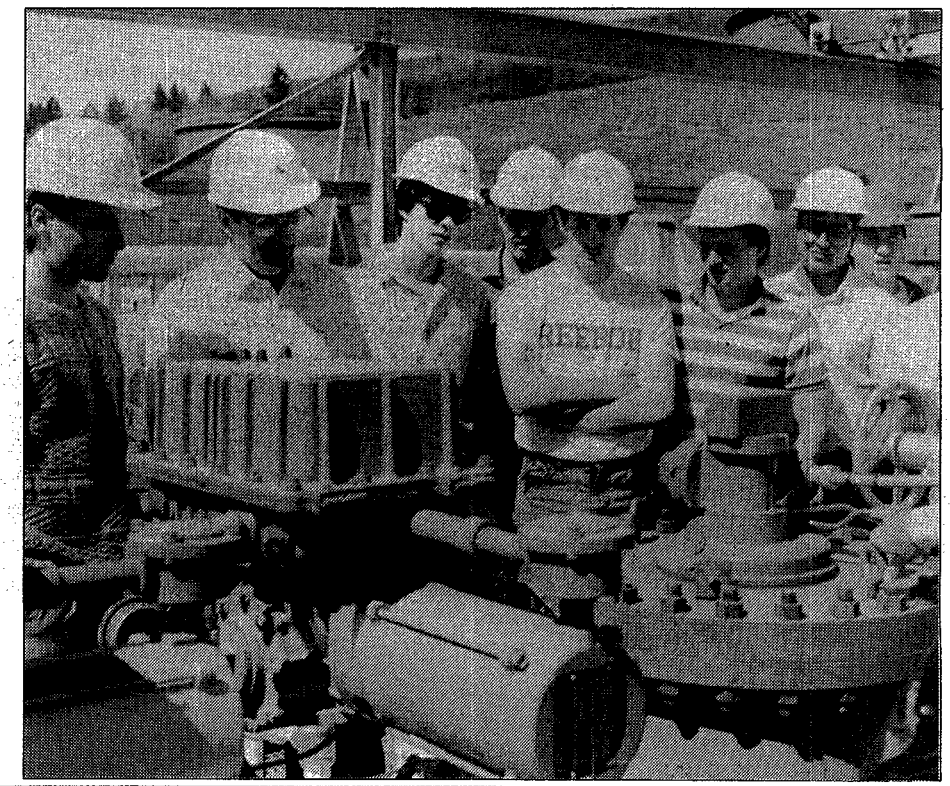
*denotes half-term course

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 teaches good lab technique, and consists of simple qualitative and quantitative analysis.

CHEM 2202 (CHEM 201) Chemistry 2 for Mining/Petroleum — Continues from 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 4415 (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 petrochemicals 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, behaviour 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 — Introduces chemical engineering. Topics include transportation of fluids, thermodynamics, heat transfer, evaporation, distillation, liquid/liquid extraction, solid/liquid extraction, gas absorption and 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. Prerequisite: CHSC 3341.

COMM 1135 (TCOM 101) Technical Communication 1 — Teaches 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 2 (Petroleum) — Continues from 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 — Introduces 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 — Covers 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 — Covers 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 — Covers 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 — Presents 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 behaviour 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 or with department approval.

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, sulphur recovery, dehydration and natural gas liquids recovery. A technical report with oral presentation is required. Prerequisite: PETR 1102 or with department approval.

PETR 2404 (PETR 404) Computer Simulation and Control — Presents 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.

PETR 3306 (PETR 306) Reservoir Evaluation — Presents an advanced course in the application of reservoir fluids, production and processing of oil and gas. The first half of the course provides the students with the methods of estimating oil and gas reserves, and costs associated with obtaining and producing such reserves. The second half of the course translates the production rates and costs to present worth value and profitability of an oil and gas property. The students are required the evaluate three oil and gas properties as the final project. Prerequisites: PETR 2201 and 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 and 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 or with department approval.

PETR 3XXX Integrated Business Computer Applications — Introduces the capabilities and use of an integrated business software package. Emphasis will be on the handling, manipulation and effective presentation of petroleum-related engineering data in a business environment. Assignments will include written assignments and audio/visual presentations utilizing computer generated enhancements. Prerequisites: COMP 1135, PETR 2201 and 2202 or with department approval.

PETR 3XXX Petroleum Technology Sketching — Introduces process flow sheets of gas processing plants, piping and instrumentation drawings of pressure vessels, inlet heaters and valving. Prepare material lists and specify materials in accordance with Canadian Standards. Prerequisites: PETR 2211 and 2202 or with department approval.

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 and MATH 2471 or equivalent or with department approval.

PETR 4406 (PETR 402) Natural Gas Processing and Oil Refining — Deals with some of the fundamental concepts of sweet and sour natural gas processing. It is intended to give the student an understanding of designing wellhead facilities to process both sweet and sour natural gas by dehydration, processing and treating so that the gas will meet both water and hydrocarbon dew-point control specifications for pipeline transmission. The second part of the course deals with refinery processing and testing of the products as per ASTM specifications. Prerequisite: PETR 3306.

PETR 4407 (PETR 401) Gas Distribution and Utilization — Introduces 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 or with department approval.

PHYS 1147 (PHYS 101) Physics for Mining/Petroleum 1 — Presents basic concepts and calculations in the mechanics of particles, solids and fluids that 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 — Covers thermal properties of matter, waves, electricity, magnetism, electromagnetism and atomic and nuclear physics. The lab component is composed of experiments to complement the lectures. Prerequisite: PHYS 1147.

SURV 1128 (SURV 128) Surveying for Petroleum — Familiarizes students with the instruments and fundamental field and computational procedures that 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

Keith Errington, B.C.L.S.,
Acting Associate Dean
R. Kinney, Dipl.T., A.Sc.T., Program Head
J. Yu, B.Sc., P.Eng.

Advisory Committee Members: Petroleum & Natural Gas

M. Bruce, BC Gas Inc.
B. Burton, Centra Gas
T. Davies, A.H. McElroy Sales & Service Canada Ltd.
G. Farr, Ministry of Energy, Mines & Petroleum Resources
C. Fraser, B.C. Gas Utility Ltd.
M. Horner, Trans Mountain Pipe Line Co.
M. Kelly, Westcoast Energy Inc.
L. O'Hara, Trans Mountain Pipe Line Co.
I.E. Sellars, BC Gas Utility Ltd.

ENGINEERING

RENEWABLE RESOURCES
Cooperative Diploma Program

British Columbia's greatest natural renewable resource is its forest land. The benefits that 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.**

Due to ongoing changes in Resource Management, course content is being revised on an ongoing basis. Students should anticipate minor changes to the program outlined in the following pages.

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 in either program will reflect the probability of employment opportunities.

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 (FWR) covers the management of fish, wildlife and wildland recreation and includes habitat ecology, environmental inventory techniques and environmental law with respect to these resources.

As part of the fieldwork required in the two-year programs, you will be expected to work independently, or as a member of a crew, in a wide variety of terrain and weather conditions. You will be expected to wear raingear, approved footwear, and required to wear other appropriate field clothing.

When course credits are given, electives must be selected in consultation with the Program Head. Subject to availability of seats, admission to Renewable Resources Technology courses will be limited to students registered in the program.

Students participate in an industry-sponsored project (practicum or directed studies) in the second year of the program.

The industry project is an integral program component, which is required for completion and certification. Students may be required to participate in work experience activities at the industry sponsor's regular place of business.

Cooperative Education Option

Renewable Resources has a Cooperative Education Program Option available for both the Forestry and Fish, Wildlife and Recreation programs. Cooperative Education involves enhancing the educational experience by integrating traditional academic studies with relevant work experience. The benefits of participation in the program will include skill development in a workplace environment and the potential enhancement of employment opportunities upon graduation. It is expected that the Co-op experience will provide participants with training in tune with the specific needs of employers.

Those wishing to enter this option must achieve a 65% grade point average for their Level 1 courses with no failures. The Co-op program option requires students to complete 2 or 3 Work Terms and undergo additional academic studies to obtain an enhanced Co-op Diploma in their discipline.

Students interested in Co-op should approach their respective program heads for more information.

Accreditation

The program is accredited at the technologist level by the Applied Science Technologists and Technicians of B.C.

Prerequisites: Forestry Option

High school graduation with English 12, Math 11 with a C+, and any two science 11 or 12 courses with a preference for at least one science 12 and grades of C+ or better. Math 12 may be considered in lieu of one of the science 12 courses.

A one page letter, preferably hand written, should be included with your application. The letter should describe why you desire a career in the field of Forestry.

Appropriate work experience in the field of Resource Management may exempt a limited number of applicants from some academic prerequisites. Applicants who feel they fall into this category should include a detailed resume with their application and letter.

Prerequisites: Fish, Wildlife, and Recreation Option

High school graduation with Math 11 with a C+, English 12, Biology 11 and one other science 11 or science 12. Chemistry is recommended. A resume must accompany application. Relevant work experience in natural resources strengthens an application.

Program Length

Two years, full-time beginning in September each year.

Cooperative Education Program Option requires additional academic term.

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 (15 weeks)		hrs/wk	credits
COMM 1145	Technical Communication 1 for Renewable Resources	4.0	4.0
MATH 1451	Basic Technical Mathematics for Renewable Resources	5.0	5.0
RENR 1100	Enhanced Learning Skills*	8.0	0.5
RENR 1105	Natural Resource Measurement 1	5.0	5.0
RENR 1110	Microcomputer Applications (Forestry)	3.0	3.0
RENR 1115	Applied Ecology in B.C. 1	5.0	5.0
RENR 1120	Photo Interpretation and Mapping 1	4.0	4.0
RENR 1125	Plant Identification	5.0	5.0

ENGINEERING

Level 2 (20 weeks)		hrs/wk	credits
COMM 2245	Technical Communication 2 for Forestry	3.0	3.0
MATH 2451	Statistics for Renewable Resources	5.0	5.5
RENR 2106	Natural Resource Measurements 2 Theory	3.0	3.0
RENR 2107	Natural Resource Measurements 2 Practical	4.0	4.0
RENR 2115	Applied Ecology in B.C. 2	5.0	5.0
RENR 2120	Photo Interpretation and Mapping 2	5.0	4.0
RENR 2130	Introduction to Soils	4.0	4.5
RENR 2135	Fire Management 1 (Forestry)	3.0	3.0

Level 3 (15 weeks)

COMM 3345	Technical Communication 3 for Forestry Resources	2.0	2.0
RENR 2155	Forest Management 1	4.0	4.0
RENR 3106	Natural Resource Measurements 3 Theory	3.0	3.0
RENR 3107	Natural Resource Measurements 3 Practical	4.0	4.0
RENR 3135	Fire Management 2 (Forestry)	3.0	3.0
RENR 3145	Silviculture 1*	4.0	3.5
RENR 3150	Forest Pestology 1*	4.0	3.5
RENR 3160	Forest Engineering 1	8.0	8.0
RENR 3180	Technical Project 1 (Forestry)*	2.0	1.0

Level 4 (20 weeks)		hrs/wk	credits
COMM 4445	Technical Communication 4 for Forestry Resources	2.0	2.0
RENR 2170	Log Scaling (for 8 weeks)*	9.0	5.0
RENR 3155	Forest Management 2 (for 9 weeks)*	7.0	4.0
RENR 3165	GIS (for 9 weeks)*	5.0	3.0
RENR 3175	Independent Studies*(a 2-week course)	30.0	4.0
RENR 3181	Technical Project 2 (Forestry)	2.0	2.0
RENR 4145	Silviculture 2	7.0	7.0
RENR 4150	Forest Pestology 2	5.0	5.0
RENR 4160	Forest Engineering 2	8.0	8.0

Program: FISH, WILDLIFE AND RECREATION

Level 1 (15 weeks)

COMM 1145	Introduction to Technical Communications	4.0	4.0
MATH 1451	Basic Technical Mathematics for Renewable Resources	5.0	5.0
RENR 1100	Enhanced Learning Skills*	8.0	0.5
RENR 1105	Natural Resource Measurements	5.0	5.0
RENR 1115	Applied Ecology in B.C. 1	5.0	5.0
RENR 1120	Photo Interpretation and Mapping 1	4.0	4.0
RENR 1125	Plant Identification	5.0	5.0
RENR 1200	Microcomputer Applications for FWR	3.0	3.0

Level 2 (20 weeks)		hrs/wk	credits
COMM 2253	Technical Communication 2 in FWR	4.0	4.5
FOOD 2240	Zoology	4.0	4.0
MATH 2452	Statistics for FWR	6.0	6.5
RENR 2115	Applied Ecology in B.C. 2	5.0	5.0
RENR 2130	Introduction to Soils	4.0	4.5
RENR 2190	Environmental Monitoring	3.0	3.0
RENR 2205	Photo Interpretation and Mapping 2	3.0	3.0
RENR 2210	GIS for FWR	3.0	3.0

Level 3 (15 weeks)

COMM 3353	Advanced Technical Communication FWR	2.0	2.0
RENR 2245	Fire Management	3.0	3.0
RENR 3215	Recreational Land Management 1	7.0	7.0
RENR 3220	Wildlife Management 1	7.0	7.0
RENR 3225	Fish Management 1	6.0	6.0
RENR 3230	Projects 1 FWR	6.0	6.0

Level 4 (20 weeks)

COMM 4453	Public Information Techniques for FWR	3.0	3.5
RENR 2240	Environmental Law Enforcement	3.0	3.5
RENR 3175	Independent Studies (2 week course)	30.0	4.0
RENR 4215	Recreational Land Management 2	7.0	8.5
RENR 4220	Wildlife Management 2	7.0	8.5
RENR 4225	Fish Management 2	7.0	8.5
RENR 4230	Projects 2 FWR	5.0	6.0

*denotes half-term course

Option: COOPERATIVE EDUCATION - Forestry Program and Fish, Wildlife and Recreation Program

RENR 2990	Co-op Work Term 1	15.0
RENR 3990	Co-op Work Term 2	15.0
RENR 4990	Co-op Work Term 3	15.0
RENR 55**	Co-op Completion Courses	5.0

* Under ongoing revision.

Course Descriptions

COMM 1145 (TCOM 116) Technical Communication 1 for RENR — 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 2 Forestry — Teaches Forestry students professional writing skills as applied to memos 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 2 FWR — Teaches Fish, Wildlife and Recreation students professional writing skills as applied in memos 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 3 for Forestry — Allows students to 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 for Fish, Wildlife and Recreation — Allows students to apply communication skills to industry projects. They write proposals, meet with clients, report on progress, and practice oral communication and telephone skills. They also design, write, illustrate and produce a slide-tape or multimedia presentation on a Fish, Wildlife and Recreation topic. Prerequisite: COMM 1145 and 2245 or 2253.

COMM 4445 (TCOM 402) Advanced Technical Communication 4 for Forestry — Allows students to 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 — Allows students to study and practice techniques for communicating with the public and media about FWR issues. They write a public relations plan and promotional materials such as press releases, brochures and materials for interpretive educational program. Students design and construct visual displays and give community briefings on controversial issues in FWR. Prerequisite: COMM 1145 and 2245 or 3345 or 3353.

FOOD 2240 (BISC 204) Zoology FWR — Presents a 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. Prerequisite: Completion of Level 1.

MATH 1451 (MATH 145) Basic Technical Mathematics for Renewable Resources — Covers 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 2451 (MATH 245) Statistics for Forestry — Covers 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. Prerequisite: MATH 1451.

MATH 2452 (MATH 254) Statistics for Fish, Wildlife and Recreation — Presents 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 Measurements 1 — Presents concepts of field measurement and basic surveying. Includes field note-taking, traverse calculations and plotting, sketching and mapping of topographic detail, horizontal and vertical measurement error corrections, differential leveling of roads and streams, latitude and departure calculations and mapping of traverses, measuring tree heights and calculating volume, browse surveys for wildlife and an introduction to defect in trees. Emphasis is on field labs with supporting lectures.

RENR 1110 (RENR 106) Microcomputer Applications (Forestry option) — Introduces various computer applications in resource management. The course includes a review of computer hardware, software and operating systems. Assignments from other program courses will be used to introduce students to general work processing, spreadsheet, database management and file management skills. Students will also prepare two short reports, the first involving the integration of word processor and spreadsheet tools to present statistical information, the second involving a summary of several journal articles related to the use of computers in resource management.

RENR 1115 (RENR 108) Applied Ecology in B.C. 1 — Provides basic background material on the physiographic land regions of B.C. and their climates. Introduces forests, grasslands, streams, lakes and estuaries as ecosystems. Describes ecosystem components their work and interdependence in both terrestrial and aquatic ecosystems, the changing pattern of ecosystem structure in succession and its influence on ecosystem function. The course identifies common

herbivores, carnivores and salmonids, describes the characteristic features of their habitats, and where available, details their critical requirements. Prerequisite: Admission to Renewable Resources Technology.

RENR 1120 (RENR 104) Photo Interpretation and Mapping — Presents the 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. Students will also be introduced to basic CAD principles using Microstation. Continues in RENR 2120.

RENR 1125 (103) Plant Identification — Presents 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 for Fish, Wildlife and Recreation — Enables the first-time computer user to become familiar with computer hardware and application software. Emphasis is on building skills that will serve the student in other courses in the program and in future employment. Technology-related applications are used to help the students develop competence in word processing, spreadsheets, graphics, databases, and the integration of these elements to produce practical work.

RENR 2106 Natural Resource Measurements 2 (Theory) — Introduces the principles and concepts fundamental to the practical application of planning and operational natural resource measurement techniques. This theory component is complementary to RENR 2107 which is the practical application of principles and concepts of RENR 2106. Prerequisites: COMM 1145, MATH 1451, RENR 1105, 1115, 1120 and RENR 1125; or instructor's approval.

RENR 2107 Natural Resource Measurements 2 (Practical) — Introduces measurement and sampling procedures and techniques common to national natural resource needs and specific to British Columbia needs. The course introduces, within a planning and operational framework, direct tree measurements, coarse woody debris and wildlife tree measurements, topographic mapping, as well as provincial inventory and provincial valuation measurement requirements. Fixed area, variable plot, and line transect sampling systems are introduced and practiced. Sample design and basic statistical analysis in a measurements context are introduced. Prerequisites: COMM 1145, MATH 1451, RENR 1105, 1115, 1120, and 1125; or instructor's approval.

RENR 2115 (RENR 203) Applied Ecology in B.C. 2 — Introduces the basic concepts, objectives and the applications of several resource classification schemes used in B.C. The main focus of the course, however, is the biogeoclimatic ecosystem classification of B.C. and its application in resource management. Data collecting in the field and the interpretation of the data for the identification and management of ecosystems are emphasized. Management interpretations are derived both at biogeoclimatic unit and site series levels. Site series level interpretation include the selection of suitable silvicultural systems, tree species, identifying susceptibility to erosion and fire and uses by wildlife as described in the field guides of the B.C. Ministry of Forest and published material by other resource management agencies. Prerequisites: RENR 1105, 1115, 1125.

RENR 2120 (RENR 204) Photo Interpretation and Mapping 2 — Continues from RENR 1120, with an emphasis on interpreting surficial materials and vegetation identification. Students will transfer aerial photo information to a digital format using monorestitution software. Prerequisite: RENR 1120, and MATH 1451 or 1452; or instructor's approval.

RENR 2130 (RENR 202) Introduction to Soils — Gives students the basic knowledge of soils needed to work in forestry and other natural resource fields. The course is based on and includes a study of physical, chemical and biological properties of soils. Pedological soil classification (with emphasis on the Canadian System of Soil Classification), humus form classification, engineering classification of soils and the B.C. Terrain Classification System are surveyed and examples studies in some detail. Principles of soil survey and the interpretation of technical reports and maps (including terrain and geological hazard maps) are covered. Students will learn the basics of how to describe and sample soils for various purposes. Special topics include wildland hydrology; fertilizers; soil conservation; soil erosion and degradation; soils and old growth forests; soil geography; soils and the B.C. Forest Practices Code. Prerequisites: RENR 1105, 1110, 1120, 1110, MATH 1451 or instructor's approval.

RENR 2135 (RENR 205) Fire Management (Forestry) — Focuses on forest fire prevention, preparedness, detection and the reporting and extinguishing of small and medium size forest fires. Main topics include: Use of Fire Weather Index, Use of Weather Information, Safe Operation of Common Fire Control Equipment, Fire Line Organization and Supervision, Acts and Regulations, Fire Behaviour, Basic Fire Ecology. Wildland/Urban Interface and other related topics. Fire simulation is used to develop and exercise skills in decision-making, planning, assessment, communications and supervision. Prerequisites: RENR 1105, 1115, 1120, or instructor's approval.

RENR 2155 (RENR 326) Forest Management — Includes 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 GIS to forest management. Prerequisite: Completion of Level 1 or instructor's approval.

RENR 2170 (RENR 158) Log Scaling — Presents 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 — Develops understanding of the basic processes of a variety of industrial activities and their impact on the environment. Students become familiar with various aspects of water and air pollution, siltation control, bioassay techniques, environmental chemistry testing and sampling protocol. Prerequisite: Completion of Level 1.

RENR 2210 (RENR 209) GIS FWR — Introduces students to the basic functions of a GIS and develops entry level expertise with CAD functions, creation of raster and vector themes, database queries, and information display. Students will learn to apply these tools to practical problems in management of fish, wildlife and recreation resources. Prerequisite: RENR 1120.

RENR 2240 (RENR 312) Environmental Law Enforcement — Introduces students to the various legislative acts relating to management of Canada's and British Columbia's wildland resource, including the Fisheries Act, the Parks Act and the Wildlife Act. The course deals with many practical aspects of interpretation and enforcement of the acts and provides a basis for further training in enforcement. It provides training for employment as a technician in resource management fields rather than for immediate employment in enforcement.

RENR 2290 Cooperative Education Work Term 1 — Consists of the application of theory and labs from Term 1 and 2 to the work environment of Renewable Resources Technology. This is a paid position in industry acquired with the assistance of the Cooperative Education office. This position must be a minimum of 12 weeks, and may be a maximum of four months to qualify for credit. Prerequisite: Terms 1 & 2 completed with a minimum cumulative average of 65%.

RENR 3106 Natural Resource Measurements 3 (Theory) — Continues with the principles and concepts introduced in RENR 2106. Expands the concepts within the context of integrated resource measurements particularly as applied in British Columbia. Introduces V-BAR principles, count/enhanced plot concepts, 3-P sampling, stratification principles and added value appraisal techniques. Introduces alternate remote and electronic data sources, their application and limitations. Prerequisites: RENR 2106, 2107, 2115, 2120, COMM 2245, MATH 2451, or instructor's approval.

RENR 3107 Natural Resource Measurements 3 (Practical) — Introduces procedures for advanced variable plot sampling systems. Introduces procedures for double sampling and 3-P sampling. Applied field techniques and procedures appropriate to the concepts introduced in RENR 3106. Provincial inventory valuation and waste and reside procedures and techniques are practiced. Provides a framework to integrate, utilize and practice principles from other subject areas, graphical communications, forest science, soils, forest pestology, silviculture, photo interpretation and statistics. Prerequisites: RENR 2106, 2107, 2115, 2120, COMM 2245, MATH 2451, or instructor's approval.

RENR 3135 (RENR 315) Fire Management 2 (Forestry) — Focuses on forest land management through an understanding of fire management. Main topics are: Fire Ecology, Fire Behaviour Prediction, Planning and Use of Prescribed Fire, Fire Management and Fuel Management Planning, Smoke Management, Forest Practices Act and Regulations. Students develop operations plans for each of the management planning areas studies. Fire simulation is used to exercise and develop skills in planning, assessment, communications, decision-making and supervision. Prerequisites: RENR 2115, 2135, COMM 2245. Enrolled in: RENR 2155, 3145.

RENR 3145 (RENR 305) Silviculture 1 — Begins with the basics of forest management, site productivity, stocking, growth and yield insofar as they affect silvicultural planning and operations. Forest regeneration, including natural regeneration, seed procurement, planting stock production, site preparation, vegetation management and stand tending will be presented in the context of the planning process, the silvicultural prescription and the silviculture surveys applications. Prerequisite: Successful completion of first year.

RENR 3150 (RENR 304) Forest Pestology 1 — Presents an ecologically based study of insects and diseases of concern in B.C. and their impact on forest health. Includes the recognition and identification of currently important organisms as well as the symptoms and damage they produce. Interactions between pest organisms. Life cycles of the more important organisms and the significance of those life cycles in terms sampling and forest management practices. Prerequisite: Completion of first-year Forestry courses or the instructor's approval.

RENR 3155 (RENR 426) Forest Management 2 — See RENR 2245. Prerequisite: RENR 2155.

RENR 3160 (RENR 318) Forest Engineering 1 — Allows students, during outdoor labs, to 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 (Forestry option) — Introduces students to GIS technology used by the forest industry and government agencies. Students will be able to create clean digital maps of forest lands and use associated data for analysis of forestry issues. At the completion of the course, the student will have the ability to use many of the CAD functions of a GIS, use TRIM data to produce a DTM, prepare a perspective view of a proposed cutblock, and conduct simple queries. Students will have an appreciation of some of the data issues related to GIS, and through a review of relevant journal articles, be able to discuss the current state of GIS technology. Prerequisite: RENR 1110, 1120, 2120.

RENR 3175 (RENR 413) Independent Studies — Occupies two weeks following final exams at the end of 2nd year. Students work in the field with a supervisor from a resource management agency or company. It provides an opportunity to obtain special work experience beyond that provided in the usual course of studies. The student will be evaluated by the field supervisor as well as the FWR instructors. The student must submit a report and daily journal detailing the activities during the practicum. Prerequisite: Completion of first and second year of the program or instructor's approval.

RENR 3180 Technical Project 1 (Forestry) — Allows the student to select, organize, and carry out an approved project in the field of natural resource management. The project will normally be carried out in teams and it is expected that in carrying out the project, students will draw on skills developed in first year courses as well as third term concurrent courses. Prerequisites: Completion of all first-year courses or permission from the instructor.

RENR 3181 Technical Project 2 (Forestry) — Continues from RENR 3180. The final results of the project will be documented in a formal term 4 report which will account for a significant portion of the mark for this course. Prerequisite: Completion of RENR 3180.

RENR 3215 (RENR 307) Recreational Land Management 1 — Introduces recreational land management and covers many topics, including: 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 1 — Covers the principles and practice of wildlife management, with particular reference to problems and procedures in B.C. wildlife environments. Topics include: Biology and ecology of wildlife species. Dynamics of wildlife populations. Methods of studying wildlife. Capturing and handling of wildlife for study. Radiotelemetry. Natural and artificial regulation of animal numbers. Diseases and parasites. Control of problem wildlife. Evaluation and enhancement of wildlife habitats. Economic value of wildlife. Management for biodiversity. Management for harvest. Field study is used 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 — Covers the biology of B.C. fish including anatomy, taxonomy, physiology, behaviour 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: First year of the program or instructor's approval.

RENR 3230 (RENR 310) Projects 1 FWR — Conducts a supervised research project in fish, wildlife or recreation. Many of these projects are requested and sponsored by resource management agencies. The student selects a topic of interest and prepares a field-oriented study plan. The student conducts an extensive search of available literature and integrates the results in the progress reports and final report. Extensive field research is conducted by the student and the data collected is presented in both oral and written submissions. High quality of data and presentation is expected. Material from all other courses is integrated into the work of this course. Prerequisite: First year of the program or instructor's approval.

RENR 3235 Fire Management 1 for FWR — Focuses on forest resource management through an understanding of prescribed and wildland fire. Main topics include: Fire Management Planning, Fuel Management Planning, Wildfire Control, Planning and Use of Prescribed Fire, Fire Ecology, Provincial Acts, Regulations and Policies Pertaining to Fire Management and the Integration of Fire Management with Fish, Wildlife and Recreation Resource Management. Prerequisites: Completion of Terms 1 and 2 or instructor's approval.

RENR 3990 Cooperative Education Work Term 2 — Continues work experience based on application of theory and labs from Terms 3 and 4. This is a paid position in the Renewable Resource industry, acquired with the assistance of the Cooperative Education office. This position must be a minimum of 12 weeks and may be a maximum of four months to qualify for credit. Prerequisite: RENR 2290.

RENR 4145 (RENR 405) Silviculture 2 — Covers 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.

RENR 4150 (RENR 404) Forest Pestology 2 — Continues from RENR 3150. The impact of forest management practices on insect and disease conditions. Sampling, measuring and reporting on insect and disease damage. Ecological and legal factors influencing the use of biological and chemical pesticides. Prerequisite: RENR 3150.

RENR 4160 (RENR 417) Forest Engineering 2 — Introduces 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 — Continues from RENR 3215. Prerequisite: RENR 3215 or instructor's approval.

RENR 4220 (RENR 408) Wildlife Management 2 — Continues from RENR 3220. Prerequisite: RENR 3220 or instructor's approval.

RENR 4225 (RENR 409) Fish Management 2 — Continues from RENR 3225. Prerequisite: RENR 3225 or instructor's approval.

RENR 4230 (RENR 410) Projects 2 FWR — Continues from RENR 3230. Prerequisite: RENR 3230 or instructor's approval.

RENR 4990 Cooperative Education Work Term 3 — Continues work experience in Renewable Resources that may include innovative project work integrating labs, theory and previous work experience to address a problem at the work site. This is a paid position in the Renewable Resource industry, acquired with the assistance of the Cooperative Education office. This position must be a minimum of 12 weeks and may be a maximum of four months to qualify for credit. Prerequisite: RENR 3990.

Faculty and Staff

Keith Errington, B.C.L.S., Acting Associate Dean
M. Angelo, B.S.F., M.F. Program Head, Fish, Wildlife, Recreation
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J. Simpson, B.Sc.F., M.Sc.
B. Sivak, B.S.F., M.F., Ph.D., R.P.F.
J. Smyth, Dipl.T.
J. Standish
P. Yanciw, B.Sc., R.P.Bio.

Faculty and Staff: Cooperative Education

J. Hall, Cooperative Education Officer
T. Whitford, Secretary, Cooperative Education

Advisory Committee Members: Fish, Wildlife Recreation Option

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G. Carlson, Ministry of Environment, Chair
M. Coulter, Boisvert, Department of Fisheries & Oceans
B. Farguar, GVRD
R. Forbes, Ministry of Environment, Lands and Parks
W. Henwood, Parks Canada
L. Kiss, C.O.F.I.
A. Lamb, Department of Fisheries & Oceans
J. Lamb, Department of Fisheries & Oceans
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G. Mansiere, Husby Forest Products Ltd.
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B. Nyberg, Ministry of Forests
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C. Scrivener, Department of Fisheries & Oceans
M. Sidney, Environment, Lands and Parks
M. Turner, Ministry of Environment, Lands and Parks
B. Ward, Environment, Lands and Parks
G. Wightman, Ministry of Environment, Lands and Parks
B. White, Pacific Salmon Commission

Advisory Committee Members: Forestry Option

The Forestry Option maintains a committee made up of a select group of representatives from both industry and various governmental organizations. These individuals have experience in current Renewable Resources trends and provide valuable advice to the option concerning the curriculum. Members are normally rotated on a two year basis. The associate dean will provide an up to date list of members on request.

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 products that 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.

Students participate in an industry-sponsored project (practicum or directed studies) in the second-year of the program.

The industry project is an integral program component, which is required for completion and certification. Students may be required to participate in work experience activities at the industry sponsor's regular place of business.

Program Length

Two years, full-time beginning in September each year.

ENGINEERING

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. Industrial experience lends strength to an application.

Program: WOOD PRODUCTS MANUFACTURING

Level 1 (15 weeks)

		hrs/wk	credits
COMM 1135	Introduction to Technical Communication	3.0	3.0
COMP 1130	Computer Applications/ Wood Products	4.0	4.0
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 (20 weeks)

COMM 2246	Technical Communication (Wood Products)	3.0	4.0
COMP 2140	Linear Programming	3.0	4.0
CHSC 1208	Engineering Materials	3.0	4.0
MATH 2461	Statistics and Quality Control for Wood Products Manufacturing	5.0	6.5
MECH 1900	Interpretation of Technical Drawing	2.0	2.5
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	10.0

*The attainment of a recognized industrial certificate with a minimum mark of 70% is required as a condition of graduation.

Level 3 (15 weeks)

		hrs/wk	credits
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 (20 weeks)

COMM 4446	Advanced Technical Communication (Wood Products)	4.0	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

Course Descriptions

CHSC 1208 (CHSC 208) Engineering Materials Wood — Presents 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 1 — 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 2 for Wood Products Manufacturing —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 3 for Wood Products Manufacturing — Allows students to 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. Students practice illustrating, revising and editing skills, and present an oral technical report. Prerequisite: COMM 1135, 2246.

COMM 4446 (TCOM 403) Advanced Technical Communication 4 for Wood Products Manufacturing — Allows students to 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 — Covers 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 — Presents linear programming-manual LP methods and use of the computers to solve LP problems; computer forecasting models, sawmill simulation software and its application. Microcomputer database techniques using dBASE software. Prerequisite: COMP 1130.

ELEX 2845 (ELEC 257) Electrical Equipment — Introduces industrial electrical equipment. Topics include AC and DC motors and their application to electromechanical 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; Programmable Logic Controllers and industrial applications of PLC's.

MATH 1461 (MATH 146) Basic Technical Mathematics for Wood Products Manufacturing — Includes 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 — Includes 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 Technical Wood Drawing — Designed 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 — Presents 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 — Presents 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 — Presents the techniques required to solve plant layout and materials handling problems 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 1164 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 1164.

PHYS 1146 (PHYS 118) Physics for Wood Products 1 — Covers 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 — Presents the second term of the physics course for Wood Products. Topics include thermal physics concepts such as calorimetry, thermal stress, heat transfer and dementary concepts in thermodynamics (ideal heat engine/ideal refrigerator/heat pump). Topics in electricity and magnetism include electrostatics, electric current flow, AC/DC circuits analysis and AC generators/motors. Topics in wave motion include propagation of mechanical waves, sound and EM waves. The presentation is non-calculus and an effort is made to identify relevant technological application of all the concepts presented during the term. The accompanying laboratory program builds on the report writing skills and emphasizes measurements/data analysis. Prerequisite: PHYS 1146.

WOOD 1101 (WOOD 101) Wood Science 1 — Introduces 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* — Presents 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 — 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* — Allows students to 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 — Allows students to 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 — Covers the structure and properties of wood including wood micro and ultra structure; moisture in wood; specific gravity and relative density; rheological behaviour of wood. Lab sessions will complement these topics as well as shrinkage, swelling and dimensional stability of wood.

WOOD 1401 Wood Science 4 — Covers the 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 — Examines the methods and equipment used in the manufacture of lumber in the B.C. Coast and Interior, 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 — Examines the 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 — Supplements 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 — Continues from WOOD 2107.

WOOD 3105 (WOOD 205) Lumber Manufacture 2 — Examines methods and equipment used in the kiln drying and planing of lumber 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. Prerequisite: WOOD 2105.

WOOD 3106 (WOOD 206) Plywood/ Panelboard Manufacture — Continues from 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. Prerequisite: WOOD 2106.

*The attainment of a recognized industrial certificate with a minimum mark of 70% is required as a condition of graduation.

Faculty and Staff

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E.G. Worthy, Dipl.T., A.Sc.T.

Advisory Committee Members: Wood Products Manufacturing

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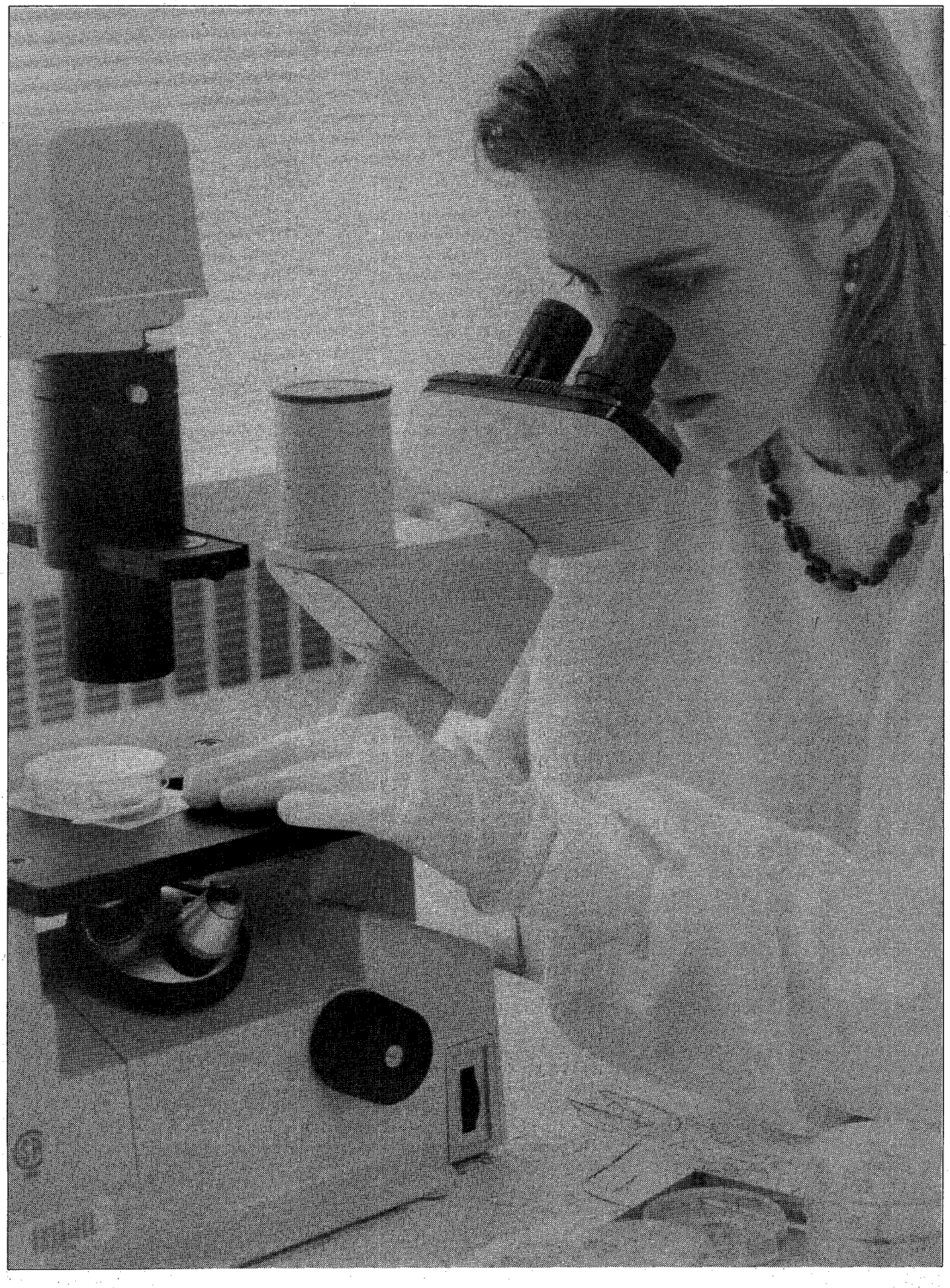
R. Fraser, Lignum Limited
J. Hards, Carroll-Hatch International, Chair
I. Harvey, B.C. Wood Specialties Group
T. Hind, Pacific Forest Products
J. Kennedy, Crestbrook Forest Industries Ltd.
P. Legg, IWA Canada
C. Luke, Western Wood Products Forum
R. McKay, Northwood Pulp & Timber Ltd.
D. Martens, MacMillan Bloedel Limited
R. Stewart, Canadian Forest Products
B. Strongitharm, Primex Forest Products Ltd.



HEALTH SCIENCES

SCHOOL OF HEALTH SCIENCES

HEALTH SCIENCES

ADMINISTRATION

Office of the Dean

George Eisler, M.A.Sc., M.B.A., P.Eng., 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
Adult Echocardiography
Basic Health Sciences
Cardiology Technology
Cardiovascular Technology
Cytogenetics Laboratory Technology
Diagnostic Medical Sonography
Electroneurophysiology Technology
Medical Laboratory Technology
Medical Radiography Technology
Nuclear Medicine Technology

Nursing and Health Engineering

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Loreen Crawford, Program Assistant
Ingrid Friesen, Program Assistant
Kathy Whitham, Program Assistant
Biomedical Engineering Technology
Nursing and Nursing Specialty Programs
Prosthetics and Orthotics

ADULT ECHOCARDIOGRAPHY

Associate Certificate program

This four-month Associate Certificate program in Adult Echocardiography is designed as a subspecialty of the post diploma program in Diagnostic Medical Sonography. Individuals who are eligible to take this course include students who have recently completed the BCIT DMS Diploma program and Diagnostic Medical Sonographers who have previously registered in other specialties with the A.R.D.M.S. It includes classes in pathophysiology and abnormal echocardiographic patterns and an extensive clinical component. Students may be assigned to hospitals outside of the Lower Mainland for clinical experience.

Job Opportunities

Graduates of this program will initially work in hospitals. With experience, opportunities may arise in commercial areas and research.

Program Length

The program is four months in length. It will be offered once a year, starting in November.

Prerequisites

To apply for this program, an applicant must be a recent graduate of the BCIT DMS Diploma program or a sonographer who has previously registered with the A.R.D.M.S. in other specialties. Recent BCIT DMS graduates (within six months) and sonographers sponsored by their hospitals will be considered first priority applicants. As this course assumes knowledge of ultrasound physics and normal cardiac ultrasound patterns as taught in the Diploma program, sonographers must pass preliminary tests in these areas prior to full acceptance into this program. Applicants must meet BCIT's English language requirements.

Selection Process

A completed application must include:

- a brief letter outlining the reasons for wanting to take the course
- a reference letter from a clinical instructor or supervisor
- resume
- a record of the mark obtained in DSON 5101 (formerly DSON 502) if a recent BCIT graduate.

Applications will be reviewed by BCIT and the participating hospitals. Applicants must have proof of a recent (within one year) course in Cardiopulmonary Resuscitation (CPR) in order to be fully accepted into the program.

Courses			credits
BHSC	6603	Cardiac Pathophysiology	1.0
DSON	6101	Adult Echocardiography	31.0

Course Descriptions

BHSC 6603 Cardiac Pathophysiology — Provides an outline of the pathogenesis and etiology of cardiac pathology as seen by cardiac ultrasound.

DSON 6101 Adult Echocardiography — Continues from 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.

Faculty and Staff

Verna Magee Shepherd, M.Sc., CHE, Associate Dean
Anne Rhodes, RDMS, Program Head
John Emes, Ph.D.
Danelda Johnston, RDMS

Clinical Instructors

Kelowna General Hospital
Jennifer Charles, RDCS
Lion's Gate Hospital
Michele Stasiuk, RDCS
Royal Jubilee Hospital
Lois Matthews, RDCS
Royal Columbian Hospital
Jan Rulon
St. Paul's Hospital
Roz Gillis
Surrey Memorial Hospital
Dave Gardner, RDCS
Vancouver Hospital and Health Sciences Centre
Briege McConville

HEALTH SCIENCES

BASIC HEALTH SCIENCES

This department provides courses in human anatomy and physiology, immunology, microbiology, pathophysiology and applied behavioural sciences 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 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 behavioural sciences which provide the student and graduate with the knowledge and comprehension to meet the present and future challenges of the modern health professional.

Faculty and Staff

Verna Magee Shepherd, M.Sc., CHE, Associate Dean
Dave Martin, B.Sc. (Hons.), M.S.R., Program Head
Bev Alder, B.S.N., R.N., M.A.
Jonathan Chiu, B.Sc., M.Sc.
John Emes, B.Sc. (Hons.), M.Sc., Ph.D.
Gordon Handford, B.A.
Greg Marshall, B.Sc. (Kines.), M.Sc. (Kines.)
Tom Nowak, B.A, Dipl.Ed.

BIOMEDICAL ENGINEERING TECHNOLOGY

Diploma Program

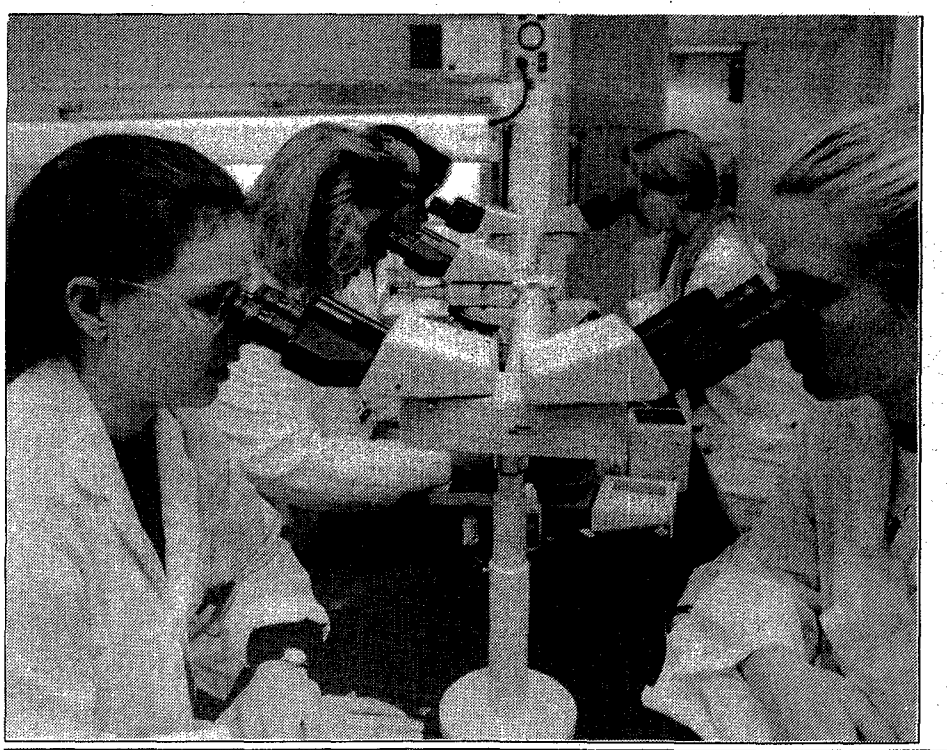
Program Objective

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, other electro-medical diagnostic and therapeutic devices and relevant equipment-related standards.

Job 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 the 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; equipment-related standards. This exposure allows the graduate to work in close association with biomedical engineers, physicians, and others who use, manage, 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.

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 five years.
b) Selection interview with program instructors.
c) Applicants with relevant practical experience or special background may be considered.

Completion of the immunization form is required before final acceptance into the program. Satisfactory health is required for all applicants. Applicants should contact BCIT Medical Services if they have questions related to whether or not their level of health is compatible with the requirements of the Biomedical Engineering program.

HEALTH SCIENCES

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.

Program: BIOMEDICAL ENGINEERING TECHNOLOGY

Level 1 (15 weeks)

		hrs/wk	credits
BHSC 1101	Anatomy and Physiology 1	4.0	4.0
BMET 1100	Electronics Principles and Practice 1	9.0	9.0
COMM 1178	Technical Writing 1 for BMET	3.0	3.0
MATH 1151	Computer Skills and Applications	2.0	2.0
MATH 1781	Basic Technical Mathematics for Biomedical Engineering Technology	8.0	8.0
PHYS 1178	Physics for Biomedical Engineering	4.0	4.0

Level 2 (20 weeks)

BHSC 2201	Anatomy and Physiology 2	3.0	4.0
BMET 2200	Electronics Principles and Practice 2*	5.0	4.0
BMET 2215	Digital Electronics	5.0	6.5
CHEM 1205	Chemistry for Biomedical Engineering Technology	5.0	6.5
COMM 2278	Technical Writing 2 for BMET	2.0	2.5
ELEX 2860	Electronic Prototype Manufacturing	4.0	5.5
MATH 2782	Calculus for Biomedical Engineering Technology	5.0	6.5

Level 3 (15 weeks)

		hrs/wk	credits
BMET 3300	Electronics Principles and Practice 3	7.0	7.0
BMET 3301	Biomedical Device Technology 1	6.0	6.0
BMET 3302	Quality Assurance and Systems	5.0	5.0
CHEM 2305	Biochemistry/ Instrumental Analysis	6.0	6.0
MATH 3151	Software Engineering Using C	5.0	5.0

Level 4 (15 weeks plus practicum)

BMET 4401	Biomedical Devices Technology 2	6.0	6.0
BMET 4402	Biomedical Engineering Technology Project	3.0	3.0
BMET 4403	Medical Imaging Systems	5.0	5.0
BMET 4415	Digital Systems and Microprocessors	5.0	5.0
BMET 4420	Practical Experience in Biomedical Engineering Technology	35.0	11.5
COMM 3478	Technical Writing 3 for BMET	1.0	1.0
ELEX 4855	Electronic Image Displays	4.0	4.0
MATH 3782	Statistics for Biomedical Engineering Technology	3.0	3.0
NURS 1182	Fundamentals of Patient Care*	1.0	2.0

*Denotes a half-term course.

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 — Discusses the basic structure and function of the human body 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 circuit analysis for R, RC, RL circuits and an introduction to AC circuits. Lab exercises are coordinated with course content.

BMET 2200 (BMET 200) Electronics Principles and Practice 2 — Analyzes the properties of AC, RLC circuits and introduces basic active devices and integrated circuits. Topics include AC, RC, RL, RLC circuits, RLC resonant circuits, bipolar transistor and FET fundamentals, discrete amplifier circuits (single and multistage), amplifier stability, power amplifiers, oscillators, power supplies, regulators, IC regulators, differential amplifiers. Prerequisite: BMET 1100.

BMET 2215 (BMET 310) Digital Electronics — Presents 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 and multiplexing. Co-requisite: BMET 2200. Prerequisites: BMET 1100, MATH 1151, MATH 1781.

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 Devices 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 — Presents the electronic equipment used in the biomedical environment 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, 2215.

BMET 4402 (BMET 402) Biomedical Engineering Technology Project — Allows students to build a biomedical device 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 2215, 3300.

BMET 4403 (BMET 403) Medical Imaging Systems— Introduces the concepts and basic hardware involved in imaging systems used in medicine. X-ray, nuclear medicine and ultrasound equipment is examined. Prerequisite: BMET 2215, 3300.

BMET 4410 (BMET 410) Digital Systems and Microprocessors — Includes basic elements of digital systems, memory systems, memory organization, address decoding, programmable logic devices, 68HC16 programming model, addressing modes, instruction format, structured programming, subroutines, parameter passing, stack machines, digital arithmetic, Input/Output, data transfer format, digital communications, interrupts, some development tools and relationships between these tools, and cache memory. Prerequisite: BMET 3300, 2215.

BMET 4420 (BMET 420) Practical Experience in Biomedical Engineering Technology — Allows students to gain practical experience in biomedical engineering 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 five weeks in duration. Prerequisite: BMET 4401, 4402, 4403, 4410.

CHEM 1205 (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 2305 Biochemistry/Instrumental Analysis — Combines the study of the most important aspects of biological chemistry (i.e. properties of carbohydrates, proteins and lipids and how these are metabolized in the body) with a study of the instrumental methods used to analyze substances of biological importance (i.e. spectroscopy, chromatography and electrochemistry). Prerequisite: CHEM 1205.

COMM 1178 (HCOM 104) Technical Writing 1 for Biomedical Engineering Technology — 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 2 for Biomedical Engineering Technology — Builds on the skills taught in COMM 1178. 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) Technical Writing 3 for Biomedical Engineering Technology — Builds on the skills learned in COMM 1178 and 2278 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 2278.

ELEX 4855 (ELEC 259) Electronic Image Displays — Introduces the student to the techniques and mechanisms for digital image acquisition, display, storage and processing. System design is presented with reference to economic and technical considerations. Course topics include image display capabilities and requirements, image archiving, scanning method of image acquisition devices and a system overview with emphasis on system hardware fault analysis.

ELEX 2860 (ELEC 260) Electronic Prototype Manufacturing — Teaches students, through the design and manufacture of specific electronic projects, 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 — Covers 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. Number base conversion, Boolean logic and Karnaugh mapping.

MATH 1151 Computer Skills and Applications — Presents the basic functional components of personal computer systems. Operating systems and the use of MS-DOS and Windows for file organization and handling. The use of electronic spreadsheets to organize and analyze numerical data, produce graphics and printed reports. Basic computer programming concepts using Qbasic. Program design, algorithms, input/output, control of program flow (branching, looping, decision making) as well as entering, editing, saving, retrieving and running programs.

MATH 2782 (MATH 278) Calculus for Biomedical Engineering Technology — Introduces 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. Prerequisite: MATH 1781.

MATH 3151 Software Engineering using C — Covers the C/C++ programming language in an MS-DOS environment, including the topics of data types, console input/output, expressions, functions, branching, looping, arrays and pointers and structure/unions, input/output with files and other devices, and the function of the preprocessor. Systematic approaches to problem formulation, program design and implementation. Computer implementation of several basic algorithms for data manipulation or computations which arise in biomedical electronics technology applications, including solving systems of linear equations, solving nonlinear equations, numerical integration, approximation of functions, statistical computations, and numerical solution of differential equations. Prerequisite: BMET 1115 and 2782.

MATH 3782 (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 alternative hypothesis, large sample hypothesis testing, t-distribution, small sample hypothesis testing. Linear regression and correlation. 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 1178 (PHYS 324) Physics: Biomedical Engineering — Presents 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.
Michael J. Barrett, Dipl.T., A.Sc.T.
Anthony Chan, M.Eng., M.Sc., P.Eng., C.Eng., C.C.E., Program Head
Alan Nichols, B.A.Sc., M.A., P.Eng.

CARDIOLOGY TECHNOLOGY

Certificate Program

The Cardiology program is designed to fulfill the need for specialized technologists skilled in non-invasive diagnostic cardiology procedures.

This program will expose the student to critically ill patients and their families and sophisticated biomedical equipment found within an often demanding hospital or laboratory environment.

Job Opportunities

Graduates may seek employment in hospital cardiology departments, private physicians' offices and professional laboratories. Graduates will be involved in the performance of vital cardiac testing, utilizing a wide range of sophisticated medical equipment which is essential for providing the cardiologist with valuable diagnostic information. Cardiology is a fast-paced, ever-growing medical discipline with opportunities throughout Canada.

The Program

This unique, one-year program combines lectures, lab and class projects as well as clinical experience in designated hospitals and professional laboratories. Students receive a brief introduction to fundamental principles of biomedical electronics and nursing skills with special emphasis on cardiac and respiratory anatomy and physiology. Significant emphasis will be placed on theoretical and clinical application of electrocardiography, cardiac pathology, cardiac pharmacology and cardiac physiology.

Laboratory time will offer the students the opportunity to practice the fundamentals required to perform:

- electrocardiograms
- exercise stress testing
- holter hookup
- holter scanning

Students will also perform simulated analysis, interrogation, and programming of various permanent pacemakers.

Additional studies in health communication, basic research and human behaviour will provide the student with a well rounded exposure to the health care environment.

HEALTH SCIENCES

Program Length
One year, full-time beginning in September each year.

Prerequisites
High school graduation with the following courses all with C+ or better:
- Math 12
- English 12
- Biology 12
- Physics 11
- Chemistry 11

Prerequisites should have been completed within the last 5 years. Individuals whose prerequisites exceed 5 years will be assessed on an individual basis.

Additional requirements include:
- CPR "C" certification (current) prior to admission
- 500-word essay detailing interest in the program
- work-related or volunteer experience is highly recommended
- resume
- two personal references in writing.
- visit to a cardiology department
- basic computer keyboard skills

The most suitable candidates, based upon their applications will be interviewed. Interviews are conducted in late April/May by the program faculty and members of the Cardiology Advisory Committee.

Program Acceptance
Prior to formal acceptance into the program, successful applicants will be required to
- attend an introductory orientation in a hospital cardiology department
- complete the student program acknowledgment form
- complete the student health questionnaire

Expenses
In addition to tuition fees, students will spend approximately $1000 for textbooks, membership fees and other learning materials.

Professional Association Registration
Upon completion of the program, graduates are eligible to write the national registration exam administered by the Canadian Society of Cardiology Technologists.

Program: CARDIOLOGY TECHNOLOGY

Level 1 (15 weeks)		hrs/wk	credits
BHSC 1102	Anatomy and Physiology	4.0	4.0
BHSC 1145	Human Behaviour	3.0	4.0
BMET 1382	Basic Cardiac Instrumentation and Electricity	2.0	2.0
CARD 1150	Electrocardiographic Theory & Principles	13.0	13.0
COMM 1186	Communication and Applied Research	4.0	4.0
NURS 1185	Patient Care	4.0	4.0

Level 2A (10 weeks)			
BHSC 2202	Anatomy and Physiology 2	4.0	2.5
CARD 2250	Cardiology Devices and Techniques	12.0	8.0
CARD 2270	Cardiac Interpretation	5.0	3.5
COMM 2287	Communication and Applied Research	4.0	2.5
MATH 1861	Statistics for Cardiology	4.0	2.5

Level 2B (10 weeks)		
CARD 2251	Cardiology Practicum	25.0

Course Descriptions
BHSC 1102 (BHSC 102) Anatomy and Physiology Cardiology — Introduces 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 Behaviour Cardiology — Explores basic considerations of behavioural science relevant to cardiology technologists' concerns. 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 2202 (BHSC 202) Anatomy and Physiology 2 — Continues from BHSC 1102 and covers basic anatomy and physiology of the remaining body systems. Prerequisite: BHSC 1102.

BMET 1382 (BMET 382) Basic Cardiac Instrumentation and Electricity — Covers the following topics: basic electricity principles, simple circuit analysis, electrical safety and biomedical instrumentation relating to Cardiology Technology practices. The course is a combination of lectures and laboratories. The lab exercises are coordinated with the course content to provide hands-on experience on biomedical equipment and to emphasize important concepts covered during lectures.

CARD 2270 Cardiac Interpretation — Designed to provide comprehensive exposure to the nuances of 12 lead ECG interpretation. All forms of arrhythmias, conduction blocks, infarctions and pacemaker rhythms will be examined. Prerequisite: CARD 1150.

CARD 1150 (CARD 150) Electrocardiographic Theory and Principles — Presents 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, 24-hour holter monitoring and cardiac pharmacology.

CARD 2250 (CARD 250) Cardiology Devices and Techniques — Presents a study of advanced electrocardiographic theory and principles with a practical application for recording and interpreting ECGs for abnormalities in a laboratory setting. The course will include advanced cardiac arrhythmia recognition and physiology, cardiac pharmacology 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 — Allows students to rotate through the Cardiology departments of various hospitals, as well as professional labs and doctors' offices, to obtain clinical experience in performing electrocardiograms, stress testing, holter scanning/hook-up and pacemaker evaluation. Prerequisite: CARD 2250 and all Level 2A courses.

COMM 1186 Communication and Applied Research 1 — Introduces students to the communication needs of health professionals in the cardiology field. Students will also be introduced to the fundamentals of applied research. The course includes organizing information; writing effective memos, letters, instructions, and lab reports; and conducting a literature search. Students will also deliver a formal oral presentation on a cardiology or health-related topic.

COMM 2287 Communication and Applied Research 2 — Continues from COMM 1186. Prerequisite: COMM 1186.

MATH 1861 (MATH 179) Statistics for Cardiology — Provides an understanding of descriptive statistics, elementary probability and statistical estimation and hypotheses testing. These concepts will help the student develop a working understanding of concepts and techniques in each of these topic areas.

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, medical and surgical asepsis, and IV therapy.

CARDIOVASCULAR TECHNOLOGY

Effective September 1994 this program will no longer be offered on a full-time dayschool basis. Cardiovascular Technology has been converted to a distance education, post-diploma offering. Please contact the program head or Health Part-time Studies for details.

Faculty and Staff

Verna Magee Shepherd, M.Sc., CHE, Associate Dean
Gary M. Clifton, Dipl.T., B.Sc., R.C.V.T., RCPT (C), Program Head
Kristin Warburton, Dipl.T., A.R.C.T.

CYTOGENETICS LABORATORY TECHNOLOGY

Post-diploma Program

The Cytogenetics Laboratory Technology Program was not offered during the 1995-96 school year to allow for a full curriculum redesign. For information regarding 1996-97 courses and admission to this program, please contact Fred Bauder, program head, at (604) 432-8296.

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. 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 eight months, clinical applications are emphasized.

Students may elect to learn echocardiography 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 a minimum 2 year allied health program such as Radiography, Nuclear Medicine or Registered Nursing or a Bachelor of Science in an appropriate health related field and with an emphasis on human anatomy and physiology. Applicants must meet English language requirements.

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.

HEALTH SCIENCES

Selection Process

Applications are received after January 1 of the year of the application. 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.

Program: DIAGNOSTIC MEDICAL SONOGRAPHY

Core (all students September-December)
Level 5 (15 weeks including exam week)

			hrs/wk	credits
BHSC	5507	Anatomy and Physiology, Pathophysiology	6.0	6.0
DSON	5102	Abdominal Sonography 1	10.5	10.5
DSON	5103	Obstetrical/ Gynecology Sonography 1	9.5	9.5
PHYS	5273	Physics for Ultrasound	4.5	4.5

Level 6 (35 weeks including exam week and spring break)

DSON	5101	Echocardiography	2.5	3.0
DSON	6102	Abdominal Sonography 2	14.0	24.5
DSON	6103	Obstetrical/ Gynecological Sonography 2	14.0	23.5
DSON	6104	Vascular Sonography	8.0	14.5
PHYS	6273	Physics for Ultrasound 2	1.0	1.0

All courses have a 60% pass mark.

Course Descriptions

BHSC 5507 (BHSC 507) Anatomy and Physiology, Pathophysiology — 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.

DSON 5101 (DSON 502) Echocardiography — Allows the student to 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 — Teaches students the theory and skills necessary 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 — Teaches students the theory and skills necessary 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 — Continues from DSON 5102, with a greater emphasis on clinical skills and applications.

DSON 6103 (DSON 604) Obstetrical/ Gynecological Sonography 2 — Continues from DSON 5103, with a greater emphasis on clinical skills and applications.

DSON 6104 (DSON 605) Vascular Sonography — Teaches students the theory and skills necessary to recognize normal and abnormal structures and Doppler patterns in the vascular system, in addition to gaining some clinical skills.

PHYS 5273 (PHYS 523) Physics of Ultrasound 1 — 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. Prerequisite: Completion of second-year Medical Radiography.

PHYS 6273 Physics of Ultrasound 2 — Continues from PHYS 5273. The emphasis is on doppler applications, bio effects and quality control. Prerequisite: PHYS 5273.

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

Burnaby Hospital
Dixie Cowl, R.D.M.S.
B.C. Children's Hospital
Mumtaz Karmali, R.D.M.S.
B.C. Women's Hospital
Vickie Lessoway, R.D.M.S.
Eagle Ridge Hospital
Dianne Hagen, R.D.M.S.
Kelowna General Hospital
Jennifer Charles, R.D.M.S.
Lion's Gate Hospital
Ann Thur, R.D.M.S.
Michele Stasiuk, R.D.M.S.
Royal Columbian Hospital
Janet Graham, B.Sc., R.D.M.S.
Jan Rulon
Royal Jubilee Hospital (Victoria)
Lois Matthews, R.D.M.S.
St. Paul's Hospital
Paul Stecyk, R.D.M.S.
Roz Gillis, B.Sc.
Surrey Memorial Hospital
Heather Gretchen, R.D.M.S.
Dave Gardner, R.D.C.S.
Vancouver Hospital and Health Sciences Centre
Wendy Forrest, R.D.M.S.
Briege McConville
Anne Hope, R.D.M.S. (UBC)

HEALTH SCIENCES

ELECTRONEUROPHYSIOLOGY TECHNOLOGY

Diploma Program

Modern hospitals and health care clinics require the services of trained technologists to operate sophisticated electroneuro-diagnostic (E.N.D.) 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 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 Diagnostic 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.

Prerequisites

High school graduation with Math 12, Physics 11, Chemistry 11, Biology 12, 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 Resuscitation (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 acknowledgment of program requirements are part of application packages.

Program Length

Two years, full-time beginning in September alternate years.

*Electroneurophysiology is currently under curriculum review. There may be adjustments to the courses described below.

Program: ELECTRONEUROPHYSIOLOGY TECHNOLOGY

Level 1			hrs/wk	credits
BHSC	1112	Anatomy and Physiology	4.0	4.0
CHEM	1117	Chemistry	3.0	6.0
COMM	1180	Communication/ Applied Research	4.0	4.0
ENPY	1151	Fundamentals of Neurology	5.0	5.0
ENPY	1152	Electroneuro-physiology 1	4.0	4.0
MATH	1791	Basic Technical Mathematics for Electroneuro-physiology	5.0	5.0

Level 2			hrs/wk	credits
PHYS	1279	Physics for Electroneuro-physiology	—	3.0
BHSC	2212	Anatomy and Physiology	4.0	5.5
COMM	2280	Communication/ Applied Research	4.0	2.5
ENPY	2250	Electroneuro-physiology 2	8.0	10.5
MATH	2792	Computer Applications and Statistics	5.0	6.5
NURS	1184	Patient Care	3.0	4.0

Level 3				
BHSC	1339	Human Behaviour	4.0	4.0
BHSC	3312	Neuroanatomy and Physiology	6.0	6.0
ENPY	3351	Introduction to Clinical EEG	8.0	8.0
ENPY	3352	Electroneuro-physiology 3	4.0	4.0
ENPY	3353	Nerve Conduction Techniques	5.0	5.0

Level 4			
ENPY	4450	Electroneuro-physiology Practicum	46.5

Course Descriptions

BHSC 1112 (BHSC 111) Anatomy and Physiology 1 ENPY — Introduces human anatomy and physiology that 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 Behaviour ENPY— Explores basic considerations of behavioural science relevant to the electroneurophysiology technologist's concerns. 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 2 ENPY — Builds on information given in BHSC 1112. 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. Prerequisite: BHSC 1112.

BHSC 3312 (BHSC 312) Neuroanatomy and Physiology ENPY — 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. Prerequisite: BHSC 2212.

CHEM 1117 (CHEM 117) Chemistry for Electrodiagnostics — 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 1180 Communication/Applied Research — Introduces technical communication, an overview of the fundamentals of applied research and word processing software and hardware to Electroneurophysiology students. The oral and written technical communication skills plus the research fundamentals are presented concurrently to enable students to understand both processes as they apply in their work. They learn the steps in the technical communication process and apply them in a variety of written memos, letters and reports as well as in oral presentations. Students also address fundamental research topics including: major steps in the research process, basic research terminology, basic research methodology and a literature review.

COMM 2280 Communication/Applied Research — Continues to develop skills and add knowledge in technical communication and applied research. Students begin the term by developing a job application package followed by writing workplace related reports and reports that utilize some of the recently acquired research skills. Additional research topics such as problem identification and solutions, design, ethics, data collection and analysis plus measurement uncertainty and error are examined. This course also includes further developing oral skills such as reporting research and being a persuasive meeting participant. Some assignments may be done jointly with other courses. Prerequisite: COMM 1180.

ENPY 1151 Fundamentals of Neurology — Provides a basic introduction to neurologic disease processes, neurodiagnostic techniques and therapeutic methods, using a case-study model.

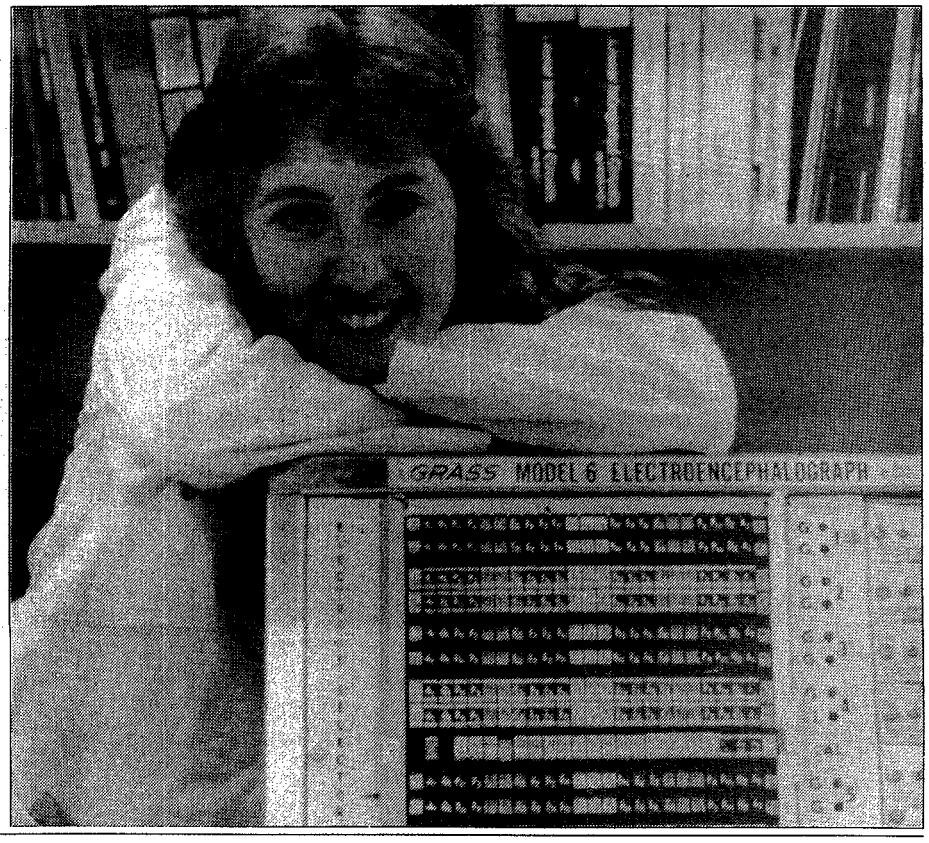
ENPY 1152 Electroneurophysiology 1 — Provides the basic electrical and electronic knowledge and skills needed by technologist — practitioners of electroneurodiagnosis. Emphasis will be on dealing with problems encountered in the clinical environment.

ENPY 2250 (ENPY 250) Electroneurophysiology 2 — 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. Prerequisite: ENPY 1151 and 1152.

ENPY 3351 (ENPY 351) Introduction to Clinical EEG Practice — Provides hands-on patient contact under direct supervision at local hospital EEG laboratories, in preparation for fourth term practicum experience.

ENPY 3352 Electroneurophysiology 3 — Provides exposure to clinical techniques in evoked potentials (including intraoperative monitoring), polysomnograhy and seizure monitoring. Prerequisite: ENPY 2250.

ENPY 3353 Nerve Conduction Techniques — Provides basic training in neuromuscular disease processes, nerve conduction studies (NCV) and electromyography. Prerequisite: ENPY 2250.



ENPY 4450 (ENPY 450) Electroneurophysiology Practicum — Spends an appropriate amount of time 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 and 3351.

MATH 1791 Basic Technical Mathematics for Electroneurophysiology — Reviews 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 and 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 2792 Computer Applications and Statistics — Covers 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. Introduction to 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. Prerequisite: MATH 1791.

NURS 1184 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.

— Presents 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
Michael Young, B.A., Dipl.T., R.E.T., Program Head

ENVIRONMENTAL HEALTH: PUBLIC HEALTH INSPECTOR TRAINING PROGRAM

Diploma Program

The Public Health Inspector/Environmental Health Officer (PHI/EHO) 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 communication 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.

Program Length

Two years, full-time beginning in September each year.

Prerequisites and Selection Criteria Academic Requirements

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

If you are in the process of completing any of the prerequisites when you apply, please indicate this in your application and keep us apprised of your standing at midterm. Forward your final marks as soon as they are available. It is possible to be accepted into the program on a **provisional basis** pending completion of your prerequisites.

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.

Additional Criteria

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.

Preparation

We suggest you contact a health agency in your area and speak to a PHI/EHO about the job. Please realize that workloads in some agencies will limit the available time for such inquiries. If possible, you may want to approach both a rural and an urban agency because the role of the PHI/EHO can vary considerably in these two settings.

Selection Process

Applications are received by the Admissions Department after January 1 of the year of the application.

Selection of candidates is based on currency and strength of prerequisites, relevant experience and demonstrated interest in this field. To support your application we suggest you include the following:

1. resume
2. covering letter/statement of purpose including information on:
   - why you have chosen Environmental Health as a career
   - what steps you have taken in selecting this career path (for example, speaking to a practising PHI/EHO)
   - how has your past experience prepared you for this career (**briefly** highlight relevant experience)
3. reference letters (3 maximum) which refer to your maturity, your ability to communicate and any other personal attributes which will be of benefit in this career.

You are welcome to submit your application in advance of the additional supporting documentation listed above. If you wish to add information to your application, please forward the items to the Admissions department. **Clearly state your name and S.I.N. on each submission.**

Initial selections will likely be made in late March or early April. We will make every effort to select successful candidates as early as possible but the process typically extends into June or July. For information regarding the status of your application, please call the Admissions department at (604) 432-8419.

Professional Association Registration

There is a requirement to become certified prior to being eligible to work as a Public Health Inspector/Environmental Health Officer. The certification process is additional to the academic work at BCIT and is accomplished through the Board of Certification of the Canadian Institute of Public Health Inspectors.

The Certification exam consists of a written portion and an oral portion; the cost is approximately $400.00.

Certification requires that you complete 12 weeks of practicum (field experience) under the supervision of a Certified Public Health Inspector. This practicum can be completed after the first or second academic year.

Anyone commencing their academic program in 1995 and thereafter will require a baccalaureate degree acceptable to the BOC prior to certification. The BOC has approved the following options for persons entering the Environmental Health Diploma Program:

1. For persons who have completed a B.Sc. degree:

Option A:
- complete the Diploma in Environmental Health (two year program) at BCIT
- complete 9-15 credits of post-diploma studies in Environmental Health by distance education through BCIT

2. For persons without a B.Sc. degree:

Option B:
- complete the Diploma in Environmental Health (two-year program) at BCIT
- complete a B.Sc. (Biology) at Simon Fraser University (SFU will grant Environmental Health Diploma graduates 56 credits toward a B.Sc. (Biology); applicants will have to meet the entrance requirements of SFU)
- complete 9-15 credits of post-diploma studies in Environmental Health by distance education through BCIT

Option C:
- complete the Diploma in Environmental Health (two-year program) at BCIT
- complete a B.Tech. degree in Environmental Health through BCIT

Note: The B.Tech. degree is currently under development and will be available by September 1997. The post-diploma courses will be offered primarily by distance education. A two-year work experience in an area related to environmental health will be required as part of this degree program.

Additional Information

- You will need a valid driver's license during your practicum and for permanent employment.
- Accommodation, transportation, etc. are your responsibility during your practicum experiences (some employers do provide vehicles).
- There are a limited number of practicum positions in the Lower Mainland; you may have to relocate for your practicum.

Note: Environmental Health has recently completed a curriculum review. The following information is subject to change:

Program: ENVIRONMENTAL HEALTH

Level 1 (15 weeks)			hrs/wk	credits
BHSC	1123	Microbiology 1	3.0	3.0
CHEM	1108	Chemistry 1 for EH	6.0	6.0
ENVH	1100	Introduction to EH	3.0	3.0
ENVH	1143	Pools and Recreational Water	4.0	4.0
ENVH	1210	Soils	3.0	3.0
ENVH	1220	Hydrogeology	3.0	3.0
MATH	1821	Basic Technical Math for EH	4.0	4.0
OPMT	1119	Introduction to Information Systems	3.0	3.0

Level 2 (20 weeks)		hrs/wk	credits
Full Term			
BHSC 2223	Microbiology 2	3.0	4.0
CHEM 2208	Chemistry 2 for EH	6.0	8.0
COMM 1282	Communication for EH 1	3.0	4.0
ENVH 1300	Food Hygiene	6.0	8.0
PHYS 1282	Physics: Environmental Health	3.0	4.0
First 10 weeks			
ENVH 2200	Water Supply	4.0	2.5
ENVH 2266	Epidemiology and Biostatistics	4.5	3.0
Second 10 weeks			
BHSC 1204	Anatomy and Physiology	4.0	2.5
ENVH 2210	Sewage Disposal Methods	4.0	2.5

Level 3 (15 weeks)			
CHEM 3313	Analytical Measurements	4.0	4.0
CHEM 3321	Introduction to Toxicology	3.0	3.0
COMM 2382	Communication for EH 2	4.0	4.0
ENVH 2100	EH Legislation	3.0	3.0
ENVH 3400	Industry Project 1	2.0	2.0
ENVH 3500	Human Relations	5.0	5.0
ENVH 3600	Environmental Assessment	5.0	5.0
FOOD 3020	Food Microbiology for EH	4.0	4.0

Level 4 (20 weeks)			
Full term			
BHSC 3423	Communicable Disease Control	4.0	5.5
CHEM 4422	Environmental Chemistry	5.0	6.5
ENVH 3100	Applied Law	4.0	5.5
ENVH 4459	Industry Project 2		
ENVH 4500	EH Organizations	2.0	2.5
First 10 Weeks			
ENVH 1124	Pest Management	4.0	2.5
ENVH 4600	Indoor Air Quality	5.0	3.5
Second 10 weeks			
ENVH 3200	Land Use	4.0	2.5
ENVH 4471	Food Equipment and Processing	2.5	

Course Descriptions

BHSC 1123 (BHSC 123) Microbiology 1 ENVH — Prepares the student for the applied microbiology in BHSC 2223 that 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) Anatomy and Physiology ENVH — 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) Microbiology 2 ENVH — Builds 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 ENVH — 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 — Presents 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 — Introduces 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) Analytical Measurements — Presents the principles and laboratory procedures for the more common instrumental methods of chemical analysis: spectroscopic methods including visible, ultraviolet and infrared spectroscopy, atomic absorption spectroscopy, flame photometry, potentiometry, polarography and chromatography. Prerequisite: CHEM 2208.

CHEM 3321 Introduction to Toxicology — Provides students with a background in the science of toxicology. The course covers basic biochemistry and the effects of environmental chemical pollutants on organs and body systems. The chemicals discussed include heavy metals, pesticides, organic solvents and air pollutants. Prerequisite: A college level introductory organic chemistry course or equivalent.

CHEM 4422 Environmental Chemistry — Examines the sources and effects of environmental pollutants and chemical wastes, and the treatment or detoxification methods which may be employed to reduce the amount of toxic pollutants released into the environment. The laboratory portion of the course involves analysis of common environmental pollutants and interpretation of the results obtained. Prerequisite: A college level introductory organic chemistry course or equivalent.

COMM 1282 (HCOM 106) Communication for Environmental Health 1 — 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 2382 (HCOM 205) Communication for Environmental Health 2 — Builds on skills learned in COMM 1282 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 1282.

ENVH 1100 Introduction to Environmental Health — Introduces the student to the role, duties, responsibilities and behaviour of the PHI/EHO. Relevant professional organizations and government agencies are described. The structure of the provincial and federal judicial systems, the development of legislation and the general application of legislation is examined. The student is also introduced to blueprint reading.

ENVH 1124 (ENVH 124) Pest Management — Introduces 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 1143 (ENVH 143) Pools and Recreational Water — Introduces the student to the health concerns associated with swimming pools and bathing beaches. The operational characteristics and requirements of different pool types is examined in order to provide the student with the necessary knowledge and skills to protect the public health. The section on recreational bathing beaches focuses on assessment and monitoring of the beach water and its surrounding environment. Various provincial regulations and national standards governing these topics are examined.

ENVH 1210 Soils — Provides an introduction to the development and properties of soil. These properties are used to determine the soil's capacity to move liquid waste and domestic sewage.

ENVH 1220 Hydrogeology — Introduces the concepts and methods needed to make preliminary hydrogeological assessments and to predict groundwater flow. These principles are used to assess risk to both health and the environment.

ENVH 1300 Food Hygiene — Provides the student with the knowledge and skills required to protect public health in matters relating to food processing, handling, storage, and food facility design and equipment. Emphasis is placed on legislative control and enforcement, inspection techniques, and the causes and investigation of foodborne illness. This course has an off-campus practicum requirement.

ENVH 2100 Environmental Health Legislation — Builds on the concepts introduced in ENVH 1100. A wide variety of legislation relevant to the field of environmental health is examined. Students practice interpreting and applying selected pieces of legislation and examine the practical limitations that will be encountered in enforcement situations. Topics covered include housing, institutional and community care facilities, personal services establishments and emergency measures. Prerequisite: ENVH 1100.

ENVH 2200 Water Supply — Examines the methods and processes used to develop and supply a safe drinking water supply. Both small and large scale water supply and distribution systems are discussed. Chemical and bacteriological sample results are interpreted. The steps used in investigating and controlling a waterborne illness are also presented. Prerequisite: ENVH 1200.

ENVH 2210 Sewage Disposal Methods — Describes the methods of collecting and disposing of liquid waste without causing a public health hazard. Both residential and commercial/large scale flows are examined. The relative effectiveness of primary, secondary and tertiary treatment is considered. The role of the PHI/EHO in approving and inspecting sewage disposal systems is covered in detail. Prerequisite: ENVH 1200.

ENVH 2266 (ENVH 266) Epidemiology and Biostatistics — 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.

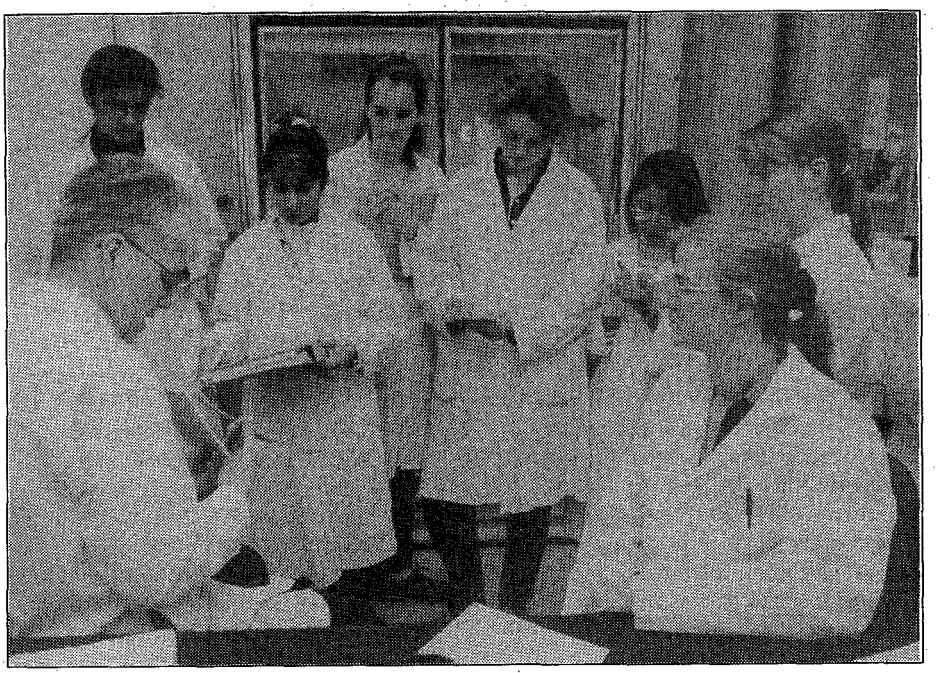
ENVH 3100 Applied Law — Presents a study of how the legal system is (or should be) utilized by PHI/EHOs as one of the tools of their profession. This course builds on the knowledge gained from ENVH 1100 and ENVH 2100 by focusing on the practical realities of enforcement of regulations. Topics covered include collection and presentation of evidence, preparation of an information, ambiguities, liability, appeals, freedom of information and the use of ticketing, injunctions and other remedies. Actual case studies will be used to illustrate the importance of these topics. Prerequisite: ENVH 2100.

ENVH 3200 Land Use — Focuses on the responsibility and duties of the PHI/EHO in land development. The procedure by which land is subdivided and developed is examined. Other topics include the implications of using land for the disposal of hazardous wastes and dealing with contaminated soil.

ENVH 3400 Industry Project 1 — Allows students to apply team-building, communication and organizational skills to the development of a proposal for an industry-sponsored project. The project proposed in this course will be conducted and presented in ENVH 4400. Close contact with the industry sponsor ensures that the proposal meets the needs of industry. The student will conduct a literature review, prepare a written proposal and present the proposal orally. This course has an off-campus practicum requirement.

ENVH 3500 Human Relations — Teaches students how to function effectively in a team situation and discuss how to employ good human relations skills in carrying out the duties and responsibilities of a PHI/EHO. Interactive techniques such as role playing and interviewing are examined. The student will be introduced to the relevant concepts used to produce an educational presentation and/or a promotional program in the environmental health field.

HEALTH SCIENCES



ENVH 3600 Environmental Stressors — Introduces the student to common chemical, physical factors that potentially constitute environmental health hazards. Examples include gases and vapours, noise, and radiation (including light). Through lectures and laboratory exercises the student will be able to recognize these factors, evaluate the degree of the hazard using appropriate environmental sampling equipment, and be aware of possible control measures. This course has an off-campus practicum requirement. Prerequisite: MATH 1821, PHYS 1282.

ENVH 4300 Food Equipment and Processing — Addresses a wide range of food processing and preservation techniques relative to the survival and growth of microorganisms in foods. Examples of foods that are potentially hazardous are discussed in detail. Legislation pertaining to the commercial food industry is examined. The operation, maintenance, cleaning and disinfection of common food facility equipment is described. Prerequisite: FOOD 3020.

ENVH 4400 Industry Project 2 — Allows students to continue to develop the team-building, communication and organizational skills applied in ENVH 3400. The project proposed in that course will be carried out. A written report will be prepared and an oral presentation will be made. This course has an off-campus practicum requirement. Prerequisite: ENVH 3400.

ENVH 4500 Environmental Health Organizations — Presents a study of organizational theory and organizational behaviour as it relates to environmental health organizations. The student is exposed to the concepts and theories of organizational behaviour, design, dynamics, change, motivation, behaviour modification and communication as they relate to real-life organizations. Issues related to strategic planning and performance appraisal are also covered.

ENVH 4600 Indoor Air Quality — Examines chemical, physical and biological factors relating to indoor air quality. The lecture and lab exercises build on the concepts introduced in ENVH 3600. The sources of gases and vapours, particulates and microorganisms in homes, commercial premises and facilities will be discussed. Issues relating to survey design and data interpretation are addressed. Options for improving indoor air quality are examined. This course has an off-campus practicum requirement. Prerequisite: ENVH 3600.

FOOD 3020 Food Microbiology for Environmental Health — Provides an overview of the laboratory techniques used in the detection, enumeration and identification of microorganisms of importance in the field of environmental health. Topics include basic microbiological safety procedures, aseptic techniques, sample collection techniques, proper plating methods and isolation techniques. Sampling will be done on a variety of foods and food contact surfaces. Control techniques such as food preservation and the use of sanitizing agents will also be discussed. Prerequisite: BHSC 2223.

MATH 1821 (MATH 182) Basic Technical Math for Environmental Health — Emphasizes the integration of problem solving strategies with mathematical and calculator skills in the context of relevant environmental health applications. Topics include unit conversions, ratio/proportion, percentages (ppm, ppb), area/volume calculations for regular/irregular shapes and solids, linear, logarithmic and exponential functions with appropriate curve fitting (least squares) and trigonometry. Applications include pesticide mixtures, fluid/air flow, volumes and/or areas related to pools, hot tubs, toxic spills and septic fields, noise relationships, radioactive decay, rinsing problems, running log mean and transit/clinometer calculations.

OPMT 1119 Introduction to Information Systems — Introduces the student to computers. Lectures and practical exercises are used to present topics on computer terminology, hardware, software, DOS (Disc Operating System), word processing, spreadsheets, database systems and other communication systems relevant to the environmental health field.

PHYS 1282 (PHYS 212) Physics: Environmental Health — Introduces 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: 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

Medical laboratory technologists as members of the Health Care Team perform laboratory investigations, relating to the diagnosis, treatment and prevention of disease by analyzing various types of biological specimens. These specimens include blood, urine, feces, sputum and tissues. Technologists also have significant patient contact primarily through blood collection.

The testing is performed in five different sections of a laboratory:

- Clinical chemistry
- Clinical microbiology
- Hematology
- Histotechnology
- Transfusion Medicine (Blood Banking)

Entry-level work may be repetitive, but there are opportunities for advancement with experience and additional education. Complexity of the testing may vary from highly automated to very manual.

Medical Laboratory Technology is a field suited to both men and women.

Job Opportunities

The Registered Technologist (RT) certification is nationally recognized and is a requirement for employment in most Canadian Medical Laboratories.

In B.C., the starting salary of an entry level technologist is approximately $18 per hour (1993 scale), $35,000 per year. Technologists in senior management positions earn about $60,000 per year.

In most hospitals, the Medical Laboratory Technologists are members of a union (Health Sciences Association — HSA).

Upon completion of training a technologist may seek to work in one section of a large hospital or rotate through several sections in a smaller hospital. Medical Laboratory Technologists are also employed in private clinical laboratories, Canadian Red Cross Blood Transfusion centres, B.C. Centre for Disease Control, veterinary laboratories, clinical research laboratories, and commercial supply companies.

Many laboratory services are required on a 24-hour basis. As a result, the majority of Medical Laboratory Technology positions in laboratories include some shift work (weekends, afternoons and/or nights).

Medical Laboratory Technologists handle potentially infectious material from patients. Technologists wear gloves, gowns and other protective garments. Conditions which could exclude employment include:

- open skin lesions (dermatitis)
- back problems — duties require lifting, bending and standing for extended periods of time.

Program Length

The program will consist of two years (nine months each) of academic studies at the Institute followed by a 12-month clinical training period spent in one of the clinical facilities (hospital or private lab) affiliated with the program.

Prerequisites

Prerequisites for the three-year program are high school graduation with a minimum C+ standing in each of Biology 12, Chemistry 12, English 12, Math 12 and Physics 11. These prerequisites should have been completed during the past five years. If longer than five years has elapsed, individual assessment will be required.

Basic Keyboarding skills are also required. Standard level first aid certificate (for example, St. John's Ambulance, Canadian Red Cross) and C.P.R. (level C) are recommended.

Applicants who have qualifications above the Grade 12 requirement are also eligible to apply. It is unlikely that credit toward Medical Laboratory Technology (MLT) program courses will be given for university/college level courses previously completed.

Applicants lacking the required prerequisites but who have graduated from a Medical Laboratory Science Program outside of Canada, and have relevant work experience will be considered for admission to the first year of the Medical Laboratory Technology Program. These applicants must meet residency and the BCIT Grade 12 English requirements. Completion of the English Language Assessment at King Edward Campus, Vancouver Community College is advised.

Other Admission Requirements

Applicants are expected to be competent in written and oral English. Applicants should possess a caring and professional attitude, meticulous work habits, fine motor skills, 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 have strong problem solving skills, good interpersonal skills and be able to function as part of a team. Applicants should be aware that this program is physically demanding and requires students to stand for long periods of time. Applicants should have clear skin (open lesions may prohibit participation due to potential risk to students and patients) and must be able to clearly differentiate colours.

Students must complete an immunization program. Vaccination against hepatitis B is strongly recommended for students accepted into the program and is available at the Institute free of charge.

Admissions Process

1. Applicant completes Admissions Application Form and submits to the Admissions department at BCIT. The application fee and supporting transcripts/documentation must accompany the application form.
2. Qualified applicants will be pre-screened at BCIT by the MLT Student Selection Committee according to their grades (or interim grades) and an initial selection will be made.
3. Applicants selected for interview by the MLT Student Selection Committee will be required to arrange a clinical laboratory tour and complete a questionnaire regarding the tour. The purpose of this tour is to introduce the applicant to the routine environment of the clinical laboratory and to enable them to see the daily operation of such a diagnostic services department. The tour must be completed prior to the interview.
4. Applicants will be requested to attend a standardized selection interview. The purpose of the interview is to determine their motivation and commitment to a future career in Medical Laboratory Technology and to determine fluency in oral and written English.
   The admission process is selective and the applicants admitted to the program will be those who the interview panel believe to be the best qualified for a future career in Medical Laboratory Technology.
5. All applicants will receive, in writing, from the Admissions Office at BCIT, notice of the status of their application, i.e. acceptance into the program or nonacceptance into the program.

HEALTH SCIENCES

Expenses

In addition to tuition fees, students will spend approximately $1,600 for textbooks, membership fees and other learning materials including uniforms which are required in the third (clinical) year of the program.

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 RT certification with the Canadian Society of Laboratory Technologists (CSLT).

Professional Association Registration

Certification is obtained by successfully completing the Registered Technologist (RT) National Certification examinations offered by the Canadian Society of Laboratory Technologists (CSLT). Upon completion of the clinical year, the exams (pass mark 60%), consisting of three papers are written over a two-day period in the middle of June.

Accreditation

All participating laboratories and BCIT are accredited for training by the Canadian Medical Association Accreditation Services: a peer review process involving representatives from several laboratory professional associations, physicians and educators.

Program: MEDICAL LABORATORY TECHNOLOGY

Year one

Level 1 (15 weeks)		hrs/wk	credits
BHSC 1107	Anatomy and Physiology 1*	4.0	3.5
BHSC 1121	Immunology*	4.0	3.5
COMM 1170	Communications 1*	2.0	1.5
MLAB 1101	Master Student Program 1 week block (30 hrs)*	30.0	2.0
MLAB 1102	Clinical Microbiology 1*	6.0	5.0
MLAB 1106	Laboratory Practices and Principles 1*	5.0	4.5
MLAB 1107	Microscopy and Microanatomy*	6.0	5.0
MLAB 1111	Clinical Experience 1 — 1 week block (30 hrs)*	30.0	2.0

MLT students may not continue into the second level of the MLT program unless they have obtained a passing grade in all of the MLT Level 1 program courses.

Level 2 (20 weeks)		hrs/wk	credits
BHSC 2207	Anatomy and Physiology 2	3.0	3.5
COMM 2270	Communications 2	2.0	2.0
MLAB 1110	Clinical Chemistry 1	9.0	TBA
MLAB 1112	Hematology 1	6.0	7.0
MLAB 1114	Histological Techniques 1	3.5	TBA
MLAB 2102	Clinical Microbiology 2	7.0	8.5
MLAB 2106	Laboratory Practices and Principles 2*	4.0	3.5
MLAB 2111	Clinical Experience 2 — 2-week block (60 hrs)*	30.0	4.0

MLT students may not continue into the third level of the MLT program unless they have obtained a passing grade in all of the MLT Level 2 program courses.

Prior to the start of second year, students will be informed of their clinical placement for the third year of the program.

Year two

Level 3 (15 weeks)		hrs/wk	credits
MLAB 1115	Transfusion Medicine 1*	4.0	3.5
MLAB 2110	Clinical Chemistry 2*	8.0	7.0
MLAB 2112	Hematology 2	5.0	TBA
MLAB 2114	Histological Techniques 2*	6.0	5.0
MLAB 3102	Clinical Microbiology 3*	8.0	7.0
MLAB 3111	Clinical Experience 3 — 2-week block (60 hrs)*	30.0	4.0

MLT students may not continue into the fourth level of the MLT program unless they have obtained a passing grade in all of the MLT Level 3 program courses.

Level 4 (20 weeks)		hrs/wk	credits
COMM 3470	Communications 3*	2.0	1.5
MLAB 2115	Transfusion Medicine 2	8.0	9.5
MLAB 3110	Clinical Chemistry 3	9.0	10.0
MLAB 3112	Hematology 3	5.0	6.0
MLAB 3114	Histological Techniques 3*	2.0	0.5
MLAB 4102	Clinical Microbiology 4	7.0	8.0
MLAB 4111	Clinical Experience 4 — 2 week block (60 hrs)*	30.0	4.0

*denotes a half-term course

MLT students may not continue into the fifth level of the MLT program unless they have obtained a passing grade in all of the MLT Level Four program courses.

Year three

The third (clinical) year of the program is spent in one of the clinical laboratories associated with the training program. Clinical training laboratories are located in Vancouver and the surrounding area and on Vancouver Island. All participating laboratories are accredited for training by CMA Conjoint Committee for Accreditation.

Level 5 (June - December)		hrs/wk	credits
MLAB 5111	Clinical Experience 5	35.0	TBA

MLT students may not continue into the sixth level of the MLT program unless they have obtained a satisfactory standing in the MLT Level 5 clinical experience.

Level 6 (January - May)			
MLAB 6111	Clinical Experience	35	TBA

MLT students may not graduate from the MLT program unless they have obtained a satisfactory standing in the MLT Level 6 clinical experience.

Course Descriptions

BHSC 1107 Anatomy & Physiology 1 — Presents a systematic approach to the study of human anatomy and physiology for MLT students. The course includes an introduction to the skeletal, muscular, nervous, circulatory, respiratory, digestive, urinary and reproductive systems.

BHSC 1121 Immunology MLAB — Provides a general background to MLT students who are encountering immunology for the first time. The course deals with body defences 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.

BHSC 2207 Anatomy & Physiology 2 — Continues from BHSC 1107 and covers basic anatomy and physiology of the remaining systems. Prerequisite: BHSC 1107.

COMM 1170 Communication for Medical Laboratory 1 — Introduces students to the communication needs of the health profession. Students will learn how to communicate well with patients, other health professionals, their peers, and their instructors. The course will cover planning, organizing, and presenting information orally and in writing. Specific assignments include action memos, procedures, explanations, informative presentations and a clinical experience report.

COMM 2270 Communication for Medical Laboratory 2 — Builds on the communication skills in Level 1. Students will learn how to present themselves confidently and persuasively over the phone, in presentations, in meetings and in a professional job search. Specific assignments include telephone techniques, persuasive presentations, problem solving and conflict resolution in meetings, a job package including a resume, cover letter and interview techniques. Prerequisite: COMM 1170.

COMM 3470 Communication for Medical Laboratory 3 — Students will apply the skills developed in COMM 1170 and 2270 to present oral and written reports based on medical laboratory case studies. Prerequisite: COMM 1170, 2270.

MLAB 1101 Master Student Program — Designed to help students learn more efficiently and assume control of their learning. The course will focus on increasing life skills, academic skills and awareness of the resources available for assistance.

MLAB 1102 Clinical Microbiology 1 — Provides a detailed study of Clinical Microbiology theory, laboratory methodology and techniques. Emphasis is on organism properties and characteristics, the effects of antimicrobial agents and concepts of infectious disease in humans. Through practical laboratory sessions, the student develops the skills needed for further study.

MLAB 1106 Laboratory Practices and Principles 1 — Includes essential information regarding safe laboratory practice, and correct sterilization and disposal of laboratory waste. The student will be introduced to the basics of computer terminology and use, medical terminology, and human genetics. Concepts of professionalism, ethical behaviour, confidentiality and interpersonal skills will be studied as a basis for further professional and personal growth. Laboratory Practices and Principles courses include subject areas common to all specialized subjects within Medical Laboratory Technology. These diverse topics are essential to the core knowledge of the laboratory technologist.

MLAB 1107 Microscopy and Microanatomy — Introduces the student to the theoretical principles and practical use of the light microscope. Topics which will be covered include basic optics, lenses and aberrations, image formation, the brightfield light microscope phase contrast microscope, polarized light microscope, fluorescence microscope, inverted microscope and stereoscopic microscope. Laboratory sessions will instruct the student in the correct use and proper adjustment of the microscope. A theoretical introduction to the electron microscope will also be presented.

Students will be introduced to the microscopic appearances of normal cells and human body tissues. Studies will include the structure of the cell, organelles, primary tissues and the main systems of the human body. Students will use a variety of microscope systems to examine prepared specimens of body tissues.

MLAB 1111 Clinical Experience 1 — Requires full-time attendance in the medical laboratory department of an affiliated hospital laboratory. The purpose is to orient the student to a hospital laboratory.

MLAB 1112 Hematology 1 — Designed to provide the student with a detailed study of the production and function of blood cells. Laboratory procedures and techniques will enable the student to develop the basic skills and understanding required to perform hematology tests and to interpret the results. Emphasis will also be placed on the study of disease states causing anemia.

MLAB 1114 Histological Techniques 1 — Covers the basic, routine techniques which are used in a histopathology laboratory for the preparation of body tissues removed at surgery or at autopsy for microscopic examination. Lectures will describe procedures for the preservation of body tissues, methods for the preparation of routine tissue sections and the principles of selected demonstration techniques that are used for the identification of specific tissue components. Laboratory sessions will provide a hands-on opportunity to perform these procedures and techniques. Students will be given a number of samples of tissue and will be expected to produce a specified number of completed tissue preparations. Prerequisite: MLAB 1107.

MLAB 1115 Transfusion Medicine 1 — Immunohematology is the division of laboratory technology that is practiced in the Transfusion Medicine Department (Blood Bank). It combines the sciences of immunology, hematology and genetics to investigate the fundamental differences in human blood, to ensure safe and effective transfusion of blood and its component parts.

Immunohematology 1 introduces the student to the major blood group systems using serological tests to detect antigens and antibodies. The donation of blood and blood component preparation will also be included.

MLAB 1210 Clinical Chemistry 1 — Designed to familiarize the MLT student with mathematics employed in the clinical laboratory, common glass and plasticware, safety procedures and reagent preparation. The laboratory component consists of practical application of these techniques and development of technical skills.

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 second part of this course. The last portion of the course deals with the analysis of protein in various body fluids.

MLAB 2102 Clinical Microbiology 2 — Builds on the concepts learned previously by examining the specific bacterial origins to infections of the respiratory and genital tracts. Emphasis is on the laboratory isolation, identification and reporting procedures. Students continue developing skills in practical laboratory sessions and are provided with an opportunity to perform and interpret tests to diagnose infectious disease. Prerequisite: MLAB 1102.

MLAB 2106 Laboratory Practices and Principles 2 — Laboratory Practices and Principles courses include subject areas common to all specialized subjects within Medical Laboratory Technology. These diverse topics are essential to the core knowledge of the laboratory technologist.

Laboratory Practices and Principles 2 will include instruction and actual practice in blood collection, and basic first aid and cardiopulmonary resuscitation (CPR). Statistics relevant to the practice and organization of the medical laboratory, professional societies, medical law, and laboratory accreditation procedures will also be discussed. Prerequisite: MLAB 1106.

MLAB 2110 Clinical Chemistry 2 — Covers a detailed study of the analysis of various body fluid constituents including non protein nitrogenous substances, lipids and carbohydrates. Emphasis is placed on the metabolism, function, measurement and relationship of the levels of these various substances to disease states. Prerequisite: MLAB 1110.

MLAB 2111 Clinical Experience 2 — Requires full-time attendance in the medical laboratory department of an affiliated hospital laboratory. Hands-on experience will be gained. This clinical experience will occur in the same hospital as MLAB 1110. Prerequisite: MLAB 1111.

MLAB 2112 Hematology 2 — Designed to provide the student with a detailed study of hematologic malignancies. Emphasis is placed on theory and practical skills required to understand and identify the characteristics of hematologic neoplasms. Prerequisite: MLAB 1112.

MLAB 2114 Histological Techniques 2 — Includes routine and specialized procedures that are used in diagnostic histopathology laboratories for the examination of human body tissues. The emphasis of the course will be on the application of specific methods and principles to confirm possible diagnoses. The course will cover the theoretical principles and practical performance of the methods used in the investigation of fibrosis, infarction, infection, inflammation, neoplastic changes, malignancy and degeneration. Methods to identify changes in morphology, carbohydrate and protein histochemistry, infectious agents, and lipid content will be discussed. Students will perform these methods and will be expected to examine their results microscopically to correlate their findings with the proposed condition. Prerequisite: MLAB 1114.

MLAB 2115 Transfusion Medicine 2 — Immunohematology is the division of laboratory technology that is practiced in the Transfusion Medicine Department (Blood Bank). It combines the sciences of immunology, hematology and genetics to investigate the fundamental differences in human blood, to ensure safe and effective transfusion of blood and its component parts.

Immunohematology 2 builds on the basics learned in Immunohematology 1. The focus will be on clinical application, and will include detection and resolution of abnormal results. Prenatal diagnosis of hemolytic disease of the newborn, compatibility testing to ensure safe transfusion, investigation of adverse reactions to transfusion, and the autoimmune hemolytic anemias will be studied, which will include extensive laboratory practical work. Prerequisite: MLAB 1115.

MLAB 3102 Clinical Microbiology 3 — Provides a detailed study of infectious agents of the gastro-intestinal, urinary tracts, cerebral spinal and circulatory systems. The laboratory sessions continue to provide practical applications to the theory. The student will learn new techniques to aid the clinician in timely patient treatment. Prerequisite: MLAB 2102.

MLAB 3110 Clinical Chemistry 3 — Presents an in-depth study of electrolytes, acid-base balance, enzymes, liver and kidney function, lig and assays, toxicology and quality assurance. Cerebral spinal fluid analysis and thyroid testing is also included. Emphasis is placed on the metabolism, function, measurement and relationship of the levels of these various substances to disease states. Prerequisite: MLAB 2110.

MLAB 3111 Clinical Experience 3 — Requires full-time attendance in a clinical laboratory. Hands-on experience will be gained. This clinical experience will occur in the same clinical laboratory as MLAB 5111 and 6111. Prerequisite: MLAB 2111.

MLAB 3112 Hematology 3 — Designed to provide the student with theoretical and practical study of hemostasis and thrombosis. This course also includes an introduction to automated techniques used in the hematology laboratory. Prerequisite: MLAB 2112.

MLAB 3114 Histological Techniques 3 — Concludes a series dealing with examination of body tissues for diagnosis, this course will provide a summary and review of all methods previously performed, and will correlate the principles of the methods with the results which are produced. New technologies, recent developments, and current trends in this branch of laboratory medicine will also be discussed. Prerequisite: MLAB 2114.

MLAB 4102 Clinical Microbiology 4 — Looks at laboratory techniques in intestinal parasitology and mycology, as well as providing an understanding of the newer technologies of current interest in today's Clinical Microbiology laboratories. Laboratory sessions are also used to review pathogen isolation, identification and completing patient reports to prepare the student for the clinical training. Prerequisite: MLAB 3102.

MLAB 4111 Clinical Experience 4 — See MLAB 3111. Prerequisite: MLAB 3111.

MLAB 5111 Clinical Experience 5 — Requires full-time attendance in a clinical laboratory. The purpose is to further the skills necessary for students to function safely and competently in a medical laboratory. Hands-on experience will be gained in the same laboratory as MLAB 3111 and 4111. Prerequisite: MLAB 4111 and all other Level 4 courses.

MLAB 6111 Clinical Experience 6 — See MLAB 5111. Prerequisite: MLAB 5111.

Faculty and Staff

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.)
Kathleen McCord, R.T.
Shelley Tiffin, A.R.T., (Clin. Micro.)
Dorothy Yarema, B.Sc., R.T.

Technical Staff

Sandra Del Vecchio
Keiko Fitz-Earle, R.T.
K. Patricia MacCulloch, R.T.
Heather A. Pedlar, R.T.
Vivian Tang, R.T.

Clinical Coordinators and Instructors

Because of restructuring of the MLT program, a list of the clinical sites and the clinical instructors who contribute to the program in each of the three years was not available at the time of printing of this calendar.

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 wellbeing 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 several countries. Entry level salaries begin at $38,500 /annum to $54,000 /annum for senior levels.

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.

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 five years. If longer than five 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 wellbeing 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 three-day clinical orientation in a radiology department.

HEALTH SCIENCES

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. An additional 30 credits at the Open University will lead to a BHSc degree. Simon Fraser University grants 57 credits towards a Bachelor of Science degree to graduates of this program.

Program: MEDICAL RADIOGRAPHY TECHNOLOGY

Year one
Level 1 January to April (17 weeks)

		hrs/wk	credits
BHSC 1113	Anatomy and Physiology 1	2.0	2.5
BHSC 1141	Human Behaviour 1	1.0	1.0
MRAD 1100	Clinical Education 1	12.5	17.0
MRAD 1101	Radiographic Procedures 1	5.0	5.5
MRAD 1102	Medical Imaging 1	4.0	4.5
MRAD 1103	Radiographic Technique and Evaluation 1	2.0	2.5
MRAD 1104	Radiographic Anatomy and Physiology 1	3.0	3.5
NURS 1180	Patient Care	2.0	2.5
PHYS 1272	Physics for Medical Radiography	5.0	5.5
MRAD 1113	Master Student Program	2.0	TBA

Students are in hospitals for clinical experience for one day per week for 17 weeks and full-time for four weeks during the month of May.

Level 2 September to December (15 weeks)

		hrs/wk	credits
BHSC 2213	Anatomy and Physiology	4.0	2.0
MRAD 2200	Clinical Education 2	11.5	11.5
MRAD 2201	Radiographic Procedures 2	7.0	5.0
MRAD 2203	Radiographic Technique and Evaluation 2	4.0	2.5
MRAD 2204	Radiographic Anatomy and Physiology 2	4.0	2.0
MRAD 2205	Case Studies 1	3.0	2.0
MRAD 2207	Pathology 1	3.0	2.0
MRAD 2212	Medical Imaging 2	2.0	1.5
NURS 2180	Patient Care 2	6.0	2.5
PHYS 2272	Physics: Medical Radiography	5.0	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)

		hrs/wk	credits
BHSC 2241	Human Behaviour*	3.0	1.5
COMM 1372	Communication for Medical Radiographers*	4.0	2.0
MRAD 3300	Clinical Education 3*	35.0	16.0
MRAD 3301	Radiographic Procedures 3*	4.0	2.0
MRAD 3303	Radiographic Technique and Evaluation 3*	3.0	1.5
MRAD 3304	Radiographic Anatomy and Physiology 3*	3.0	1.5
MRAD 3305	Case Studies 2*	3.0	1.5
MRAD 3307	Pathology 2*	3.0	1.5
MRAD 3308	Radiation Biology and Protection*	3.0	1.5
MRAD 3309	Special Procedures*	3.0	1.5
MRAD 3312	Medical Imaging 3*	3.0	1.5

*denotes a half-term course

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)

		hrs/wk	credits
MRAD 4400	Clinical Education	30.0	66.0

Level 5
January to April (17 weeks)

		hrs/wk	credits
MRAD 5500	Clinical Education	30.0	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 MRAD — Presents a systematic study of the basics of human anatomy and physiology that 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 Behaviour 1 Medical Radiology — Begins with organizational behaviour 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 Education 1 — Orients students 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 1 — Introduces the field of radiography, 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 1, 2 and 3 — Reviews 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 1, 2 and 3 — Presents a detailed study 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 that are pertinent to radiographic procedures. Prerequisite: BHSC 1113/2213.

MRAD 2200/3300 (MRAD 200/300) Clinical Education 2 and 3 — Provides students with 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 — Covers the radiographic procedures related to the digestive, urinary and biliary systems and the thoracic cage. 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 1 and 2 — 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 — Introduces students 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 — Continues 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. Prerequisite: MRAD 1102.

MRAD 3301 (MRAD 301) Radiographic Procedures 3 — Presents the skull 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 2201.

MRAD 3307 (MRAD 307) Pathology 2 — Follows from MRAD 2207 and 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. Prerequisite: MRAD 2207.

MRAD 3308 (MRAD 308) Radiation Biology and Protection — Begins 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) Special 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 2212 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. Prerequisite: MRAD 2212.

MRAD 4400/5500 (MRAD 400/500) Clinical Education 4 and 5 — Provides the student with 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 1 — 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 2 — 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: NURS 1180.

PHYS 1272/2272 (PHYS 110/210) Physics: Medical Radiography 1 & 2 — 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 (604) 432-8743.

Faculty and Staff

Verna Magee Shepherd, M.Sc., CHE, Associate Dean
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Louise Kallhood, A.C.R.
Lions Gate Hospital
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Royal Columbian Hospital
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Royal Inland Hospital
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Joanne Peterson, R.T.R.
University Hospital, UBC Site
T.B.A.
Vancouver Hospital and Health Sciences Centre
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 element 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 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 $38,500 per annum.

HEALTH SCIENCES

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 currently affiliated with the program.

The student will spend Levels 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 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.

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 who will assess applicants' suitability for the field and their communication skills.

Successful 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.

Degree Completion

Simon Fraser University grants two years credit towards a Bachelor of Science degree to graduates of this program.

Professional Association Registration

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.

Accreditation

The program is accredited by the Canadian Medical Association Diagnostic Imaging in Medical Radiation Technology Conjoint Committee for Accreditation.

Program: NUCLEAR MEDICINE TECHNOLOGY

Level 1			hrs/wk	credits
BHSC	1106	Anatomy and Physiology 1	5.0	5.0
BHSC	1126	Medical Microbiology and Immunology	2.0	2.0
CHEM	1116	Chemistry 1 for Nuclear Medicine Technology	4.0	4.0
MATH	1751	Basic Technical Mathematics for Nuclear Medicine	4.0	4.0
MLAB	1116	Clinical Laboratory Orientation	3.0	3.0
NMED	1020	Radio-pharmaceuticals 1	4.0	4.0
NMED	1040	Introduction to NMT	2.0	2.0
PHYS	1274	Physics for Nuclear Medicine 1	6.0	6.0

Level 2			hrs/wk	credits
BHSC	2206	Anatomy and Physiology 2	4.0	5.5
CHEM	2216	Chemistry 2 for Nuclear Medicine Technology	4.0	5.5
MATH	2751	Statistics for Nuclear Medicine Technology	3.0	4.0
NMED	2020	Radio-pharmaceuticals 2	4.0	2.5
NMED	2030	Radioassay Procedures	4.0	2.5
NMED	2040	Applied Physiology 1	2.0	2.5
NMED	2050	Radiobiology and Protection	2.0	2.5
NURS	1181	Patient Care	3.0	4.0
PHYS	2274	Physics for Nuclear Medicine 2	8.0	10.5

Summer (12 weeks)

NMED	2090	Clinical Experience 1	30.0	24.0

Level 3				
BHSC	3306	Pathophysiology 1	5.0	3.0
NMED	3010	Image Display	3.0	2.0
NMED	3040	Applied Physiology 2	17.0	9.0
NMED	3080	Clinical Experience 2	35.0	14.0
PHYS	3274	Physics for Nuclear Medicine 3	6.0	3.0

Level 4				
BHSC	1439	Human Behaviour	3.0	2.0
BHSC	4406	Pathophysiology 2	3.0	2.0
COMM	1474	Communication for NMT	4.0	2.5
NMED	4040	Applied Physiology 3	15.0	9.5
NMED	4080	Clinical Experience 3	32.0	20.0
PHYS	4274	Physics for Nuclear Medicine 4	5.0	3.0

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Summer (15 weeks)	hrs/wk	credits
NMED 4090 Clinical Experience 4	30.0	28.0

* 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 NMED — Examines 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 NMED — 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 Behaviour NMED — Introduces 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 NMED — Continues from BHSC 106 and covers the cardiovascular, lymphatic, respiratory, digestive, urinary and reproductive systems. Emphasis is placed on homeostatic control systems. Prerequisite: BHSC 1106.

BHSC 3306/4406 (BHSC 306/406) Pathophysiology 1/2 NMED — Introduces 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 — 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 — Introduces 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 1116.

COMM 1474 (HCOM 114) Communication for Nuclear Medicine Technology — 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 and 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. Prerequisite: MATH 1751.

MLAB 1116 Clinical Laboratory Orientation — Introduces 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 — Presents 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.

NMED 1040 (NMED 104) Introduction to Nuclear Medicine Technology — Presents 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 2020 (NMED 202) Radiopharmaceuticals 2 — Discusses the clinical application and specific radiopharmaceuticals on a systemic basis. Prerequisite: NMED 1020.

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 — Presents 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 — Requires 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 — Instructs the student in all aspects of current applied physiology including criteria, methodology, instrumentation, patient problems and approach, data collection and manipulation. Prerequisite: NMED 2040.

NMED 3080 (NMED 305) Clinical Experience 2 — See NMED 2090. Prerequisite: NMED 2090.

NMED 4040 (NMED 404) Applied Physiology 3 — Continues from 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. Prerequisite: NMED 3040.

NMED 4080 (NMED 405) Clinical Experience 3 — See NMED 2090. Prerequisite: NMED 3080.

NMED 4090 (NMED 409) Clinical Experience 4 — See NMED 2090. Prerequisite: NMED 4080.

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 — Reviews 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 1174.

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, PET, G.M. counters, proportional counters, ionization detectors, liquid scintillation counting, semiconductor detectors and thermoluminescent detectors. Prerequisite: PHYS 3274.

Faculty and Staff

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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 technical skills. Although a highly demanding 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 $39,031 - $48,352/annum (April 1995). Additional payment is received for shift work, charge positions and additional educational qualifications.

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HEALTH SCIENCES

Nursing continued from page 217

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. Students are videotaped in communication practice sessions. Learning opportunities include independent study, lectures, laboratories, tutorials and practicums with patients and families in extended care, surgical, medical, obstetrical, pediatric and psychiatric units. Students practice selected nursing techniques on each other in a supervised laboratory setting.

The first year of the program is also offered at one access college: East Kootenay College. Upon successful completion of the first year, students automatically transfer 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 region, 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 self-directed, 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, composed 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.

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 completed one of the Grade 12 required science courses or a higher level science course within the last five years (C+ minimum).

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. Applicants should contact BCIT Medical Services if they have questions related to whether or not their level of health is compatible with the requirements of the Nursing program.

E. Interview:

A satisfactory interview with a member of the Nursing department who will discuss 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 written and verbal 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 past five 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.

Expenses

In addition to tuition fees, students will spend approximately $1,250 for textbooks, modules 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.

HEALTH SCIENCES

Advanced Education Specialization

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.

Advanced Nursing

Advanced Nursing Specialty programs are offered through Health Part-time Studies in Critical Care, Emergency, Neonatal, Nephrology, Neurosciences, Pediatric, Pediatric Critical Care, Obstetrical, Occupational Health and Operating Room Nursing.

Bachelor of Health Science, Nursing

Completion of an Advanced Diploma in any of the specialties provides eligibility to gain an BHSc., Nursing through the Open Learning Agency also through distance education.

Bachelor of Technology in Nursing

BCIT has received degree granting status and will be offering a Bachelor of Technology in Nursing (Critical Care).

For detailed information, contact Health Part-time Studies, BCIT, 3700 Willingdon Avenue, Burnaby, B.C., V5G 3H2, or call (604) 439-4100.

Degree Completion at Other Universities

Most universities in major cities offer Bachelor of Nursing programs for graduates from diploma programs. All B.C. universities with diploma completion programs in Nursing recognize the BCIT diploma in Nursing and grant up to two years credit towards a baccalaureate degree in Nursing.

Professional Registration Association

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 Canadian Nurses Association Testing Service (*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.
*(1995-CNATS fee is $198.)

*Nursing is currently under curriculum review. There may be adjustments to the courses described below.

Program: NURSING

Level 1 (17 weeks)			hrs/wk	credits
BHSC	1105	Anatomy and Physiology	3.0	3.5
BHSC	1118	Personal Fitness Management	2.0	2.0
BHSC	1140	Human Development 1	3.0	3.5
NURS	1100	Nursing 1: Theory/Practicum	21.0	25.0
		or		
NURS	1101	Nursing 1: Theory and	21.0	25
NURS	1102	Nursing 1: Practicum	13.0	15.0
NURS	1110	Becoming a Master Student	2.35	2.5

Level 2 (17 weeks)				
BHSC	1239	Sociology	3.0	1.5
BHSC	2205	Physiology	3.0	3.5
BHSC	2227	Microbiology	2.0	2.0
BHSC	2240	Human Development 2	3.0	1.5
NURS	2100	Nursing 2: Theory/Practicum	21.0	24.0
		or		
NURS	2101	Nursing 2: Theory and	8.0	9.0
NURS	2102	Nursing 2: Practicum	13.0	15.0

Level 3 (17 weeks)			hrs/wk	credits
BHSC	3328	Immunology	2.0	2.0
COMM	1376	Writing for Nurses	3.0	3.5
NURS	3100	Nursing 3: Theory/Practicum	22.0	25.0
		or		
NURS	3101	Nursing 3: Theory and	7.0	8.0
NURS	3102	Nursing 3: Practicum	15.0	17.0

Level 4 (17 weeks)				
NURS	4100	Nursing 4: Theory/Practicum	23.0	26.0
		or		
NURS	4101	Nursing 4: Theory and	7.0	8.0
NURS	4102	Nursing 4: Practicum	15.0	17.0

Level 5 (17 weeks)			
NURS	4500	Nursing 5: Theory/Practicum	42.0

Course Descriptions

BHSC 1105 Anatomy and Physiology NURS — Surveys the basic structure and function of human body systems. An introduction to the basic principles of genetics is also included.

BHSC 1118 Personal Fitness Management NURS — Combines 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 Human Development 1 Nursing — Begins with an initial treatment of the topic of death and loss, then 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 Sociology Nursing — Introduces the study of human behaviour. 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 behaviour. The relationship between behavioral sciences and problems of health care is examined.

BHSC 2205 Physiology Nursing — Presents a study of physiological regulation and control based on the fundamentals established in BHSC 1105. Prerequisite: BHSC 1105.

BHSC 2227 Microbiology Nursing — Provides an introduction to basic microbiological concepts, including the distinguishing characteristics of microorganisms, methods of controlling infectious diseases and host-parasite relationships. Prerequisite: BHSC 1105.

BHSC 2240 Human Development 2 Nursing — 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 Immunology Nursing — 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 2225, 2227.

COMM 1376 (COMM 1176) Writing for General Nurses — Allows nurses and student nurses, several hours each day, to complete assignments, document patient care, write letters and memos, prepare written information for clients, write procedures, complete reports and prepare oral presentations. This course teaches students the planning, writing and revising skills they need to perform these tasks efficiently and effectively.

NURS 1100 Nursing 1: Theory/Practicum — Offered in the first-level of the Nursing Diploma program, this course is an overview of the nursing curriculum. The student is introduced to basic concepts of the nursing model, nursing process, nursing skills and professional behaviour. Emphasis is placed on the normal requirements for need satisfaction, the stressors associated with lifestyle patterns and assisting the individual by supporting appropriate responses. Principles of pharmacology are discussed. Concurrent theory, laboratory and practicum focus on basic assessment, interactive and psychomotor skills. A practicum is provided in medical and extended care units and community agencies. Students are expected to provide care to two individuals.

NURS 1101 Nursing 1: Theory — Offered in the first term of the Nursing program. Students are admitted with permission of the Chief Instructor. The course presents an overview of the nursing curriculum. Basic concepts of the nursing model, nursing process, nursing skills and professional behaviour 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 Nursing 1: Practicum — 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. A practicum is provided with adults on medical and extended care units. Students are expected to provide care to individuals. Prerequisite: GNNU 1101.

NURS 1110 Becoming a Master Student — 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 Nursing 2: Theory/Practicum — Presents 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 practicum 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. A practicum experience will be provided in hospital settings on adult general medical and surgical units. Students are expected to provide care for two to three individuals. Prerequisite: NURS 1100, BHSC 1105, 1140.

NURS 2101 Nursing 2: Theory — Offered in the second level of the Nursing program. Students are admitted with permission of the 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 Nursing 2: Practicum — 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. A practicum is provided in hospital settings with adults on general medical and surgical units. Students are expected to provide care for two to three individuals. Prerequisite: NURS 2101, BHSC 1105 and 1140.

NURS 3100 Nursing 3: Theory/Practicum — Presents 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 practicum 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. A practicum is provided in hospitals on family-centred units and pediatric units. Students are expected to provide care for two to three pediatric patients and a maximum of four maternity patients and their neonates. Prerequisite: NURS 2100, BHSC 2205, 2227, 2240.

NURS 3101 Nursing 3: Theory — Offered in the third term of the Nursing program. Students are admitted with permission of the 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 Nursing 3: Practicum — 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. A practicum is provided on family-centred maternity and general pediatric units. Students are expected to provide care for two to three pediatric patients and a maximum of four maternity patients and their neonates. Some experience is provided in the labour and delivery unit. Prerequisite: NURS 3101.

NURS 4100 Nursing 4: Theory/Practicum — 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 practicum focus on the nursing measures required to assist individuals to satisfy needs. A practicum is provided with adults on acute psychiatric, medical and surgical units. Students are expected to provide care for two to four individuals. Prerequisite: NURS 3100, CPR (Level C), BHSC 3328.

NURS 4101 Nursing 4: Theory — Offered in the fourth term of the Nursing program. Students are admitted with permission of the 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 Nursing 4: Practicum — 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. A practicum is provided with adults on acute psychiatric, medical and surgical units. Students are expected to provide care for two to four individuals. Prerequisite: NURS 4101.

NURS 4500 Nursing 5: Theory/Practicum — 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. A practicum is provided with adults on medical and surgical units. Working with a preceptor, students are expected to provide care for four to six 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, BCIT, 3700 Willingdon Avenue, Burnaby, B.C. V5G 3H2 or call (604) 439-4100. These courses are offered in Fall, Winter and Spring terms.

Faculty and Staff

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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 professional plays a major role in the development and application of safety training programs for workers, accident investigations and loss 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, government, and regulatory agencies where the health and safety of workers is of concern, as well, many graduates are finding employment as consultants.

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.

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 five years prior to application.

Program: OCCUPATIONAL HEALTH AND SAFETY

Level 1 (15 weeks)			hrs/wk	credits
BLAW	1100	Introductory Law for OCHS	1.5	1.5
BUSA	1610	Microcomputer Software 1	3.0	3.0
CHEM	1115	Chemistry 1 for OCHS	6.0	6.0
COMM	1188	Communication 1 for OCHS Professionals	3.0	3.0
MATH	1881	Basic Mathematics for OCHS	4.0	4.0
OCHS	1143	OCHS Legislation	2.5	2.5
OCHS	1161	Principles of Loss Management	5.0	5.0
PHYS	1288	Applied Physics 1 for OCHS	5.0	5.0

Level 2 (20 weeks)				
BHSC	1207	Anatomy and Physiology	2.0	2.5
BUSA	2610	Software Systems	3.0	4.0
CHEM	2215	Chemistry 2 for OCHS	5.0	6.5
COMM	2288	Communication 2 for OCHS Professionals	3.0	4.0
MATH	2881	Statistics for OCHS	4.0	5.5
OCHS	1262	Hazardous Materials Management	3.0	4.0
OCHS	2272	Safety Engineering and Training	5.0	6.5
PHYS	2288	Applied Physics 2 for OCHS	5.0	6.5

Level 3 (20 weeks)				
CHEM	3315	Organic Chemistry for OCHS	6.0	6.0
COMM	3388	Advanced Communication for OCHS	4.0	4.0
ENVH	3350	Noise and Vibration	5.0	TBA
HRMG	3220	Industrial Relations for OCHS	3.0	3.0
OCHS	1555	Environmental Management	3.0	3.0
OCHS	3359	Risk Management	3.0	3.0
OCHS	3371	Safety in the Workplace	3.0	3.0
OPMT	1381	Ergonomics	3.0	3.0

Level 4			hrs/wk	credits
CHEM	4418	Industrial Chemistry for OCHS	3.0	4.0
CHSC	1488	Engineering Concepts for OCHS	4.0	5.5
COMM	4488	Writing Safety Program Reviews	2.0	2.5
FMGT	1154	Accounting for Health Managers	3.0	2.0
HRMG	3060	Human Resource Management	4.0	2.5
OCHS	1460	Fire Prevention and Security	4.0	5.5
OCHS	3450	Occupational Hygiene	7.0	9.0
OCHS	4458	Safety Program Review	6.0	8.0

Course Descriptions

BHSC 1207 (BHSC 407) Anatomy and Physiology OCHS — Presents 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 that attend extreme changes in various work environments.

BLAW 1100 (ADMN 484) Introductory Law for OCHS — Introduces the Canadian legal system including its development, constitutional law, the Charter, torts, contracts and business relationships.

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. Prerequisite: BUSA 1610.

CHEM 1115 (CHEM 115) Chemistry 1 for OCHS — Introduces 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 is related to principles such as acid base, oxidation-reduction, electrochemistry, stoichiometry, equilibrium, chemical bonding, simple thermodynamics, etc., that 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 3315.

CHSC 1488 (CHSC 288) Engineering Concepts for OCHS — 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.

COMM 1188 (HCOM 112) Communication 1 for OCHS Professionals — Introduces students to the communication needs of professionals working in the OCHS field. It includes organizing information, writing public relations letters, procedures and literature reviews. Students also deliver a short oral training session on an OCHS topic.

COMM 2288 (HCOM 212) Communication 2 for OCHS Professionals — Builds on skills learned in COMM 1188 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 on an OCHS topic. Prerequisite: COMM 1188.

COMM 3388 (HCOM 312) Advanced Communication for OCHS — Complements the Safety Program Review (SPR) course completed 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 SPR. They also present their findings to industry contacts, the OCHS program head, communication instructor and classmates. Students will work with industry representatives, and BCIT staff while conducting interviews for their mini-audits. Prerequisite: COMM 2288.

COMM 4488 (HCOM 412) Writing Safety Program Reviews — Assists students with their industry Safety Program Review (SPR), design, layout, editing and packaging. Students present their final SPR orally and in writing to their industry contacts, the instructor and the OCHS Program Head. Students work with industry representatives, handle correspondence, conduct interviews and analyze data before reporting their findings in a professional SPR. Prerequisite: COMM 3388.

ENVH 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.

ENVH 3450 Occupational Hygiene — Allows the student to identify, monitor, evaluate and recommend control measures for common chemical and physical hazards in the workplace. It also provides the student with an overview of occupational diseases, causes and prevalence, methods of spread and prevention. Explores concepts of permissible levels, radiation, temperature and pressure extremes, contaminated water and food supplies, asbestosis, silicosis and white finger disease. Prerequisite: MATH 2881, PHYS 2288.

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 OCHS — Provides students with a working knowledge of recruitment and selection performance appraisals, job evaluations and job descriptions.

HRMG 3220 (ADMN 333) Industrial Relations for OCHS — Presents 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 — Presents 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 — Covers 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.

HEALTH SCIENCES

OCHS 1143 (OH&S 142) OCHS 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, motivation, the problem employee and off-the-job safety.

OCHS 1262 Hazardous Materials Management — Examines chemical safety and the legislation regulating hazardous materials in both the workplace and the environment. Topics include chemical hazards, WHMIS, transportation of dangerous goods, emergency preparedness, disaster planning, asbestos management and lead abatement.

OCHS 1460 (OH&S 464) Fire Prevention 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. Includes security considerations such as threat assessment, physical and electronic barriers, key control, security lighting, data security, robbery, shoplifting and guard services.

OCHS 1555 Environmental Management — Examines environmental law in Canada and explores current trends including air, water, and soil quality, waste management and hazardous site remediation.

OCHS 2272 (OH&S 271) Safety Engineering & Training — Explores the technical aspects of safety. It deals with safety principles, standards and training in areas such as lockout, confined space entry, guarding of equipment, electrical safety, mobile equipment, fall prevention and environmental considerations.

OCHS 3359 (OH&S 359) Risk Management — Deals with the concepts of loss control and risk management. It covers definitions, methods of identifying, evaluating and predicting risk, parameters for reducing or eliminating risk, principles of insurance, how to obtain the most cost-effective insurance coverage, cost benefit analysis, product liability and how to measure the state of safety in an organization.

OCHS 3371 Safety in the Workplace — Explores safety in specific industrial settings including construction, forestry and lumber, manufacturing, materials handling and transportation, health care, mining and chemical plants. Visits to these work sites provide students with first-hand knowledge of the hazards encountered in industry.

OCHS 4458 (OH&S 458) Safety Program Review — Presents a practical, hands-on project to evaluate the state of safety in an organization. Students conduct a complete Safety Program Review of an industrial firm and produce a report complete with recommendations for improvement and an implementation plan. Prerequisite: COMM 3388.

OPMT 1381 (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 1 for OCHS — Studies basic physical principles and applies them to relevant situations in the OCHS technology. Most of the course is mechanics, followed by a section on properties of matter. Topics in mechanics include kinematics, vectors, dynamics, statics, friction energy, momentum and simple machines. Properties of matter deals with elasticity and strength of materials. Problem analysis and problem-solving techniques are stressed. The accompanying lab program emphasizes careful measurement techniques, data analysis and concise report writing.

PHYS 2288 (PHYS 226) Applied Physics 2 for OCHS — Covers areas of fluids, thermal physics, wave motion, sound, electricity and magneticism and electromagnetic radiation. Topics in fluids include fluid pressure, buoyancy, viscosity and fluid dynamics. Topics in thermal physics include kinetic theory, gases, specific and latent heat, thermal expansion, heat transfer and 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, CRSP., Program Head
Kathleen Bell, DOHS, CRSP

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 in private practice. Starting salaries are about $30,000 / annum, rising to about $50,000 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, 1996.

Program Length

Two years, full-time beginning in September 1996, alternating on even number years.

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.

Professional Association Registration

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.

Program: PROSTHETICS AND ORTHOTICS TECHNOLOGY

Level 1 (15 weeks)			hrs/wk	credits
BHSC	1110	Anatomy and Physiology 1	4.0	4.0
COMM	1184	Technical Writing for Prosthetics and Orthotics	3.0	3.0
MATH	1841	Basic Math for Prosthetics and Orthotics	4.0	4.0
PHYS	1284	Physics for Prosthetics and Orthotics	4.0	4.0
PROR	1100	Prosthetics and Orthotics 1	15.0	15.0

Level 2 (20 weeks)				
BHSC	1242	Behavioral Science	3.0	3.5
BHSC	2210	Anatomy and Physiology 2	4.0	4.5
BHSC	2211	Regional Anatomy 1	2.0	2.0
CHSC	1284	Materials Workshop	2.0	2.0
MATH	2841	Statistics for Prosthetics and Orthotics	1.0	2.0
PROR	2200	Prosthetics and Orthotics 2	14.0	16.0
PROR	2220	Biomechanics	3.0	3.5
PROR	2230	Practicum (3 weeks)	35.0	7.0

Level 3 (15 weeks)				
BHSC	3310	Pathology and Pathophysiology	3.0	3.0
BHSC	3311	Regional Anatomy 2	2.0	2.0
NURS	1183	Patient Care	2.0	2.0
PROR	3300	Prosthetics and Orthotics 3	19.0	19.0
PROR	3320	Biomechanics	2.0	2.0
PROR	3330	Applied Materials	2.0	2.0

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HEALTH SCIENCES

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Level 4 (20 weeks)			hrs/wk	credits
BHSC	4410	Applied Pathology	2.0	2.0
BMET	1482	Applied Electrical Fundamentals	2.0	2.0
COMM	2284	Technical Writing 2	3.0	
PROR	1401	Professional Ethics	3.0	3.0
PROR	4330	Practicum (4 weeks)	35.0	10.0
PROR	4400	Prosthetics and Orthotics 4	20.0	20.0
PROR	4410	Patient Assessment and Care	3.0	3.0
PROR	4420	Case Studies	6.0	

Course Descriptions

BHSC 1110 (BHSC 110) Anatomy and Physiology 1 PROR — Follows, together with BHSC 2210, 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) Behavioural Science PROR — Presents a series of lectures, discussions and planned experiences, to provide students with 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 behaviour, 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 PROR — Continues from 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 PROR — Follows, together with BHSC 3311, 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 PROR — Explores 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 PROR — Continues from 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 PROR — Investigates specific diseases frequently encountered by the orthotist/prosthetist. Prerequisite: BHSC 3310.

BMET 1482 (BMET 382) Applied Electrical Fundamentals — Teaches students about 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 1841.

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 1 for Prosthetics and Orthotics — Improves students' abilities 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 2 for Prosthetics and Orthotics — Continues from COMM 1184. Students learn how to compose submissions to technical journals and research proposals. An oral presentation is also included. The emphasis is on communication applications in the prosthetics/orthotics field. Prerequisite: COMM 1184.

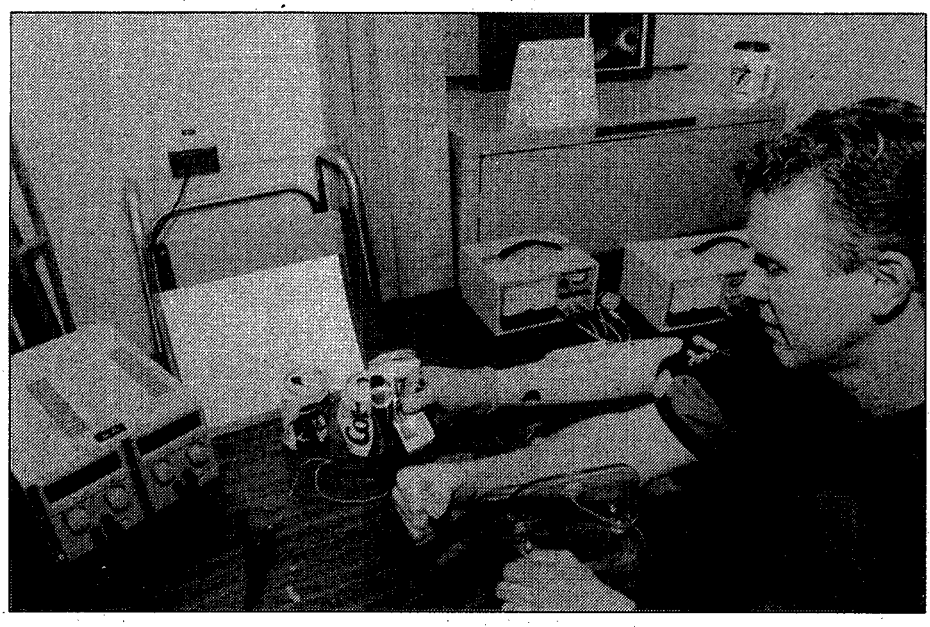
MATH 1841 (MATH 184) Basic Math for Prosthetics and Orthotics — Covers mensuration, formula manipulation; functions and graphs for linear, algebraic, power, exponential, logarithmic and trigonometric applications; oblique triangle solutions, angular motion; linear systems with an introduction to matrix algebra.

MATH 2841 (MATH 284) Statistics for Prosthetics and Orthotics 2 — Covers descriptive statistics with measures of central tendency, dispersion, skewness and kurtosis; probabilities, rules; Venn diagrams; Normal distribution. Prerequisite: MATH 1841.

NURS 1183 (GNNU 183) Patient Care — Instructs students 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 — 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.

HEALTH SCIENCES



PROR 2200 (P/OT 100) Prosthetics and Orthotics 2 — Treats the area of Lower Limb Orthotics in detail, with the aim of developing competence in assessment procedures, design and component selection, and construction of typical lower limb orthotics. Prerequisite: PROR 1100.

PROR 1401 (P/OT 401) Business Practices — Presents students with 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 1100 (P/OT 200) Prosthetics and Orthotics 1 — Examines the area of Trans-Tibial Prosthetics 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 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 — Covers normal human locomotion in detail. Examines force tolerance and mobility of the skeletal system 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 2230 (P/OT 202) Practicum — Provides students with 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 2200, 2220, BHSC 2210, 2211.

PROR 3300 (P/OT 301) Prosthetics and Orthotics 3 — Completes Lower Limb Prosthetics with the treatment of Syme's Trans-Femoral, and Total Leg Prostheses. Prerequisite: PROR 2230.

PROR 3320 (P/OT 320) Biomechanics — Examines force tolerance and mobility of the skeletal system 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 2230.

PROR 3330 Applied Materials — Presents an overview of the more sophisticated materials being introduced into the field, with particular emphasis on thermoplastics and carbon/epoxy composites. Various laboratory exercises in the forming and bonding of such materials complement the theoretical analysis of their characteristics and uses. Prerequisites: CHSC 1284 and PROR 2220.

PROR 4420 Cases Studies — Gives students the opportunities, under the guidance of practising Certifees, to assess patients in need of Prosthetic or Orthotic care, to design and fabricate suitable appliances, and to fit, adjust, and finish their products. Case presentations are then made, both orally and in writing. Prerequisite: PROR 3300.

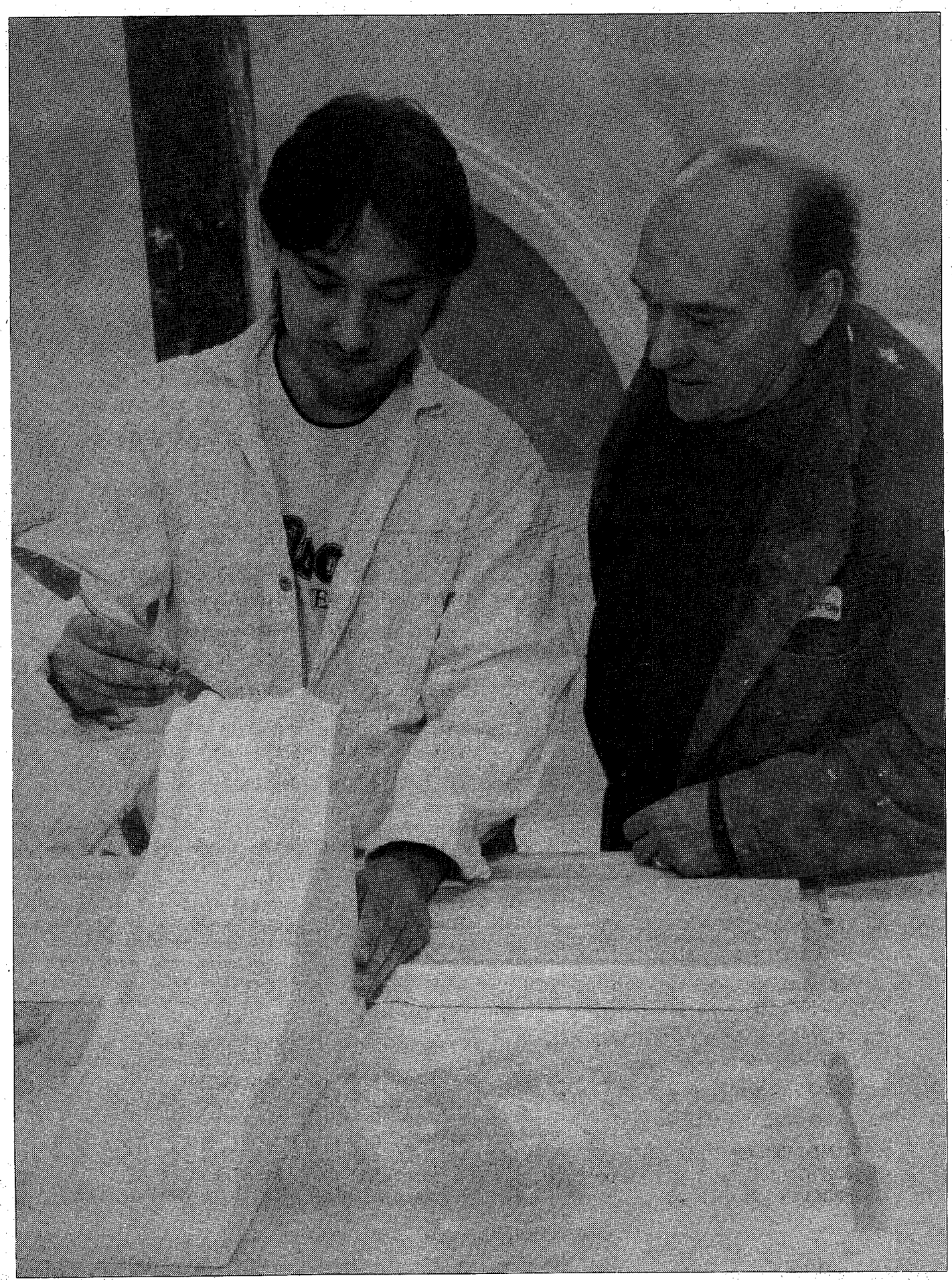
PROR 4330 (P/OT 402) Practicum — See PROR 2230. Prerequisite: PROR 3300, BHSC 3310.

PROR 4400 (P/OT 400) Prosthetics and Orthotics 4 — Covers the area of Spinal Orthotics 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 3300.

PROR 4410 (P/OT 410) Patient Assessment and Care — Teaches students, through a series of presentations and projects, how to evaluate patients from the viewpoint of functional loss and to 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. Prerequisite: PROR 3300.

Faculty and Staff

M. Bernadet Ratsoy, B.Sc.N., M.Sc., R.N., Associate Dean
Bill McGuiness, M.A., C.P.O., Program Head
Silvia Raschke, B.A., C.O. (on leave)



TRADES TRAINING

SCHOOL OF TRADES TRAINING

TRADES TRAINING

ADMINISTRATION

Office of the Dean

Raymond Walton, B.A.Sc., M.Sc., N.Eng., Dean

Fresh Start

Aviation Training

Dave Mitchell, A.M.E., Associate Dean

Aircraft Electronics Technician (Avionics)
Aircraft Gas Turbine Technician
Aircraft Maintenance Engineer (M.)
Aircraft Structures

Construction and Metal Industries Training

Rod MacNeill, Ed.D., M.B.A., Associate Dean

Boilermaking
Carpentry
Drafting
Ironworking
Joinery (Cabinetmaker)
Painting and Decorating
Plumbing
Sheet Metal Working
Steamfitting
Steel Fabricating
Welding

Industrial Mechanical Industries Training

Kate Pelletier, B.Ed., M.R.E., Associate Dean

Computer Numerical Control (CNC) Machinist
CNC Programmer
Advanced CNC Programmer
Heating, Ventilation, Air Conditioning and Refrigeration Technician (HVAC & R)
Industrial Maintenance Mechanic
Machinist
Millwright
Power Engineering
- General Program
- Technical Program

Power and Process Engineering-3rd Class
Refrigeration Mechanic
Tool and Die Technician

Pacific Marine Training Campus

Roman Piechocki, Associate Dean

Marine Engineering Programs
Fourth Class Marine Engineer
Third Class Marine Engineer
Second Class Marine Engineer
First Class Marine Engineer

Marine Engine Room Simulator Training
Level I - Watchkeeper and Control Room Operator
Level II - Plant Manager
Familiarization Continued Proficiency Certificate

Marine Engineer Professional Development and Other Courses
Math Correspondence
Marine Engineer Programmable Logic Controller (PLC)
Marine Engineer Electrical Generator Systems
Marine Engineer Pneumatic Controls Familiarization
Marine Engineer Hydraulics
Marine Engineer Machine Tools and Hand Skills Training
Marine Engineer Computer-based Condition Monitoring and Data Acquisition Techniques

Nautical Programs
Watchkeeping Mate
Command Endorsement
Ocean Navigator II
Ocean Navigator I
Master Mariner
Master, Minor Waters

Fishing Industry Programs
Fishing Master Class IV
Fishing Master Class III
Fishing Master Class I and II

Electronic Navigation Courses
SEN IA - Navigation Instruments
SEN IB - Basic Radar Simulator
SEN II - Advanced Radar Simulator
ARPA -Automatic Radar Plotting Aids

Safety and Seamanship Programs

Marine Emergency Duties
Marine Emergency Duties A-1: Basic Safety Course
Marine Emergency Duties A-2: Small Vessel Safety Course
Marine Emergency Duties B-1: Survival Craft Course
Marine Emergency Duties B-2: Marine Fire Fighting Course
Marine Emergency Duties C: Officer Certification Course
Marine Emergency Duties D: Senior Officer Course
Basic Offshore Survival Endorsement Course - BOSC

Deckhand Training Program
Deckhand Training
Net Mending

Tanker Safety Courses
Supervisor of Oil Transfer Operations
Advanced Petroleum Tanker Safety Course

Standard First Aid Training

Shipping and Marine Operations

Transportation Training

Ron Evans, Associate Dean

Auto Collision Repair/Refinishing
Automotive Electronics Technician
Automotive Mechanic
Automotive Service Technician
Commercial Transport Mechanic
Diesel Electronics
Diesel Engine Mechanic
Heavy Duty Mechanic
Inboard/Outboard Mechanic
Motorcycle Mechanic
Power Equipment Mechanic

Apprenticeship Training

See page 10.

For Information Sessions held throughout the year, contact Student Services at (604) 434-3304.

TRADES TRAINING

FRESH START

The Program

This 19-week technical literacy program provides academic upgrading in an applied setting for students wishing to enter a trades/technical program at BCIT. Fresh Start provides training in applied math, physics, communications, computers and study skills. The program accepts students who have written the pre-entry math and reading test for trades and who are at least two grade equivalents from the prerequisite. The objective is to provide students with the skills they will need to successfully complete a trades/technical program.

Fresh Start is offered twice a year with intakes in September and February.

Students enrolled in the Fresh Start program are provisionally accepted (at the time of enrolment) into their selected trades/technician program, subject to satisfactory completion, which starts subsequent to their completion.

For further information on the Fresh Start program, please call the department at (604) 451-6849.

Program Length

19 weeks, full-time.

Normal Course Hours

0800-1500, Monday through Friday.

Prerequisite

The program accepts students who have written the pre-entry math and reading test for trades and who are at least within two grade equivalents from the prerequisite.

Instructors

Francis Atkinson
Ewan Sheard

AVIATION PROGRAMS

The occupational standards and the training standards for the 13 trades in the aviation industry are currently under a national review by a joint industry, government and school association known as C.A.M.C. (Canadian Aviation Maintenance Council). The results are expected to lead to more formal and recognizable national and international trade certification. BCIT is an integral part of these ongoing studies and improvements and will ensure that any changes are reflected in our curriculum and training standards.

AIRCRAFT ELECTRONICS TECHNICIAN (AVIONICS)

Diploma of Trades Training

Aviation Electronics Technicians (Avionics) are responsible for the servicing, repair and modification of aircraft electronic systems and components. It is a responsible job that includes a variety of tasks from removing and installing components to bench testing and troubleshooting complex electronic aircraft systems. Today's aircraft can be quite sophisticated with "fly by wire", auto flight, global positioning satellite navigation, inflight entertainment, and automatic communication and receiving systems.

Job Opportunities

Employment opportunities are available across Canada in aviation electronic shops, helicopter operations, and large and small carriers. Other opportunities such as fixed-based airport equipment servicing are also available. Upon completion of approved training, graduates can expect to work in industry as an apprentice for 18 months, and then as an avionics technician.

The Program

This 16-month program is designed to follow a National/International set of standards and is approved by Transport Canada. Graduates may be credited with 18 months experience towards the 36 months industry experience required by Transport Canada. The students will attend lectures approximately 50% of the time, while gaining hands-on experience 50% of the time. The course is conducted in a large, well-equipped hangar at the Vancouver International Airport. The campus has a well-equipped electronics shop and more than 18 aircraft to work on. The student will perform a variety of tasks from basic soldering techniques to troubleshooting for faults at the bench and on the aircraft.

Program Content (Program currently under review; curriculum may be subject to change)

AVAM 1104 General Aircraft Practices
AVAM 1107 Mechanics of Flight, Structures
AVAV 1112 Aircraft Electrical Systems
AVAV 2212 Aircraft Mechanical Systems 1
AVAV 2213 Aircraft Mechanical Systems 2
AVAV 2215 Aircraft Instruments
AVAV 3305 Avionics Installation
AVAV 3306 Radio Communications
AVAV 3307 Avionics Systems
AVAV 4405 Avionics Flight Line Maintenance
AVAV 4406 Navigation and Communications, Pulse
AVAV 4407 Avionics Techniques and Procedures

Program Length

16 months, full-time.

Normal Course Hours

0800-1530, Monday through Friday.

Prerequisites

Electronics Technician Common Core program or equivalent, plus High School graduation with Math 11 with C (Math 12 preferred) and English 12 (or equivalent) with a P. Good colour vision is essential.

Instructors

Doug Grant, A.M.E.
Vincent Murray, A.M.E.

AIRCRAFT GAS TURBINE TECHNICIAN
Certificate Program

Gas Turbine Technicians are responsible for the disassembly, inspection repair and reassemble of gas turbines. It is a responsible job with no room for error. They are able to work on a variety of engines from the smallest turbine (a supercharger) up to the largest turbine used on a B747 Aircraft. They can also repair pipeline, stationary and marine gas turbines as well as propellers and engine components.

Job Opportunities
Employment opportunities are available across Canada at gas turbine overhaul facilities. In the past, these facilities had difficulty filling positions, so were hiring aircraft mechanics and millwrights. With the start-up of this course in 1993 employers now have the opportunity to hire highly skilled staff specifically trained for their facility.

The Program
The program was designed, in consultation with industry advisors, to meet today's work standards. The students attend lectures 40% of the time and practical sessions 60% of the time. The course is conducted at BCIT's Aviation Campus at the Vancouver International Airport. The campus has a wide variety of gas turbines and tools/test equipment. Students will perform a selection of tasks ranging from basic hand tools to total disassembly/assembly of a gas turbine.

Program Content
AVAM 1104 General Aircraft Practices — Hand tools, blueprint reading, materials and processes. Hardware and plumbing, precision measuring instruments and Math.

AVGT 1113 Elementary Gas Turbines — Aero dynamics, gas turbine theory, physics, gas turbine construction and manufacturing, and propeller theory.

AVGT 1114 Systems/Overhaul Procedures — Gas turbine systems, engine instrumentation, engine operation, performance and testing, and basic electrical.

AVGT 1115 Overhaul Procedures — Inspection methods, repair techniques, nondestructive testing, corrosion control, balancing, documentation and reference

Program Length
21 weeks, (30 hours/week) full-time
Term 1: 5 weeks full-time
Term 2: 5 weeks full-time
Term 3: 5 weeks full-time
Term 4: 6 weeks full-time

Normal Course Hours
0800-1500, Monday through Friday.

Prerequisites
High school graduation with Math 11 or successful completion of the BCIT Pre-entry test, and successful completion of one of the following: Tech. Ed. 11, Gen. Mech. 11, Auto. Mech. 11 or Physics 11. Good colour vision is required, and an interest in mechanics is recommended. Mature students may be given special consideration, subject to interview and testing by instructional staff. For additional information see your high school counsellor, Technical Education teacher, or call BCIT Student Services at (604) 434-3304, or 1-800-667-0676 for enquiries from outside the Greater Vancouver area.

Instructor
Brian Proulx, A.M.E.

AIRCRAFT MAINTENANCE ENGINEER: CATEGORY M
Diploma of Trades Training

Aircraft Maintenance Engineers (A.M.E.) are responsible for the release (certification) of an aeronautical product (aircraft), after maintenance or repair. It is a responsible job which includes a variety of tasks from removing and installing components to troubleshooting complex systems. An A.M.E. is able to work on small aircraft, helicopters and large transports. The larger aircraft are quite sophisticated in that they may possess every system a small town might have, and the A.M.E. must be able to maintain them. They will work on electronic, electrical, pneumatic, hydraulic, mechanical and propulsion systems.

Job Opportunities
Graduates from the A.M.E. "M" program have, for the last 35 years, found employment in Canadian and foreign aviation industry. First as an apprentice for 30 months, then as an A.M.E. Some graduates have gone on to become managers and owners of domestic and international aircraft maintenance establishments. "Overall, through year 2005, aircraft mechanics — particularly those with work experience — are expected to have excellent job opportunities since the number of job openings is expected to exceed the supply of qualified applicants." (re: U.S. Department of Labour, Bureau of Statistics 1993). It is an exciting and rewarding industry with opportunity for travel and career development.

The Program
The program is designed to follow a national/international set of standards and is approved by Transport Canada. Graduates may be credited with 18 months experience towards the 48 months industry experience required by Transport Canada. The student will attend lectures approximately 40% of the time, while gaining hands-on experience 60% of the time. The course is conducted in a large, well equipped hangar at the Vancouver International Airport. The campus has a wide selection of tools/training aids, and more than 18 aircraft. The student will perform a variety of tasks, ranging from the use of basic hand tools and troubleshooting an aircraft, through the operation.

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 1 (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.

Normal Course Hours

0800-1530, Monday through Friday.

Prerequisites

High school graduation with Math 11, or successful completion of the BCIT Pretest, and one of the following: Tech. Ed. 11 (C+ minimum), Gen. Mech. 11 (C+ minimum), Automotive Mech. 11 (C+ minimum) or Physics 11 (Pass minimum). Good colour vision is required, and an interest in mechanics is recommended. Mature students may be given special consideration, subject to interview and testing by instructional staff. For additional information see your high school counsellor, Technical Education teacher, or call BCIT Student Services at (604) 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.
Trevor Castle, A.M.E.
John Edwards, A.M.E.
Robert Grasby, 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 TECHNICIAN

Certificate Program

Structures Technicians are responsible for the assessment, planning and implementation of aircraft structural fabrication and repairs. The Structures Technician is often an integral part of a repair crew consisting of Airframe and Avionics Technicians and professional engineers. He/she will be expected to precisely follow aircraft fabrication and repair schemes for aluminium, titanium and stainless steel structure, as well as plastics and composites.

Job Opportunities

Graduates from this program have found employment in a variety of companies in the aerospace industry across Canada. They are employed in small aircraft repair, airlines and manufacturers of components and aircraft. Some graduates have gone on to manage or own shops.

The Program

The program was designed, in consultation with industry advisors, to meet today's work standards. The student will attend lectures 40% of the time, while gaining hands-on experience 60% of the time. The course is conducted at BCIT's Aviation campus at the Vancouver International Airport. The campus has a wide selection of tools/training aids, and more than 18 aircraft. The student will perform a variety of tasks from basic shop procedures up to a complete repair or assembly of a component or an aircraft.

Program Content

Shop Practices
Shop Safety
  tools and equipment
  reference materials
  technical drawing
Introduction to Aircraft Structures
  aircraft nomenclature and structures
  theory of flight
Materials and Processes
  metallurgy
  corrosion control
  hardware and fasteners
Sheet Metal Construction
  sheet metal assembly
  sealing
Structural Damage Assessment Techniques
  damage assessment
  corrosion assessment
Structural Repairs
  sheet metal repairs
Composite Structures - Fabrication
  composite fabrication
Composite Structures - Repairs
  composite repairs
Specialty Practices
  wooden structures
  fabric coverings
  fluid lines and fittings
  transparencies
Air Regulations
  air regulations
  use of logbooks and forms
  defect report writing

Program Length

37 weeks, full-time.

Normal Course Hours

0800-1530, Monday through Friday.

Prerequisites

High School graduation with Math 11A or Aviation Trade Math or pre-entry test. Some drafting is recommended. Mature students may be given special consideration, subject to an interview and testing by instructional staff.

BCIT currently 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 Grade 12. For additional information see your high school counsellor, Technical Education teacher, or call BCIT Student Services at (604) 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.

TRADES TRAINING

CONSTRUCTION & METAL INDUSTRIES TRAINING

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. Possible work sites include pulp mills, refineries and hydro electric projects.

Job Opportunities
Training prepares students as boilermakers (erectors). Upon successful completion of the program, students may seek employment as apprentices.

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.

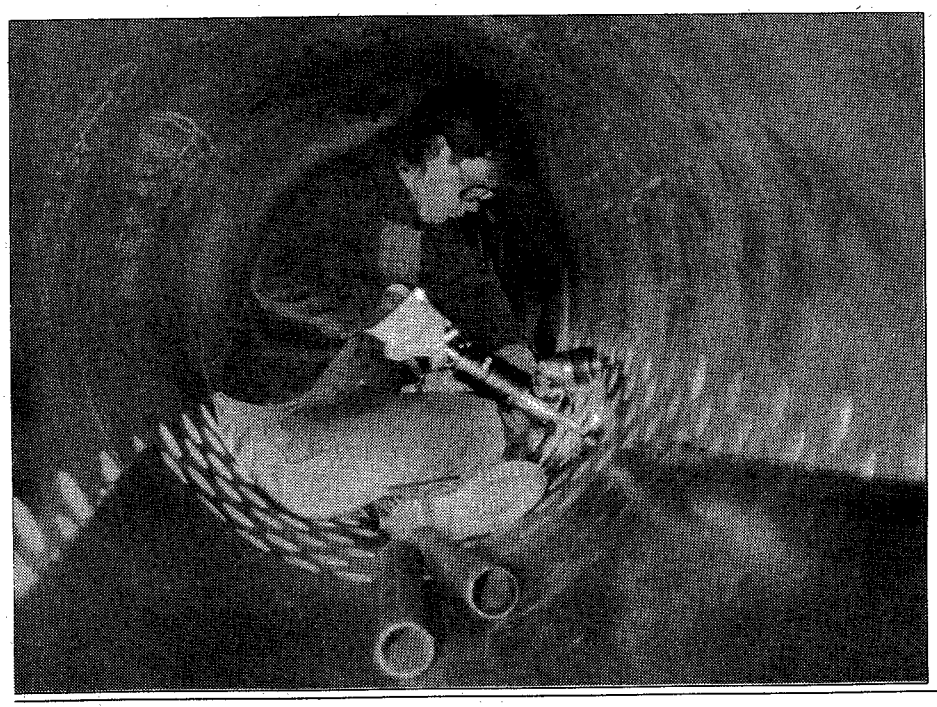
Program Content
Describe the boilermaking trade
Apply safe and acceptable work practices
Mathematics
Sketch and read drawings
Develop patterns and make templates for shop application
Use basic measuring, layout, hand and power tools
Use metal fabrication power equipment
Use oxyacetylene
Arc welding
Apply 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
0700-1330, Monday through Friday.

Prerequisites
Grade 10 or pretest. Department interview also required. Contact the Boilermaker Instructor at (604) 434-5734, local 5004 for an appointment. **Please note: Good physical condition is required for success in the Boilermaker trade.**

Instructors
Joe Kiwior
Richard MacIntosh
Nino Romanin, Chief Instructor



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 paneling 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:
wood framing
concrete forming
interior finishing
blueprint reading
installing cabinets and hanging doors
building stairs and railings
installing exterior siding
site preparation and layout.

Job Opportunities
The steady upturn in the construction industry has resulted in increased employment opportunities for carpenters. Most jobs are in the residential building, 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 may seek employment as apprentices.

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.

TRADES TRAINING

Program Content
Describe carpentry trade
Use safe work practices
Solve mathematical problems
Interpret drawings and specs
Use hand tools
Use portable power tools
Use shop equipment
Identify materials
Use rigging and hoisting equipment
Use site layout
Build concrete formwork
Use special construction
Frame residential housing
Describe insulation and energy conservation techniques
Apply finishing material
Use survey instruments
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.

Prerequisite
Grade 10 or pre-entry test.

BCIT currently has agreements with a number of school districts throughout the province that 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 and complete a related Career Preparation program with good grades. For additional information see your high school counsellor, Technical Education teacher, or call BCIT Student Services at (604) 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, Chief Instructor
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
R. Ainsworth, T.Q., I.P., Carpentry I.D.
Kal Klasen, T.Q., I.P., Carpentry, I.D.
Luigi Fontana, T.Q., Carpentry I.D.

DRAFTING
Certificate Programs

The Combined Drafting program offers four areas of specialization: Civil, Mechanical, Architectural and Structural. Applicants must indicate area of specialization on their application.

Career Preparation Graduates
BCIT currently has agreements with a number of school districts throughout the province that 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 and complete a related Career Preparation Program with good grades. For additional information see your high school counsellor, Technical Education teacher, or call BCIT Student Services at (604) 434-3304, or 1-800-667-0676 for enquiries from outside the Greater Vancouver area.

COMBINED DRAFTING PROGRAM: CIVIL, MECHANICAL, ARCHITECTURAL AND STRUCTURAL
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 (20 weeks) before proceeding to their drafting specialty (20 weeks). Total program length: 40 weeks.

Prerequisites
High School graduation with Math 11A or successful completion of the BCIT pretest. Good hand/eye coordination and technical aptitude. All students will enter and complete the Drafting Core. Students will then be channelled into their chosen drafting specialty (Civil, Mechanical, Architectural or Structural Drafting). Note: Applicants must state which drafting specialty they prefer when applying.

Program Length
40 weeks, full-time beginning September each year (20 weeks of the Drafting Core and 20 weeks of the Drafting Specialty).

Normal Course Hours
0700 to 1345, Monday through Friday.

Phase 1
Drafting Core (20 weeks total beginning in September each year).

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. It prepares the student to choose one of four 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.

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.

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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

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 that deal with reinforced concrete and structural steel, and steel fabrication companies.

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

4) Architectural Drafting — The specialty applies the basic drafting skills learned in the Core with architectural and design skills used in the construction of buildings.

Job Opportunities
Graduates may find entry level drafting positions in architectural firms, residential construction companies, or other firms requiring a mix of design and drafting skills.

Specialty Content
Combines architectural design with the skills required to produce working drawings.

Instructors
W. Chandler, Instructors Diploma
G. Cullen, B.A., B.Theol., Instructors Diploma
B. Hilliard, Instructors Diploma-Chief Instructor
R. Kinnell, Instructors Diploma

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 that 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 may seek employment as apprentices. 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. Potential students should arrange an interview with the Ironworker Instructor at (604) 451-6833.

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
0700-1330, Monday through Friday.

Prerequisite
Grade 10 or pre-entry test. A department interview is a requirement for this program. **Please note: Good physical condition is required for success in the Ironworker trade.**

Instructors
Nino Romanin, Chief Instructor
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 may seek employment as apprentices.

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, door, window and stairbuilding.

Program Content
Use safe work practices
Solve mathematical problems
Apply layout techniques
Care and use of hand tools
Identify woodworking joints
Describe portable power tools
Use woodworking machines
Identify materials
Use machining and assembly techniques
Apply a finish
Install millwork
Introduction to computing
Create shop drawings
Build practical projects
Prepare for employment

Program Length
28 weeks, full-time.

Normal Course Hours
0730-1415, Monday through Friday.

Prerequisite
Grade 12 graduation with English 12 or pretest.

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 currently has agreements with a number of school districts throughout the province that 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 and complete a related Career Preparation program with good grades. For additional information see your high school counsellor, Technical Education teacher, or call BCIT Student Services at (604) 434-3304, or 1-800-667-0676 for enquiries from outside the Greater Vancouver area.

Instructors
Erwin Bublitz, T.Q., Chief Instructor
Carl Catt, T.Q.
Dave Dunn, T.Q.
Ron Hill, T.Q.
Rob Sawatzky, B.Ed.
Dave Stimson, 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, such as pulp and paper mills, ships, bridges and tanks. 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, wages average $40,000+/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.

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, (604) 434-3304.

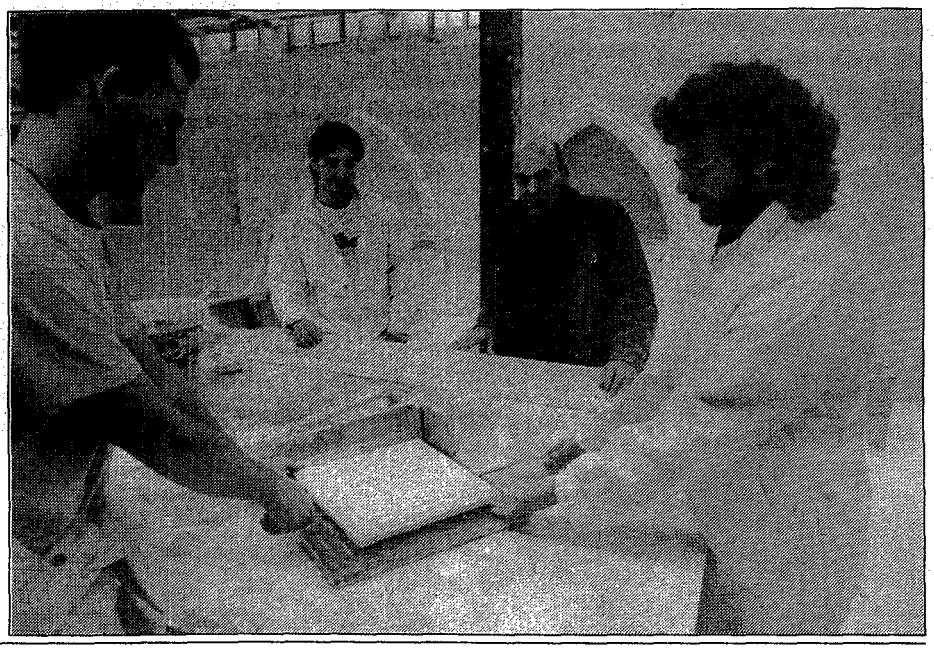
Program Content
General safety
Basic tools and equipment
Ladders and scaffolding
Basic paint technology
Colour mixing
Surface preparation
Coating procedures and application
Paint failure
Conventional spray finishing
Airless spray finishing
Decorative painting
Trade math and estimating
Preparation for employment

Program Length
20 weeks, full-time.

Normal Course Hours
0730-1430, Monday through Friday.

Prerequisite
Grade 10 or pre-entry test.

Instructor
David A. Lick



TRADES TRAINING

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 bylaws 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 must seek employment as apprentices.

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
30 weeks, full-time.

Normal Course Hours
0730-1415, Monday through Friday.

Prerequisite
Grade 12 graduation with English 12 or pretest.

BCIT currently has agreements with a number of school districts throughout the province that 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 and complete a related Career Preparation program with good grades. For additional information see your high school counsellor, Technical Education teacher, or call BCIT Student Services at (604) 434-3304, or 1-800-667-0676 for enquiries from outside the Greater Vancouver area.

Instructors
David Bowles, Chief Instructor
Bill Bradbury
Gary Clifford
Keith Colby
James Endert
William Evans
Bill Johnston
Bernie Koelzer
Ron Marier
John Masse
Gary Norgard
Dale Pfaff
Nick Potis
Tota Ram
Howard Rothenberg
Anne St. Eloi

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, aluminium, 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 may seek employment as apprentices.

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 nonunion 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
Use basic measurement and layout tools
Use power tools and shop equipment
Lift and support loads
Oxyacetylene cut and weld
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.

Prerequisite
Grade 10 or pre-entry test.

BCIT currently has agreements with a number of school districts throughout the province that 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 and complete a related Career Preparation program with good grades. For additional information see your high school counsellor, Technical Education teacher, or call BCIT Student Services at (604) 434-3304, or 1-800-667-0676 for enquiries from outside the Greater Vancouver area.

Instructors
Roger Hagan, T.Q.
Ted Kondo, T.Q., Sheet Metal I.D., Chief Instructor
Dave Stewart, T.Q., Sheet Metal I.D.
Gordon Torgerson, T.Q., Sheet Metal I.D.

STEAMFITTING
Certificate Program

Steamfitters/pipefitters install, alter, maintain and repair piping systems that 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 may seek employment as apprentices. 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

Program Length
30 weeks, full-time.

Normal Course Hours
0730-1415, Monday through Friday.

Prerequisite
Grade 12 Graduation with English 12 or pretest.

BCIT currently has agreements with a number of school districts throughout the province that 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 prerequisite and complete a related Career Preparation program with good grades. For additional information see your high school counsellor, Technical Education teacher, or call BCIT Student Services at (604) 434-3304, or 1-800-667-0676 for enquiries from outside the Greater Vancouver area.

Instructors
David Bowles, Chief Instructor
Bill Bradbury
Ron Marier
Bill Johnston
Anne St. Eloi

TRADES TRAINING

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 may seek employment as apprentices.

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
0700-1330, Monday through Friday.

Prerequisite
Grade 10 or pre-entry test.

BCIT currently has agreements with a number of school districts throughout the province that 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 and complete a related Career Preparation program with good grades. For additional information see your high school counsellor, Technical Education teacher, or call BCIT Student Services at (604) 434-3304, or 1-800-667-0676 for enquiries from outside the Greater Vancouver area, or contact the department at (604) 451-6833.

Instructors
Gary Blidook
Kevin Neustaedter
Nino Romanin, Chief Instructor
Terry Subtelny

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 Skills, Training and Labour. Welding programs are available in 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.

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

BCIT currently has agreements with a number of school districts throughout the province that 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 and complete a related Career Preparation program with good grades. For additional information see your high school counsellor, Technical Education teacher, or call BCIT Student Services at (604) 434-3304, or 1-800-667-0676 for enquiries from outside the Greater Vancouver area. For information on part programs please contact the Welding department directly at (604) 432-8203.

TRADES TRAINING

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

***Note:** P7 is mandatory. Students must do one of either P8, P9 or P10 to complete the practical parts of Level B.

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.

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.S.T.L. 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 at (604) 432-8203.

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 may 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
Eric Sukkel
Rod Walters
Eric Waterfield
Al Wood

INDUSTRIAL MECHANICAL INDUSTRIES TRAINING

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 who wish 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 (Program currently under review; course curriculum subject to change)
Safety (10 hours) — Covers application of proper manual lifting techniques, safe work practices and first aid procedures; compliance with rules governing the handling of hazardous materials.

Introduction to Computers (20 hours) — Covers the identification of microcomputer system components and use of basic commands to copy, delete, rename, etc.; application of editing operations to CNC programs.

CNC Training Machines (90 hours) — Covers writing and debugging simple CNC programs, operating the machine control panel, inputting and editing programs, setting up the machine and using proper operating procedures to produce small parts.

CNC Turning Centre (120 hours) — Covers 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) — Covers performing operations using the General Numeric Control; creation and use of MDI programs.

CNC Machining Centre (120 hours) — Covers 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.

Normal Course Hours
0700-1400, Monday through Friday.

Prerequisites
Applicants should have English 12 or successful completion of the BCIT pretest, 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 or department approval.

Instructors
Greg Burke, B.Ed., I.D., I.P.
Fred Shim, I.D., I.P., Mech. Tech.

CNC PROGRAMMER
Certificate Program

The objective of this 300-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.

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, maintaining complete and accurate documentation, and selection of the most appropriate machines for a designated job.

Program Content (under review)
Manual Programming (30 hours) — Presents an overview of the basic G-codes and follows 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) — Explains program structure, geometry definitions, cutting motions, toolchange statements, file management and plotting using a PC-based version of APT.

Macro Programming (20 hours) — Covers the use of the Fanuc control to program for measuring probes, families of parts, variable programming and logical operations.

Graphics Programming Two-dimensional (100 hours) — Covers the 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) — Covers 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) — Presents the 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) — Introduces 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
10 weeks, full-time.

Normal Course Hours
0700-1400, Monday through Friday.

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. English 12 or successful completion of the BCIT pretest. Other applicants must verify their level of competence for admission to the program through a formal interview with the department.

Instructor
Fred Shim, I.D., I.P., D.P.T.

CNC PROGRAMMER-ADVANCED
Certificate Program

This 300-hour advanced program will improve the programming skills of graduates of CNC Programmer. The advanced level includes applications of the UNIX system, macro and 3D 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 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 (under review)
UNIX (20 hours) — Introduces the UNIX operating system including commands, files and directory structures.

Macro Programming (20 hours) — Covers the production of various shapes using mathematical formulas (ellipses, spheres, etc.) and creation of macro programs for the use of positioning probes.

Graphics Programming Three-dimensional (130 hours) — Uses advanced features of CAM software to produce cutter paths in three dimensions for four and five-axis positioning mills. Application of wireframe geometry for building complicated models. Process for geometric projections onto surfaces and three-axis cutter compensation for 3D work.

Tool Life Management (20 hours) — Introduces adaptive controls for sensing the variations in machining conditions through torque, deflection, vibration, wear, etc.

Job Estimating (10 hours) — Covers 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
10 weeks, full-time.

Normal Course Hours
0700-1400, Monday through Friday.

Prerequisites
Applicants must be graduates of the CNC Programmer Course or from a recognized course from another institute or training facility. Other applicants must verify their level of competence for admission to the program through a formal interview with the department. English 12 or successful completion of BCIT pretest required.

Instructor
Fred Shim, I.D., I.P., D.P.T.

HEATING, VENTILATION, AIR CONDITIONING AND REFRIGERATION TECHNICIAN (HVAC & R)

Cooperative Diploma Program

Job Opportunities

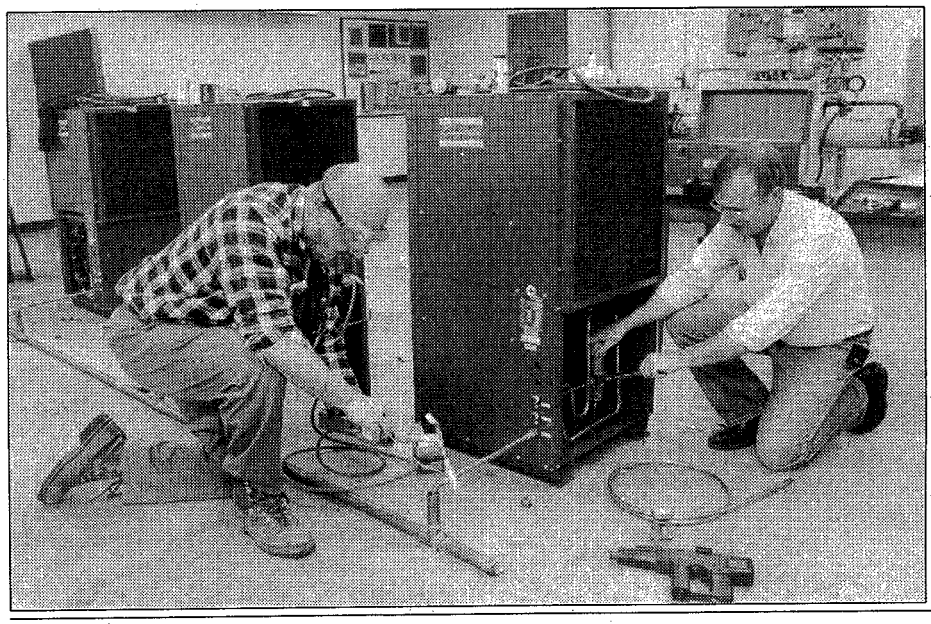
The Heating, Ventilation, Air Conditioning and Refrigeration Technician program will produce competent entry level tradespersons who are highly knowledgeable in all aspects of the HVAC & R industry. Graduates of this program will be prepared to enter and complete the existing Refrigeration Apprenticeship program with employers such as refrigeration wholesalers, commercial/industrial refrigeration contractors, air conditioning commercial contractors, HVAC & R controls, or one may find positions in building maintenance.

The Program

The Heating, Ventilation, Air Conditioning and Refrigeration (HVAC & R) Technician program provides a foundation in basic refrigeration system design, installation and service with an on-the-job experience component to support the institutional instruction. The course is two years in duration combining classroom and shop instruction with Cooperative Education experience in industry. The first year is devoted to Direct Refrigeration Systems. The second year includes a broad range of topics focused on HVAC systems design, operation and controls. Emphasis will be placed on diagnosis and service requirements and procedures.

Program Content

Apply effective learning techniques
Apply trade safety practices
Process technical information
Apply principles of technology
Apply trade tools and fasteners
Apply fundamentals of mechanical refrigeration
Perform proper service and repair procedures
Apply electrical fundamentals
Interpret electrical diagrams
Apply electrical test equipment
Install electrical devices
Design refrigeration system
Install refrigeration project
Prepare for employment
Describe basic HVAC systems
Describe air distribution arrangements for HVAC systems
Describe air properties and measurement for HVAC systems
Explain heat recovery/thermal storage systems
Maintain heat pump systems
Apply water treatment for cooling towers and evaporate condensers
Maintain HVAC control loops
Describe ammonia systems
Calculate HVAC heating and cooling loads
Design commercial HVAC air distribution system
Select commercial HVAC equipment
Prepare engineering report
Service gas heating systems
Maintain computer environmental systems (Liebert)
Apply energy management procedures for HVAC & R systems



Cooperative Programs

This is a Cooperative Education program that 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 Co-op 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 independently) to find meaningful work experience.
For more information see page 11. The complete cooperative education policy including student, institute and employer responsibilities is available through the Cooperative Education office and the Registrar's office.

Co-op Coordinator: (604) 432-8291
General Inquiries: (604) 432-8634
The Cooperative Education office is located in Building NE1.

Program Length

80 weeks, full-time consisting of 1, 20-week term and 2, 10-week academic terms, combined with two co-op work terms: each co-op work term is 20 weeks.

Normal Course Hours

0800-1430, Monday through Friday

Prerequisites

Grade 12 graduation with C or better in Math 11 or successful completion of a pretest. Applicants must also attend a personal interview with the department to determine their suitability for the program. An interview is granted only after academic requirements have been met.

Instructors

Mario LaFlamme
Ron Verch

INDUSTRIAL MAINTENANCE MECHANIC
Cooperative Diploma Program

Industrial Maintenance Mechanics are responsible for the maintenance and repair of a wide variety of industrial equipment. Duties include: installation, maintenance and repair of mechanical, hydraulic, pneumatic and hybrid systems. These systems include power drives, material handling, production, power generating and distribution equipment.

Associated skills and knowledge in related areas such as welding, fabrication, electrical troubleshooting and machining are sometimes required. Knowledge of preventive maintenance methods and the use of computers may be required. Good interpersonal and communication skills are important in the performance of duties in a wide variety of industrial environments.

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
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, hoist and rig loads
Select lubricants, hydraulic and cutting fluids
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 and alignment
Describe material handling equipment
Describe, test and troubleshoot hydraulic components and systems
Use computers in an industrial application (robotics, vibration analysis, computer numerical control, computer alignment)
Describe preventive maintenance procedures
Prepare for employment

Cooperative Programs
This is a Cooperative Education program that 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 Co-op 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 independently) to find a meaningful work experience. For more information see page 11. The complete Cooperative Education policy including student, institute and employer responsibilities is available through the Cooperative Education Office and the Registrar's Office.

Co-op Coordinator: (604) 432-8291
General Enquiries: (604) 432-8634
The Cooperative Education Office is located in Building NE1.

Program Length
80 weeks, full-time consisting of three 16-week academic terms combined with 2 co-op work terms: each co-op work term is 16 weeks.

Normal Course Hours
0730-1400, Monday through Friday (possibly 1230-1900 in welding and machine shop).

Prerequisites
High school graduation or successful completion of BCIT pretest 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.

BCIT currently has agreements with a number of school districts throughout the province that 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 academic prerequisites (no pre-entry test) and complete a related Career Preparation program with good grades. For additional information see your high school counsellor, Technical Education teacher, or call BCIT Student Services at (604) 434-3304, or 1-800-667-0676 for enquiries from outside the Greater Vancouver area.

Instructor
Owen Collings, I.D., Machinist T.Q., Millwright 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 semiautomatic 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.

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TRADES TRAINING

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
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

Normal Program Length
34 weeks, full-time.

Course Hours
0700-1400 (first shift) or 1230-1915 (second shift), Monday through Friday.

Prerequisite
High School graduation or successful completion of the BCIT pretest.

BCIT currently has agreements with a number of school districts throughout the province that 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 academic prerequisites (no pre-entry test) and complete a related Career Preparation program with good grades. For additional information see your high school counsellor, Technical Education teacher, or call BCIT Student Services at (604) 434-3304, or 1-800-667-0676 for enquiries from outside the Greater Vancouver area.

Instructors
Greg Burke, I.P., B.Ed.
Ted Marchant, I.D., T.Q., I.P.
Fred Shim, Machinist I.P., Mech. Tech.
John Spencer, I.D., City & Guilds Machinist T.Q., Chief Instructor
Pat Thomas, I.D., Machinist I.P., Electronics Tech. T.Q.
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 petrochemical plants, with smaller groups being employed in the manufacturing field and the food processing industry. 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 and mental 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 precision measuring, layout and hand tools
Use fastenings and fittings
Use support machines
Use lathe, milling machine, and drill press
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.

Prerequisite
High School graduation or successful completion of the BCIT pretest.

BCIT currently has agreements with a number of school districts throughout the province that 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 academic prerequisites (no pre-entry test) and complete a related Career Preparation program with good grades. For additional information see your high school counsellor, Technical Education teacher, or call BCIT Student Services at (604) 434-3304, or 1-800-667-0676 for enquiries from outside the Greater Vancouver area.

Instructor
Steve Ramage

TRADES TRAINING

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 currently 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 colour 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 at (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.

Prerequisite
High School graduation or successful completion pre-entry test.

POWER ENGINEERING: TECHNICAL PROGRAM
Certificate Program

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 that provide graduates with the necessary technical background in applied mathematics and science to be eligible to enter the Power and Process Engineering program. Technical Program students wishing to continue into the Power and Process program the following year must inform the Admissions department in writing by February 15 in order to have a seat reserved for them.**

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 currently 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 colour 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 at (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.

Prerequisites
High School graduation including Math 12 and Physics 11 or successful completion of BCIT pretest.

POWER AND PROCESS ENGINEERING
Diploma of Trades Training

Note: BCIT Power Engineering Technical students wishing to continue their studies in the Power and Process Engineering program the following year, must inform the Admissions department in writing by February 15 in order to have a seat reserved for them.

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 currently 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 colour 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 at (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.

Prerequisites
a. A valid 4th Class Power Engineering certificate and
b. Recent (within 2 years), successful completion of either the BCIT Power Engineering Technical program or the first year of a university engineering program, or
c. Applicants who do not possess the above prerequisites but believe they have sufficient background to be successful in the program may request an individual assessment by the Power Engineering department.

Instructors
J. Brown
R. Carviel
H. Doad, Coordinator, Full-time Programs
P. George, Coordinator, Upgrading and Correspondence
F. Hajer
A. Lees
H. Rink
D. Rogers
G. White, Chief Instructor

REFRIGERATION MECHANIC
Certificate Program

A refrigeration mechanics job is very rewarding and encompasses a wide variety of duties, such as: repair/installation of commercial equipment found in the food industry; repair/installation of residential equipment such as central air conditioning; other tasks such as operation and/or repair of ammonia plants, fish boats and small corner store equipment. Refrigeration mechanics also deal with customers daily therefore customer relations is a very important aspect of your daily routine.

The Program
Training prepares students for entry-level employment in the commercial refrigeration industry. Upon successful completion of this program, students should seek an entry-level position as an apprentice in this field or in other related industries.

Job Opportunities
Employment opportunities exist throughout the province in areas such as residential equipment repair/installation; commercial industrial equipment repair/installation; refrigeration wholesale parts/counter person; and domestic appliance repair.

Program Content
Trade safety
Processes technical information
Trade tools and fasteners
Oxyacetylene welding
Fundamentals of refrigeration
Service and repair procedures
Electrical fundamentals
Electrical diagrams
Electrical test equipment
Install electrical/mechanical devices

Program Length
25 weeks, full-time.

Normal Course Hours
0800 to 1430, Monday through Friday

Prerequisites
Grade 12 graduation with C or better in Math 11 or successful completion of the BCIT pretest.

Instructors
Mario LaFlamme
Ron Verch

TRADES TRAINING

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 that 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 Co-op 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 independently) to find a meaningful work experience. For more information see page 11. The complete Cooperative Education policy including student, institute and employer responsibilities is available through the Cooperative Education Office and the Registrar's Office.

Co-op Coordinator: (604) 432-8291
General Inquiries: (604) 432-8634
The Cooperative Education office is located in Building NE1.

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

Normal Course Hours

0700-1400, Monday through Friday.

Prerequisites

a. High School graduation with Grade 12 Math and a successful interview by the department;
or
b. Pass a pre-entry test measuring math and reading skills and a successful interview by the department.

BCIT currently has agreements with a number of school districts throughout the province that 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 academic prerequisites (no pre-entry test), complete a related Career Preparation program, have good grades in Grade 12, and/or relevant work experience. For additional information see your high school counsellor, Technical Education teacher, or call BCIT Student Services at (604) 434-3304, or 1-800-667-0676 for enquiries from outside the Greater Vancouver area.

Instructor

Tony Hurley, I.D., Machinist T.Q., Instrument Maker

PACIFIC MARINE TRAINING CAMPUS

Please note: All course numbers are currently undergoing a renumbering. The course numbers listed for PMTC are the old numbers. These courses are expected to be renumbered (changed) for January 1996. All programs are under curriculum review, please contact PMTC at (604) 985-0622 or Student Services at (604) 434-3304 to verify program content.

British Columbia's extensive coastline and offshore islands, scattered concentrations of people, and resource industries have all contributed to the development of a large marine industry served by ferries, tow boats, barges, fishing vessels, and a variety of merchant vessels. The necessity for educational facilities to provide and improve the knowledge and skills of individuals embarking on a career at sea has long been recognized.

The Vancouver School Board first began providing navigation training in 1919, in a building on Dunsmuir Street. This short-lived venture soon lapsed, and it was not until 1938, when the provincial government opened the Vancouver Navigation School, that publicly funded marine instruction was again available on the West Coast of Canada. In 1949 this operation was transferred to the Vancouver Vocational Institute where, (with the addition of a marine engineering component), it remained until 1975. During that year, new leased premises were acquired, and this new facility, namely the Marine Training Centre, began providing training in navigation and engineering. Following the establishment of the Marine Training Advisory Council in 1976, it was decided that the responsibilities of the Centre should be increased. As a result, in 1978, it was designated a Provincial Institute and renamed the Pacific Marine Training Institute. In December 1994 PMTI merged with the British Columbia Institute of Technology to become the Pacific Marine Training Campus of BCIT.

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The Pacific Marine Training Campus is located on the North Shore of Vancouver Harbour, situated close to the Lonsdale Quay, and enjoys easy access to public transportation, shopping facilities, recreational centres, restaurants and all the other necessities of student life. The location also provides an unobstructed view of the harbour, and well-established, vital links with the many varied and diverse elements of the shipping industry. This architecturally modern facility (designed specifically to house the Marine Institute) comfortably accommodates classrooms, various laboratories, machine shops, a student lounge and cafeteria, library, administration offices, an indoor training tank and a 35 metre pier extending into Vancouver's harbour.

PMTC cooperates with the Justice Institute of B.C. to offer some training in fire fighting at the Fire and Safety Training Centre (FSTC) in Maple Ridge. This training site is located 58 kilometres east of the North Vancouver campus in a nonresidential area which can accommodate the special requirements of Fire Fighting and Hazardous Material training. Facilities at the JIBC - FSTC include a ship mock-up, railway tank cars, a variety of fire fighting training pads, a smoke house, pumper truck, road trailers, oil and chemical spill simulation, classrooms, and support facilities.

PMTC offers a wide variety of courses and programs in navigation, marine engineering, seamanship, and shipping. Regular courses are offered between September and June, and some special courses are offered in the summer. PMTC will — given sufficient notice — also develop and conduct specialized contract courses tailored to meet the needs of any company or government agency. For further information please contact the Associate Dean.

Job Opportunities

The diverse and growing Canadian marine industry offers many challenging and rewarding career opportunities. Qualified men and women can expect to find employment in one of the following sectors of the marine industry:

The merchant fleet consists of several hundred vessels. A fleet of bulk carriers operates on the Great Lakes, and some of them occasionally operate in coastal trade and beyond. Tankers, general cargo ships, passenger vessels and ferries constitute the remainder of the commercial shipping fleet. There is also an extensive tug and barge operation, especially on the B.C. Coast.

Offshore fishing is an important part of the marine industry in Canada, and fishing fleets require competent personnel with comprehensive knowledge of navigation, radar operation, stability and safety.

Oil and gas exploration on the East Coast is expanding as Canada strives to reach its goal of energy self-sufficiency. Offshore drill ships and platforms, supply vessels, survey ships and pipe-laying equipment are involved in these operations.

The federal fleet includes Canadian Coast Guard vessels, Fisheries and Oceans vessels, and Defence Auxiliaries and Public Works vessels. These vessels are responsible for providing search and rescue services, maintaining aids to navigation (buoys, lights, etc.), supporting ships in ice-congested waters, laying and repairing cables, controlling pollution and cleaning up spills.

Land-based career opportunities also exist in the marine shipping business community including, for example, shipping agencies, stevedores, freight forwarders, and ship and cargo brokers.

CERTIFICATION AND DIPLOMAS

Nautical and Engineering Certificates

The Canadian Coast Guard (CCG) issues certificates of competency to commercial Shipmasters, Mates, and Marine Engineers to indicate that they are qualified to act in a specified capacity on a ship. The primary function of the Institute is to prepare students for the examinations leading to the issuance of these certificates. The examinations are conducted by examiners appointed by the Ministry of Transport. It is the responsibility of the student to arrange examinations with the Regional Ship Safety Branch of CCG. Students are advised to do this early, since examination facilities are limited.

The examiners require proof of previous service in ships at sea before accepting a candidate for examination. As soon as sea service starts, an accurate record should be maintained. Where articles of agreement are required, the record would normally be found in the entries in the Seaman's Discharge Book. On ships where the crew is not signed on articles, testimonials of service should be obtained. These should give the name and tonnage of the ship, the dates during which the service occurred, the capacity in which the person served, and the geographical area in which the ship operated. Each testimonial must be signed by the Master or a responsible person employed by the company owning or operating the ship.

Information regarding sea service requirements may be obtained by contacting either the Nautical Examiner, or the Marine Engineer Examiner, at one of the following Canadian Coast Guard Ship Safety Branches:

District Surveyor
Canadian Coast Guard Ship Safety
101-260 West Esplanade
North Vancouver, B.C. V7M 1A4
Telephone: (604) 666-0834

District Surveyor
Canadian Coast Guard Ship Safety
25 Huron Street
Victoria, B.C. V8V 4V9
Telephone: (604) 363-3646

District Surveyor
Canadian Coast Guard Ship Safety
Room 101-A, 60 Front Street
Nanaimo, B.C. V9R 5H7
Telephone: (604) 754-0244

District Surveyor
Canadian Coast Guard Ship Safety
Seal Cove Coast Guard Base
P.O. Box 3670
Prince Rupert, B.C. V8J 3R1
Telephone: (604) 627-0340

Students with no previous sea-service, who are considering a career in the marine industry, should contact the Marine Certification Advisor. PMTC offers the following programs for students who have no sea experience: New Entry Seaperson (Efficient Deckhand); Marine Engineering Apprentice; Marine Emergency Duties; and Shipping and Marine Operations.

Any students intending to pursue a career at sea should undergo a medical examination and a colour perception test. Candidates should obtain a copy of the general application form from a Coast Guard Ship Safety Office, and make the necessary arrangements with a general practitioner or eye specialist for an examination.

Shipping and Marine Operations Certificate/Diploma (Program Under Review)

A Certificate or Diploma in Shipping and Marine Operations is issued by BCIT upon successful completion of the program. No previous sea service is required to enrol in either of these programs, and there are no CCG Examinations. For further details see the appropriate section following.

Admission Restrictions

BCIT will accept applications for admission from prospective students only if they meet the following requirements:

a) they are citizens of Canada, or
b) hold status granted by the Canada Employment and Immigration Commission as permanent residents (landed immigrants), proof of which must be submitted, or
c) hold a valid Student Authorization issued by Canada Immigration, proof of which must be submitted. Visa Students will be admitted to a program or course only if space is available and a Canadian student is not displaced.

PMTC will only enrol a person in a course leading to Canadian Coast Guard examinations if the person qualifies for entrance to the examination. The Canadian Coast Guard requires proof of previous service in ships at sea, and proof of nationality (the candidate must be a Canadian citizen, British subject, or a Permanent Resident of Canada) before accepting a candidate for examinations.

International students are advised to contact the Registration Office for more information about foreign student application requirements.

To register in a course, an applicant must have also completed any required prerequisites.

MARINE ENGINEERING PROGRAMS

The Pacific Marine Training Campus offers a variety of programs that prepare the participants for CCG examinations. Each program contains a number of courses which comprise the material on which the candidate will be examined by the CCG. CCG Certificates of Competency for Marine Engineers are issued in four grades:

- Fourth Class Marine Engineer
- Third Class Marine Engineer
- Second Class Marine Engineer
- First Class Marine Engineer

In addition, each grade of certification is subdivided into three types:

- Steam Certificate: for use on a ship propelled by steam engines
- Motor Certificate: for use on a ship propelled by diesel engines or gas turbines
- Combined Certificate: for use on a ship propelled by steam engines, diesel engines or gas turbines.

Throughout the following program and course descriptions prerequisites and sea service requirements for the final CCG oral examination are provided. These are for general information purposes only, and are not intended to replace the specific CCG regulations governing prerequisites and sea service requirements, as set out in the Regulations Respecting the Examination of Marine Engineers. It is the responsibility of the student to obtain specific information regarding these regulations from the District Surveyor at the nearest CCG Engineering Examination Centre. All decisions regarding eligibility and assessment of sea service are made by the CCG Examiner. Students planning to do the final oral examinations for CCG Certificates of Competency must also hold the appropriate level of Marine Emergency Duties (MED) training and Standard First Aid Certification as required by CCG regulations. MED courses are not included with any of the Marine Engineering programs, and it is the responsibility of the student to determine the necessary MED training requirement, and provide proof of completion to the CCG Examination Centre. As of September 1, 1994, all candidates for Marine Engineering Certificates of Competency are also required to complete Marine Engine Room Simulator Training prior to obtaining their certificate. Marine Engineer Officers currently holding Certificates of Competency may obtain a Continued Proficiency Certificate only after providing proof of Simulator Training, or by successfully challenging the CCG assessment exercise. Please refer to the section titled Marine Engine Room Simulator Training for more information.

Some of the Marine Engineering courses have been accredited with CCG, which means that successful completion of course material will exempt students from the CCG examination. Students must elect the accreditation option on the first day of class, so it is recommended that those students interested in the accreditation option speak with the Chief Instructor, Marine Engineering, prior to registration.

Note: Marine Engineering Department Recommendation - Although the programs may be completed in a modular format, it is strongly recommended that the Engineering Knowledge courses be done only after all other subjects in that level have been completed.

Instructors

M. Davison
G. Gray
E. Hayden
B. Noronha
B. Shepherd, Chief Instructor, Marine Engineering

MARINE ENGINEER FOURTH CLASS

This program prepares participants for all CCG examinations leading to the Fourth Class Marine Engineer Certificate of Competency, which qualifies the holder to act as a watchkeeping engineer in a ship of any power on any voyage. The examination for this grade of certificate is held in three parts in the case of a Steam or Motor Certificate, and in four parts in the case of a Combined Certificate.

Program Length

6 weeks.

Prerequisites

None.

Sea Service Requirement

36 months "qualifying time," which must include 6 months seatime.

Note: Applicants for the CCG final oral examination leading to the Fourth Class Marine Engineer Certificate of Competency must also complete:

- Marine Engine Room Simulator level I
- Marine Emergency Duties(MED) A-1, B-1, B-2, C
- Standard First Aid

These are not included in the Fourth Class program and must be enrolled separately.

Program Content

Engineering Knowledge

General Marine Engineering Principles and Practice — Presents a general survey of marine auxiliary machinery, ship systems, emergency action , engine room operating procedures and safe working practices. The subject material includes: the safe use of hand tools normally found in an engine room; the various materials used in marine machinery and systems; water, fuel, hydraulic and pneumatic systems and their associated pumps and storage arrangements; electrical generators and associated distribution systems; steering gear arrangements; fire and pollution prevention measures; life-saving equipment.

Marine Internal Combustion Machinery — Introduces the construction, operation and overhaul of the various types of internal combustion engines found in a ship. The subject material includes: the construction and principals of operation of the compression ignition engine; starting and reversing arrangements; supercharging; single and multiple engine installations; transmission of power by gearing and electrical methods; engine lubrication systems and oil purification methods; speed, temperature, pressure and flow control methods; overhaul, running maintenance and preventive maintenance.

Marine Steam Machinery — Introduces construction, operation and maintenance of the various types of steam generators, reciprocating machinery, turbine machinery and the auxiliary systems and pumps necessary for the operation of a steam power installation. The subject material includes: material and construction arrangements of the steam generator; piping and furnace arrangements for maximum utilization of fuel energy; temperature, pressure, and flow controllers; safety precautions to be observed in the operation, repair and inspection of steam generators; fuel, air and feed water systems and their associated pumps; fuel and feed water quality control and storage arrangements; construction, operation and maintenance of reciprocating machinery; construction, operation and maintenance of turbine machinery; starting and reversing methods; single and multiple engine installations; transmission of power by gearing and electrical methods; engine lubrication and oil purification; speed control; overhaul, running maintenance and preventative maintenance.

MARINE ENGINEER THIRD CLASS

This program prepares participants for all CCG examinations leading to the Third Class Marine Engineer Certificate, which qualifies the holder to act as a watchkeeping engineer in any ship of any power on any voyage. In addition, the holder may act as a Chief Engineer on ships sailing with limited power on certain voyages.

Third Class Math & Applied Mechanics, Thermodynamics and Electrotechnology subjects are now offered as accredited courses. A student electing the accredited course study option will now follow a schedule which, on successful completion, will provide exemption from CCG examinations. Successful completion is contingent upon maintaining a passing grade in course work, lab work, interim tests, and the final examination. At the beginning of the course, students must elect their choice of the accredited course of study, or preparation for CCG examinations.

Program Length

33 weeks.

Prerequisite

Fourth Class Marine Engineer Certificate of Competency (required for both accredited and CCG examination study programs).

Sea Service Requirement

12 months sea service is required before writing the Engineering Knowledge examinations at the CCG Examination Centre.

Note: Applicants for the CCG final oral examination for the Third Class Marine Engineer Certificate of Competency must have completed:

- Marine Engine Room Simulator level I (level II is also required for a "Chief Engineer Endorsement")
- Marine Emergency Duties (MED) C, and D,
- valid Standard First Aid Certificate.

These are not included in the Third Class program, and must be enrolled separately if required.

Program Content

Mathematics and Applied Mechanics — Reviews basic arithmetic, algebra, geometry, trigonometry and formulae handling skills. The course also includes an introduction to the science of strength of materials, the theory of machines and elementary hydrostatics. Participants gain a firm grasp of material that will be dealt with in more depth at the Second and First Class Engineer levels.

Thermodynamics — Introduces the laws of thermodynamics, heat transfer, the gas laws, elementary combustion theory and properties of working fluids within simple ideal closed cycles. Students carry out plant efficiency calculations, as well as heat and work transfer calculations, on laboratory machines.

Electrotechnology — Presents an introductory course in electrotechnology for the Marine Engineer. Topics to be covered will include: Ohm's Law, DC circuit calculations, power calculations, circuit analysis magnetism and batteries; introduction to AC circuits, resistance, reactance, impedance, and power factor; elementary treatment of DC and AC machines; single phase transformers; parallel operation of AC generators, voltage regulators, and load sharing; electrical test instruments; diodes and rectifiers.

This course is designed to be practical, with an emphasis on the safe and efficient operation of marine electrical systems. Approximately 50% of the course is spent in the laboratory.

Engineering Knowledge

General Marine Engineering Principles and Practice
Expanding on knowledge gained in the Fourth Class Marine Engineer Course, students study methods of preventing fire and explosion; maintenance of fire extinguishing and prevention equipment; and the maintenance and overhaul of rudders, propellers and propeller shafting.

Marine Internal Combustion Machinery
Students further develop the knowledge gained from the Fourth Class Marine Engineer Course by studying details of engine-operated valve mechanisms; adjustment and balancing of cylinder power outputs; special arrangements made in marine gearing for main power transmission; alignment of engines and shafting and minor repairs to pressure vessels.

Marine Steam Machinery
Building on knowledge from the Fourth Class Marine Engineer Course, students study special securing arrangements for steam machinery; alignment of engines and shafting; minor repairs to pressure vessels; the dangers of feed water impurities and their elimination.

MARINE ENGINEER SECOND CLASS

This program prepares participants for all CCG examinations leading to the Second Class Marine Engineer Certificate of Competency, which qualifies the holder to act as a second engineer in a ship of any power on any voyage, or as a Chief Engineer in a ship of moderate power on any voyage.

Note: Every student registered for Applied Mechanics, Thermodynamics, Electrotechnology or Naval Architecture must take a mathematics evaluation test before commencing study in these courses. A student who fails the test must take a mathematics upgrading course concurrently with instruction in the modules. A student who fails the test with a very low percentage must take a mathematics upgrading course before commencing instruction in these modules.

Program Length
33 weeks.

Prerequisite
Third Class Marine Engineer Certificate of Competency.

Sea Service Requirement
12 months.

Note: Applicants for the CCG final oral examination for the Second Class Marine Engineer Certificate of Competency must have completed:
- Marine Engine Room Simulator level II
- Marine Emergency Duties (MED) C, and D
- A valid Standard First Aid Certificate.

These are not included in the Second Class program, and must be enrolled separately if required.

Program Content
Drafting — Introduces the principles of projection, including practical work to develop adequate skills to produce working drawings from which replacement parts of machines could be manufactured. (Note: Students are required to provide their own set of drafting instruments.)

Applied Mechanics — Students will study the resolution of forces; moments and couples; frictional forces; the relationship of time, distance, velocity and acceleration; the relationship of force, work and power; forces in rotary motion; the principles and efficiencies of simple machines; the centroid of irregular areas; mechanical stress and strain; stress and strain in bending, shear and torsion; safety factors and the design of riveted joints; fluid flow and pressure.

Thermodynamics — Introduces thermodynamics to the extent that will permit a thorough understanding of the relationship between heat and power as it applies to marine machinery. The subject material includes: thermometry, measurement of heat energy and conversion to other forms of energy; resultant temperature mixtures; the properties of steam and the use of steam tables; the gas laws; theoretical efficiencies of compressors and heat engines; compounding of reciprocating and turbine machinery; steam generation and related efficiencies; refrigeration machines and related efficiencies; combustion of fuel and related efficiencies.

Electrotechnology — Students will study electrical circuits and machines involving calculations of power outputs and efficiencies, and the construction of generators, motors and switchgear. The subject material includes: the mechanical, thermal, magnetic and chemical effects of an electrical current; DC circuits and AC circuit theory; electrical measuring instruments; primary cells; generation of electrical power; switchboards and power distribution involving more than one generator; electric motor starting switchgear.

Naval Architecture — Presents a treatment of hydrostatics relating to flotation and ship stability, propulsion characteristics of ships and a description of the various forms of hull construction. The subject material includes: significance of hull coefficients; change of trim, list, and draft due to addition, subtraction, and shift of weight or change of water density; basic ship stability; resistance to propulsion as related to speed and fuel consumption; propeller efficiency; the constructional details of a steel ship.

Engineering Knowledge
The following two courses (General Marine Engineering Principles and Practice, and Marine Internal Combustion Machinery) are offered concurrently to reduce the duplication of material, and to permit the introduction of new subject material without lengthening overall course time.

General Marine Engineering Principles and Practice — Presents a detailed study of the construction of marine machinery, instrumentation and calibration of measuring instruments, procedures for emergencies and the making of temporary and permanent repairs to ship machinery. The subject material includes: the standards for materials used in marine machinery and the tests to which they are subjected; the principles and constructional details of all measuring instruments found in a ship; the effect and prevention of corrosions; the calculation of power output from an installed engine using a torsion meter and the calculation of engine efficiencies using a cylinder pressure indicator; the construction and operation of the various types of steering machinery and control systems; the preventions of gas accumulation in enclosed spaces; fire detection systems and the use of portable and fixed extinguishing equipment.

The latter part of this course will concentrate on management techniques, organizational methods, and regulatory and legal knowledge which are a necessary part of any Senior Engineer's job. Material will include lectures on classification societies, the Ministry of Transport, and the Canada Shipping Act. Students also enhance their administrative, writing, and oral communication skills.

Marine Internal Combustion Machinery — Presents an investigation of the design and construction of the common types of marine internal combustion engines, their associated support systems, common defects and remedy. The subject material includes: the processes used in the manufacture of marine machinery and the methods used to secure machines in a ship; starting and reversing arrangements, including compressed air starting systems; engine fuel, lubrication and cooling systems; constructional details and the safe management of auxiliary steam generators; common defects encountered in marine internal combustion engine installations and their remedies; the efficient and safe management of marine machinery at sea and in port; planned maintenance.

Marine Steam Machinery — Due to low demand, PMTC does not currently offer this course. Any student interested in this subject should contact the Chief Instructor, Marine Engineering.

MARINE ENGINEER FIRST CLASS

This program prepares participants for all CCG examinations for the First Class Marine Engineer Certificate of Competency, which qualifies the holder to act as a Chief Engineer in any ship of any power on any voyage.

Note: Every student registered for the modules of Applied Mechanics, Thermodynamics, Electrotechnology, or Stability and Ship Construction must take a mathematics evaluation test before commencing study in this program. A student who fails the test must take a mathematics upgrading course concurrently with instruction in the program. A student who fails the test with a very low percentage must take a mathematics upgrading course before commencing instruction in the program.

Program Length
33 weeks.

Prerequisites
Second Class Marine Engineer Certificate of Competency.

Sea Service Requirement
18 months.

Additional Requirements: Applicants for the CCG final oral examination for the First Class Marine Engineer Certificate of Competency must have completed:
- Marine Engine Room Simulator level II
- Marine Emergency Duties (MED) C, and D
- A valid Standard First Aid Certificate.

These are not included in the First Class Marine Engineer program, and must be enrolled separately if required.

Program Content
Applied Mechanics — Covers losses in machines due to frictional forces; angular momentum and relative motion in two planes; translation of energy units; flywheels and the conservation of momentum; harmonic motion; dynamic balancing in one plane; velocity ratios and efficiencies of machines; moduli of elasticity and rigidity; mechanical stress and strain; strength of joints; torsional, compressive and tensile loading of compound materials; eccentric loading of columns; stress in thin shells; floatation in stratified fluids; pressure on immersed surfaces; venturi effect and centrifugal pump blade diagrams.

Thermodynamics — Covers thermodynamics in-depth to give a sufficient understanding of the design of machines used to convert heat into mechanical energy. The subject material includes: the expansion, entropy, enthalpy and properties of steam; calorimetry; the relationship of pressure, volume and temperature in isothermal and adiabatic expansions; the internal combustion engine cycles and efficiencies; superheating and back pressure applications; turbine blade flow diagrams; heat flow in turbines; exhaust gas analysis; refrigeration.

Electrotechnology — Presents a survey of the technology of marine electrical installations, including the theoretical background necessary for competent management of the equipment. Topics include magnetic circuits; two and three wire direct current distribution systems; electric motor starting switchgear; delayed action switchgear; design of electric motors and generators for particular applications; alternating current; root-mean-square values and power factors; resistive-inductive-capacitive circuits; power factor control; star and delta alternating current systems; characteristics of alternators and inductive motors; generator-motor-main propulsion arrangements; transformers; measuring instruments and maintenance.

Naval Architecture — Further develops the materials presented in Stability and Ship Construction in the Second Class Marine Engineer Course, with emphasis on hull subdivision. Specific Topics include hull form coefficients; second moment of areas and volumes; centres of pressure; cross curves of stability; management of fluids in a ship for maintenance of stability at sea; rudder forces and heel; model characteristics and propulsion resistance; propeller performance; ventilation systems; subdivision of hull for fire and flooding; dry-docking arrangements.

Engineering Knowledge

The following two courses (General Marine Engineering Principles and Practice, and Marine Internal Combustion Machinery) are offered concurrently to reduce the duplication of material, and permit the introduction of new subject material without lengthening overall course time.

General Marine Engineering Principles and Practice — Emphasizes the efficient maintenance of machinery and the detection of possible breakdowns. The subject material includes: the heat treatment of the material of construction used in a ship; the construction and care of control instrumentation; the properties of explosive mixtures; the maintenance of machinery efficiency; organization of the engine room personnel for emergencies; use and maintenance of emergency equipment; preparation of machinery for survey and repair; preparation of periodical and damage reports for record.

Marine Internal Combustion Machinery — Emphasizes the detection and correction of defective equipment, and the good management of the machinery installation in a ship. The topics include a survey of machinery defects and possible corrective action; emergency repairs at sea; action to be taken in sudden emergencies; the recognition of dangerous working practices; oil pollution prevention.

The course emphasis will be to provide the student with a greater depth of knowledge in these subjects, with a particular focus on operational philosophies of control and instrumentation systems, and management and administrative processes.

MARINE ENGINE ROOM SIMULATOR TRAINING

Effective September 1, 1994, all candidates for Marine Engineer Certificates of Competency must complete Simulator Training and successfully pass the CCG assessment exercise. The training will be two weeks in duration at each level.

Marine Engineer Officers currently holding Certificates of Competency who require a Continued Proficiency Certificate (CPC) may take a challenge assessment exercise on the Simulator in lieu of the training program.

At least 12 hours of familiarization on the Simulator will be required before a candidate may attempt the challenge examination. A 24 hour "Continued Proficiency Certificate" course (which includes this assessment exercise) is available for those who require it. For individuals who are upgrading from Second Class to First Class Engineer, and do not currently hold a level I certificate, a 24 hour "Familiarization" course is required prior to the level II course.

MARINE ENGINE ROOM SIMULATOR LEVEL I

Watchkeeper and Control Room Operator — Required for those candidates applying for Fourth Class, Third Class, and Chief Engineer of Motor Driven Fishing Vessel (CEMDFV) Certificates of Competency. The course provides instruction and basic training is propulsion plant operation and watchstanding. Emphasis will be on watchstanding procedures associated with main engine, and subsystems, for both slow and medium speed engines.

Course Length

80 hours.

Prerequisite

6 months seatime.

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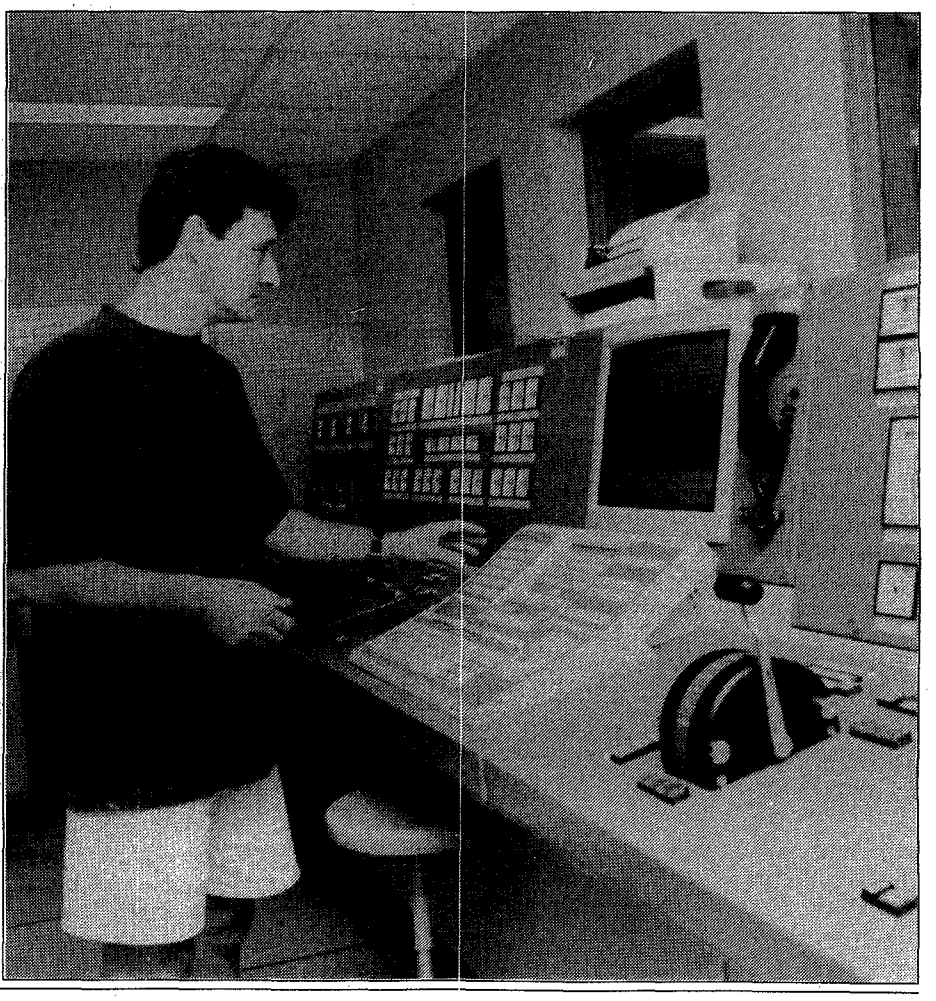

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MARINE ENGINE ROOM SIMULATOR LEVEL II

Plant Managers — Required for those individuals applying for Marine Engineer Second Class, and First Class Certificates of Competency, and for Third Class Marine Engineers who apply for a "Chief Engineer Endorsement" (see Ship Safety Notice 7/95, and "Rules for Third Class Candidates from CCG Ship Safety Offices".) The Level II course is designed for advanced plant operations and diagnostic training, to provide advanced coverage of condition monitoring and trending. The course will also demonstrate the effects of degrading equipment conditions, variations in ambients, fuel characteristics, and ship sailing conditions on propulsion plant performance and fuel consumption. The course will also focus on gathering data from plant printouts, and observation of operating conditions during a simulator exercise. Student evaluation will be based on performance in the simulator, and completion of written work in conjunction with the simulations, and successful completion of assessment exercises.

Course Length
80 hours.

Prerequisite
Marine Engine Room Simulator level I, or 24 hour "Familiarization" course.

MARINE ENGINE ROOM SIMULATOR "FAMILIARIZATION"

A comprehensive course to introduce students to the diesel simulator, its systems, and operation. The course is structured to provide familiarization with diesel engine setup, operation, and system studies. The course is similar to the Continued Proficiency Certificate (CPC) course but does not include the assessment exercise.

Course Length
24 hours.

Prerequisite
6 months seatime.

MARINE ENGINE ROOM SIMULATOR "CONTINUED PROFICIENCY CERTIFICATE"

Designed for candidates in need of a Continued Proficiency Certificate, or those individuals needing to renew their existing CPC. The course includes familiarization on the computer workstations and the systems that are modelled in the operational simulator. The course also includes a series of evaluated exercises in the operational simulator and on the workstations which comprise the challenge assessment exercise identified in Ship Safety Bulletin 07/95.

Course Length
24 hours.

Prerequisite
6 months seatime.

MARINE ENGINEER PROFESSIONAL DEVELOPMENT AND OTHER COURSES

Math Correspondence

Available to all Marine Engineering students, and strongly recommended for those students who intend to register in the Second and First Class Marine Engineer programs. The correspondence program used is the Open Learning course "Math 024", and PMTC Marine Engineer Instructors provide tutorial assistance. This course of study provides students with a sufficient background in mathematics to prepare for the theoretical subjects in the engineer courses. A good grasp of mathematics is necessary for any engineer embarking on the senior certification courses.

Course Length
24 weeks (suggested).

Prerequisites
None.

Course Description
Topics include algebra, logarithms, trigonometry and geometry.

Marine Engineer Programmable Logic Controllers (PLC)

Introduces programming and maintenance of programmable controllers. The course is designed for engineering personnel who require knowledge of how machinery is controlled by PLCs on ships. The topics covered will include motor starting, compressor control, sequential motor starting using timers, tank level and temperature monitoring. This is a practical course, with an emphasis on marine applications. Students will develop and test programs using Siemens PLCs. Enrolment will be limited to four students.

Course Length
5 days (30 hours).

Prerequisites
None.

Marine Engineer Electrical Generator Systems

Intended for the Marine Engineer who wishes to gain a comprehensive understanding of the dynamic behaviour of ship generators under load. Using a computer-controlled diesel generator which simulates the control of two diesel generators, students can parallel and load share, change governor settings, start and stop large induction motor loads and see the system response. The entire exercise is displayed in real time on the computer. To gain maximum benefit from this course, students should be familiar with paralleling generators and have a knowledge of three phase AC theory. Enrolment will be limited to four students.

Course Length
2 days (12 hours).

Prerequisites
None.

Marine Engineer Pneumatic Controls Familiarization

Intended for the operating Marine Engineer. The student is introduced to logic symbols and systems, schematic symbol conventions and the reading of schematic diagrams. This is primarily a hands-on course, and students will build, test and troubleshoot systems using equipment commonly found on local ships. The course will include speed, clutch and pitch control systems. Safety concerns will be reinforced at all times, with emphasis placed on the student recognizing the dangers inherent in the maladjustment of control systems. Enrolment will be limited to six students.

Course Length

5 days (30 hours).

Prerequisites

A Fourth Class Marine Engineer Certificate of Competency (or higher) is preferred.

Marine Engineer Hydraulics

Intended to provide the engineer with an understanding of shipboard hydraulic installations. The course covers basic schematic drawing interpretation; open and closed loops; system and component inspection; elements of piping; system structure; preventative maintenance, and basic troubleshooting. This is a practical course, and students are required to supply their own coveralls and safety footwear. Enrolment will be limited to six students.

Course Length

5 days (30 hours).

Prerequisites

A Fourth Class Marine Engineer Certificate of Competency (or higher) is preferred.

Marine Engineer Machine Tools and Hand Skills Training

Presents a hands-on introductory course in the machining of metals using a variety of hand and machine tools, including lathes, a milling machine, a radial arm drill press, and a shaper. Thirty hours of electric arc and gas welding, and brazing are included in the course. This Skills Training course is part of the 600 hour MOT requirement for the Fourth Class Marine Engineer certification.

Course Length

20 days (120 hours).

Prerequisites

None.

Marine Engineer Computer-based Condition Monitoring and Data Acquisition Techniques

Focuses on the application of computer technology to the measurement of plant parameters such as vibration, and diesel engine cylinder pressures. The course is conducted in the laboratories and workshops at PMTC where students will use a number of different software packages to obtain data from running equipment, and then analyze that data. Enrolment will be limited to four students.

Course Length

30 hours.

Prerequisites

Basic knowledge of DOS is essential, and a Fourth Class Marine Engineer Certificate of Competency (or higher) is preferred.

NAUTICAL PROGRAMS

The Pacific Marine Training Campus offers a variety of preparatory courses leading to Canadian Coast Guard examinations for certification of masters and mates of commercial and fishing vessels. Each program contains a number of courses which comprise the material on which the candidate will be examined by the CCG. **Descriptions of the courses within each program follow on page 259.** For Simulated Electronic Navigation (SEN) and Automatic Radar Plotting Aids (ARPA) course descriptions, please see the section on Electronic Navigation.

PMTC is currently seeking accreditation of some courses. Successful completion of accredited modules will exempt a student from CCG examinations for that subject. If accreditation is granted by the Canadian Coast Guard, the duration of some courses may be affected.

Note: Throughout the program descriptions, prerequisites and sea service requirements are provided. These are for general information purposes only, and are not intended to replace the specific CCG regulations governing prerequisites and sea service requirements. It is the responsibility of the student to obtain specific information regarding these regulations from the nearest CCG Nautical Examination Centre. All decisions regarding eligibility and assessment of sea service are determined by the CCG Examiner.

Instructors

S. Barron
M. Brown
R. Goeller, Chief Instructor, Seamanship and Electronic Navigation
B. Howe
P. Ireland
R. Kitching, Chief Instructor, Nautical
T. Noack
M. Rudrakumar

WATCHKEEPING MATE

This program prepares participants for all CCG examinations leading to the Watchkeeping Mate (WKM) Certificate of Competency. The WKM Certificate qualifies the holder to carry out duties as a 3rd Mate on a Foreign Going vessel, or as a 2nd Mate on a Home Trade Vessel.

Program Length

19 weeks.

Prerequisites

None.

Sea Service Requirement

24 months.

Program Content

041 Chartwork
061 Navigation Safety
Simulated Electronic Navigation I (SEN I) part A
Simulated Electronic Navigation I (SEN I) part B
151 General Ship Knowledge
161 General Seamanship

Note: When applying for the final oral CCG examination for the WKM certificate, an applicant must submit:

- valid SIM 1
- proof of completion of Marine Emergency Duties training MED A-1, B-1, B-2, and C
- proof of completion of Standard First Aid
- a Restricted Radio Operator's Certificate

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First Aid and MED courses are not included in the Watchkeeping Mate program but they are offered by PMTC. Students are advised to complete these requirements before the start of the WKM program. Assistance for students preparing for the Restricted Radio Operator's Exam is also available. Please contact the Registration Office, or the Watchkeeping Mate instructor for more information.

Students planning a career on foreign-going vessels are advised to take the 051 Astro-Navigation module also, which is not a part of the WKM program.

COMMAND ENDORSEMENT

This program prepares the holder of the WKM Certificate for Command Endorsement examinations. The WKM Certificate with a Command Endorsement qualifies the holder to act as a Master of a vessel not exceeding 350 tons gross tonnage (within the Home Trade limits), or of a tug of any size.

Program Length

7 weeks.

Prerequisite

Watchkeeping Mate Certificate of Competency.

Sea Service Requirement

36 months.

Program Content

072 Meteorology
090 Industrial Safety and Ship Management
160 General Seamanship

Note: Applicants for the final CCG examination leading to the endorsement must also show proof of completion of:

- Simulated Electronic Navigation (SEN) II, and SIM 2
- MED C
- MED D
- valid Standard First Aid

These are not included with the Command Endorsement program, and must be enrolled separately.

OCEAN NAVIGATOR II (ON II)

This program prepares the participant for the CCG examination leading to the issuance of the ON II Certificate of Competency, which qualifies the holder to act in the capacity of a 2nd Mate on a Foreign Going vessel or a 1st Mate on a Home Trade vessel.

Program Length

20 weeks.

Prerequisites

Watchkeeping Mate Certificate of Competency.

Sea Service Requirement

12 months in charge of a watch while in possession of a Watchkeeping Mate Certificate.

Program Content

051 Astro-Navigation
091 Industrial Safety and Ship Management
112/113 Stability
122 Ship Construction and Cargo
162 General Seamanship

In addition, students are required to pass examinations in:
012 Communications,
132 Mechanical Engineering
Tutorial assistance is available for preparation for these examinations.

Note: Applicants for the final CCG examination for the ON II Certificate of Competency must also show proof of:

- valid Simulated Electronic Navigation (SEN) I, and SIM 1
- MED part C
- valid Standard First Aid

These are not included with the ON II program, and must be enrolled separately.

OCEAN NAVIGATOR I (ON I)

This program prepares the participant for CCG examinations leading to the issuance of the ON I Certificate of Competency, which qualifies the holder to act in the capacity of a 1st Mate on a Foreign Going vessel or a Master on a Home Trade vessel.

Program Length

21 weeks.

Prerequisites

ON II Certificate of Competency.

Sea Service Requirement

12 months while holding an ON II Certificate of Competency.

Program Content

052 Astro-Navigation and Electronic Navigation
062 Navigation Safety
073 Meteorology
092 Industrial Safety and Ship Management
123 Cargo
133 Construction and Engineering Knowledge
163 General Seamanship

Note: Applicants for the final examinations leading to the ON I certificate of competency must also show proof of the following:

- valid Simulated Electronic Navigation (SEN) II, and SIM 2
- MED part D
- valid Standard First Aid

These are not included with the ON I course and must be enrolled separately.

MASTER MARINER

PMTC does not currently offer a program for students preparing for the CCG examinations leading to the Master Mariner Certificate of Competency. However, the following subject areas are available in cooperation with the Marine Engineering section:
114 Naval Architecture
134 Engineering Knowledge

Prerequisite

ON I Certificate of Competency.

Sea Service requirement

12 months in charge of the watch while holding an ON I Certificate of Competency, on vessels of at least 25 gross registered tons.

Facilities are available for self study for the 093 Ship Management, 023 Electronics, and the 163 General Seamanship examinations. Qualified candidates should contact the Marine Certification Advisor for more information.

Applicants for the final examination leading to the Master Mariner Certificate of Competency must also show proof of:

- valid Simulated Electronic Navigation (SEN) II, and SIM 2
- MED D
- valid Standard First Aid

MASTER, MINOR WATERS

This course prepares the participant for CCG examinations leading to the issuance of a Master Minor Waters Certificate of Competency, which qualifies the holder to act in the capacity of a Master of vessels on the Minor Waters of Canada, (the lakes and rivers of Canada, excluding the Great Lakes and Lake Winnipeg).

Program Length

7 weeks.

Prerequisites

None.

Sea Service Requirement

12 months.

Program Content

Chartwork and Pilotage
Shipmaster's Business and Shipboard Knowledge

Note: Candidates for the examinations must present the following certificates:

- Restricted Radio Operator's Certificate;
- Marine Emergency Duties: MED A-1, MED B-1 and MED B-2;
- Standard First Aid

These are not included with the Master Minor Waters program, and must be enrolled separately.

FISHING INDUSTRY PROGRAMS

FISHING MASTER CLASS IV

This program prepares candidates for CCG examinations which lead to the issuance of the Fishing Master IV Certificate of Competency, which qualifies the holder to act as Master of a fishing vessel less than 100 gross registered tons within Home Trade 2 limits.

Program Length

8 weeks (including MED A-2).

Prerequisites

None.

Sea Service Requirements

12 months.

Program Content

020 Navigating Instruments
040 Chartwork and Pilotage
061 Navigation Safety
166 General Seamanship
Marine Emergency Duties A-2

Note: Entrance to the final part of the CCG examination is conditional on the candidate producing the following certificates:

- Marine Emergency Duties A-2
- Restricted Radio Operator's Certificate
- Standard First Aid

The MED A-2 is now included with this program, however the Radio Operator's Certificate, and Standard First Aid are not included, and must be enrolled separately.

FISHING MASTER CLASS III

This course prepares the participant for CCG examinations leading to the issuance of the Fishing Master III Certificate of Competency, which qualifies the holder to act in the capacity of Master of any fishing vessel within Home Trade 2 limits.

Program Length

12 weeks.

Prerequisite

None.

Sea Service Requirement

24 months.

Course Content

011 Communications
020 Navigating Instruments
041 Chartwork and Pilotage
061 Navigation Safety
157 General Ship Knowledge
167 General Seamanship
Marine Emergency Duties A-2

Note: Entrance to the final part of the CCG examination is conditional on the candidate producing the following certificates:

- Marine Emergency Duties A-2
- Restricted Radio Operator's Certificate
- Standard First Aid

The MED A-2 is now included with this program, however the Radio Operator's Certificate, and Standard First Aid are not included, and must be enrolled separately.

FISHING MASTER CLASS I AND II

Due to insufficient demand, PMTC does not currently offer any programs to prepare candidates for the CCG examinations leading to the issuance of the Fishing Master I and II Certificates of Competency. However, tutorial facilities are available at PMTC. Some modules required for FM I and FM II are offered within the Command Endorsement and ON II programs. Qualified candidates should contact the Marine Certification Advisor for additional information.

Nautical and Fishing *Course Descriptions*

The list following is not a syllabus, but does provide a general description of some of the topics covered within each course.

Please note: These courses will be assigned course reference numbers by January 1996

011 Communications — International code flags; single letter signals; use of the International Code of Signals to code and decode messages in flag, morse and voice communications.

012 Communications — Morse code using a flashing light or sound signals; recognition of all international Code flags; coding and decoding; communication practice and procedure.

020 Navigating Instruments — Use of radar, Decca and Loran; use of operator's manuals; recognition of errors; limitations of the equipment.

040 Chartwork and Pilotage — Reading a chart; light and sound signals; plotting a course allowing for wind and tide: notices to Mariners and chart corrections; determining compass errors; determining the ship's position by basic methods.

041 Chartwork and Pilotage — Determining the ship's position by advanced methods, and plotting courses allowing for wind, tide, and current; use of navigational charts and publications; navigation within confined waters; bridge practices and procedures.

051 Astro-Navigation — Parallel, plane and Mercator sailing; calculation of great circle routes; position lines by celestial navigation methods; theory and mechanics of the sextant; practical use of sextant and chronometer.

052 Astro and Electronic Navigation — The satellite, Decca and Loran navigation systems; the use of the inertial navigation system; explanation of the radar set and the echo sounder; the correction of errors found in various navigation systems; the earth's magnetic field, the magnetic compass and corrections of errors; the gyro compass and correction of errors.

061 Navigation Safety — Interpreting and applying the International Regulations for Preventing Collisions at Sea; their Canadian Modifications; and the recommended Code of Navigation Practices and Procedures.

062 Navigation Safety — A detailed study of multi-ship traffic situations and the applicability of the traffic regulations in collision avoidance.

072 Meteorology — The effect of pressure difference on wind speed and direction; the relationship between temperature, humidity and fog; elementary frontal theory; the major air masses and their distribution; association of cloud formation with atmospheric conditions; sea states and major surface currents; revolving storms.

073 Meteorology — All materials covered in Meteorology 072 with the addition of material on routing of ships to obtain the greatest advantage from predicted weather conditions and the analysis and plotting of weather information.

090 Industrial Safety and Ship Management — Canada Shipping Act; Pilotage Act; legislation and regulations regarding safety, response to emergencies, quarantine, and oil pollution prevention; customs procedures; marine insurance contracts; agents; stability for small boats.

091 Industrial Safety and Ship Management — Legislation and regulations regarding the rights, privileges, and obligations of crew; inspection, testing, and maintenance of cargo gear; safe working practices; prevention of oil pollution; crew organization for emergencies.

092 Industrial Safety and Ship Management — Canada Shipping Act; Pilotage Act; safety regulations; response to emergencies; oil pollution prevention; Regulations covering ship operation, insurance, bills of lading, customs procedures, Canadian Labour Code, health provisions and food, quarantine and deviation; the Criminal Code as it affects shipmasters, agents, salvage, obligations of the master in the event of disaster.

112 Stability — Calculation of the forces contributing to the stability of a ship; effect of adding, moving, or removing weight; the free surface effect and its danger in a listed ship; use of the ship's assigned loadline and stability data to maintain safe operating conditions.

113 Stability — Covers all material in Stability 112, but also includes the mathematical treatment of intentional and unintentional flooding of compartments, and the application of Simpson's Rules.

122 Ship Construction and Cargo — Construction and maintenance of the steel ship, including the arrangement of the main hull members, and the construction of the bow and stern of the ship; loading, carriage and discharge of cargo; Cargo Codes and stowage plans; compilation of defect lists; preparation for dry-docking and surveys.

123 Cargo — The application of Cargo Codes; stowage of bulk grain and timber deck cargoes; the carriage of containers; refrigerated cargo; livestock as cargo; carriage of bulk liquids and gases; the particular aspects of loading the major types of ships, including OBO, RO-RO, VLCC, large ferries and container ships.

132 Mechanical Engineering — The arrangement of bilge, ballast and cargo piping systems; arrangement and operation of fire detection and extinguishing systems; tank content and draught measurement; arrangement of deck machinery; reciprocating pumps and rotary pumps.

133 Construction and Engineering Knowledge — Hull construction methods, including the watertight bulkhead, and strengthening the forward and aft ends of a ship; engine room layouts for steam propulsion and diesel propulsion, including electrical transmission of main propulsion power; elementary hydraulic, pneumatic and electrical control systems; stresses caused by cargo, ballast and the sea; the conditions of assignment of a loadline; preparation of simple repair specifications.

151 General Ship Knowledge — The basics of ship construction; common ship types; fundamentals of ship stability; cargo handling arrangements; basics of loading and discharging various cargoes; strengths of ropes, wires and chains; regulations regarding prevention of accidents and pollution.

157 General Ship Knowledge — The basics of fishing vessel construction; stability of fishing vessels in various conditions of loading; the effect of free surface, suspended weights and external ice formation; strength of rope, wire and chain; pollution prevention procedures; use of the International Code of Safety for Fishermen.

160 General Seamanship — Collision Regulations; Navigating Practices and Procedures Code; Rules of the Road for the Great Lakes; duties and responsibilities of the master, including: ship handling with fixed or variable-pitch propeller(s) in normal conditions, heavy weather conditions, and in situations of distress; search and rescue operations; dry-docking procedures; crew organization.

161 General Seamanship — Collision Regulations; Code of Navigating Practices and Procedures; Rules of the Road for the Great Lakes; practical bridge organization; duties and responsibilities of the officer of the watch in port, at sea, at anchor, and in emergencies; standing orders; ship anchors, mooring and mooring lines; rigging of ships and booms; and manoeuvring characteristics of merchant vessels.

162 General Seamanship — Collision Regulations; Code of Navigating Practices and Procedures; Rules of the Road for the Great Lakes; all aspects of the duties of a mate acting as second-in-command of a ship, including: care and maintenance of deck machinery; manoeuvres in confined waters; anchoring; towing and mooring ships; preparation of cargo gear for loading; overhaul of cargo gear; elimination of mechanical errors in a sextant; organization for emergencies.

163 General Seamanship — Collision Regulations; Code of Navigating Practices and Procedures; Rules of the Road for the Great Lakes; all aspects of the duties of the master of a ship in the North American continental trade, including: ship handling in normal conditions, heavy weather conditions and in situations of distress; search and rescue procedures; precautions to be taken to safeguard the structure of a ship entering dry dock; organization of the ship's crew for normal duty and emergency duty.

166 General Seamanship — Safe working practices on fishing vessels; the practical considerations of boat handling in heavy weather; the maintenance of a deck log; pollution prevention; reading, taking and applying compass bearings; Master's responsibilities in an emergency.

167 General Seamanship — All material in General Seamanship 166 plus preparation of a fishing vessel for survey and inspection; weather reports and weather systems; Collision Regulations.

ELECTRONIC NAVIGATION COURSES

PMTC uses radar and electronic navigational aids simulators to train students in navigation and collision avoidance. The variety of programs available in this field enable the student to understand the principles and operation of electronic navigational equipment, its capabilities and its limitations. Students will learn how to apply these principles in practice, to navigate safely and effectively, avoiding collisions and groundings.

PMTC has a well-established reputation for the quality of its radar simulator courses. They have been available at PMTC since 1975, when the first Solatron simulator was acquired. This equipment has since been periodically upgraded, and in September 1993 the installation of new blind pilotage simulators now provides students with a state of the art training facility.

PMTC's simulators allow coastline generation. Navigational aids, such as GPS, Loran C, Decca Navigator and Radio Direction Finder are available for position fixing. The student has total control of wheel and engine, to undertake realistic navigational and anti-collision exercises in restricted visibility. VHF is provided for radio communication between ships, and with shore stations. The latest Automatic Radar Plotting Aids (ARPA) are also available for enhanced training. All exercises are automatically recorded to facilitate subsequent analysis and discussion during debriefing sessions.

Simulated Electronic Navigation I (SEN I): Part A - Navigating Instruments — This course is an introduction to navigating instruments for junior bridge officers. It is a CCG approved course and is a prerequisite for the SEN I part B: Basic Radar Simulator Course. PMTC is authorized to issue a CCG Training Certificate upon successful completion of this course.

Course Length
4 weeks.

Prerequisites
None. However, it is strongly recommended that the 041 Chartwork and 061 Navigation Safety courses are completed prior to the SEN I.

Sea Service Requirement
18 months.

Course Content
Students acquire basic knowledge of navigating instruments through an introduction to navigating instruments such as radar (analog and ARPA), radio direction finder, Decca, Loran, Omega, Satnav, GPS, Echosounder, etc. Students study the following topics: use of controls; derivation of information; data correction and use of data in position fixing and collision avoidance; recognition of false information and malfunctions; radar plotting techniques.

Simulated Electronic Navigation I (SEN I): Part B - Basic Radar Simulator Course — This is a CCG approved practical exercise course on the radar simulator. It is required for the Watchkeeping Mate Certificate of Competency. PMTC is authorized to issue a CCG Training Certificate upon successful completion of the course. Following the last day of the course, a practical examination (SIM 1) is conducted by a CCG examiner.

Course Length
13 days (includes 1 day for SIM 1 examination).

Prerequisite
SEN I part A.

Course Content
In practical exercises on a radar simulator, students learn to navigate in coastal and open waters, near and within traffic separation schemes using radar (analog and ARPA) and other electronic navigational aids, and while in compliance with Collision Regulations, to take collision avoidance action in restricted visibility in relatively simple encounters.

Simulated Electronic Navigation II (SEN II) - Advanced Radar Simulator Course — In this course, participants perform and supervise individual bridge duties as Master in charge of a vessel. It is a CCG approved course, and is a requirement for any certificate of competency with command validity. PMTC is authorized to issue a CCG Training Certificate upon successful completion of the course. On the last day of the course, a practical examination (SIM 2) is conducted by a CCG examiner.

Course Length
15 days (includes 1 day for SIM 2 examination).

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Prerequisites
SEN I parts A and B.

Course Content
Students learn to navigate safely and plot effectively using all available navigational aids, including analog radar and ARPA, in: open waters, confined and/or congested waters, and within or near traffic separation schemes. Students are trained to navigate safely and effectively using: the principles of passage planning, parallel index techniques and ship manoeuvring data; to respond to distress calls; to organize search and rescue operations.

Automatic Radar Plotting Aids (ARPA) — This course provides specialized training in use of ARPA. It is a CCG approved course, and is a requirement for any bridge watchkeeping officer navigating a vessel equipped with ARPA radar. PMTC is authorized to issue a CCG Training Certificate upon successful completion of the course.

Course Length
5 days.

Prerequisites
SEN I parts A and B.

Course Content
Students learn to navigate safely and effectively using radar/ARPA within confined and/or congested waters, and within or near traffic separation schemes.

SEAMANSHIP PROGRAMS

MARINE EMERGENCY DUTIES

All Marine Emergency Duties (MED) training provided at PMTC is approved by the Canadian Coast Guard. It also meets the requirements of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, and the Resolution of the International Maritime Organization for basic training in personal survival, operation of life saving equipment and marine fire fighting.

For information regarding MED training requirements for marine certification, it is recommended that you contact the Canadian Coast Guard, Ship Safety Branch. In the Vancouver area the telephone number is (604) 666-3636.

The Pacific Marine Training Campus cooperates with the Justice Institute of B.C. to conduct some parts of the MED training at the Fire and Safety Training Centre in Maple Ridge B.C.

Importance Notice Regarding MED Training: Training in marine fire fighting, and in the use of lifeboats and liferafts, requires a student to engage in moderately strenuous physical activity. For example, a student must carry equipment and fight a fire while wearing a self-contained breathing apparatus, and a student must single-handedly right a large capsized liferaft while in water 7 feet deep (in the training tank). None of these activities is beyond the capability of an active person in a reasonably good state of health. To ensure that every student is aware of the physical activity involved in the course, at the beginning of the course, PMTC will require each student to sign a Declaration. A student who does not sign the Declaration will not be permitted to continue in the course. The Declaration is as follows:

"On the understanding that the physical activities described by the instructor as being necessary for the completion of the course are well within the capability of an active person in ordinary physical condition, I declare that to the best of my knowledge there is no reason why I should not take part fully in those activities."

Instructors
R. Goeller, Chief Instructor, Seamanship and Electronic Navigation
J. Kenefick
R. Kitching, Chief Instructor, Nautical
J. Perdriel
V. Wieruszewski

MARINE EMERGENCY DUTIES A-1: BASIC SAFETY COURSE

This course is designed for new entrants to the marine industry, and for personnel who have not received any formal training in marine emergency situations. The course provides mariners with a basic understanding of: the hazards associated with the marine environment and their own vessel; the prevention of shipboard incidents (including fires); raising and reacting to alarms; fire, and abandonment situations; the skills necessary for survival and rescue. It is strongly recommended that all seafarers complete this course within six months of first going to sea.

Course Length
3 days, 0830 to 1600 daily.

Course Location
Day 1 - PMTC, North Vancouver
Day 2 - JIBC-FSTC, Maple Ridge
Day 3 - PMTC, North Vancouver

Prerequisite
None.

Course Content
Hazards and Emergencies — Safe practices and procedures; fire and explosions; structural failure; foundering and grounding; cargo emergencies; man overboard situations; medical emergencies.

Fire Fighting — Heat and radiation feedback; fuels and oxygen; fire classes; fire spread and its control; fire extinguishers; personal protection and backup.

Emergency Response — Emergency organization; emergency signals and muster; duties in an emergency.

Lifesaving Appliances — Donning and wearing lifejackets; donning and wearing immersion suits; use of lifebuoys; lifeboats and liferafts; launching systems; launching, manoeuvring and boarding a liferaft; righting a capsized liferaft.

Survival — Human behaviour under survival conditions; discipline and morale; shelter and hypothermia; dehydration and lack of food; clearing a ship in survival craft; lookout and gathering of other survivors; swimming in a group; HELP position.

Rescue — Emergency Position Indicating Radio Beacon (EPIRB); daylight signalling devices and flares; rescue sling, basket, net, litter.

MARINE EMERGENCY DUTIES A-2: SMALL VESSEL SAFETY COURSE

This course is designed for Officers and Crew of small commercial vessels (up to 40 tons gross tonnage). It is also recommended for pleasure craft operators. Small craft operators and their crew will learn about hazards associated with the marine environment; prevention of accidents and fires; fighting shipboard fires; abandoning ship; survival and rescue; maintaining a state of readiness for an emergency.

Course Length

4 days, 0830 to 1600 daily.

Course Location

Day 1 - PMTC, North Vancouver
Day 2 - JIBC-FSTC, Maple Ridge
Day 3 & 4 - PMTC, North Vancouver

Prerequisites

None.

Course Content

Hazards and Emergencies — Safe practices and procedures; fire and explosion; structural failure; foundering and grounding; cargo emergencies; man overboard situations; medical emergencies.

Emergency Response — Emergency organization and response planning; emergency signals and muster; duties in emergency parties; drill and training sessions; preparing a safety manual.

Fire Fighting — Heat and radiation feedback; fuels and oxygen; fire classes; fire hazards and personal protection; fire spread and its control; fire fighting outfit and equipment; fire extinguishers: construction, inspection, maintenance; fixed fire fighting systems: inspection and maintenance; assessment of fire situations; attack on fire; post fire action; fire protection in port.

Lifesaving Appliances — Donning and wearing a lifejacket and immersion suit; lifebuoys, lifeboats and liferafts: construction, inspection, maintenance; launching systems; launching, boarding and manoeuvring liferafts and lifeboats, marshalling liferafts; righting a capsized liferaft.

Survival and Rescue — Human behaviour under survival conditions; discipline and morale; hypothermia, dehydration and lack of food; organization and leadership techniques; rescue equipment and signalling devices; preparation and conduct of search and rescue equipment and signalling devices; preparation and conduct of search and rescue; Search and Rescue (SAR) in Canada; rescue coordination centres; Master's responsibility.

MARINE EMERGENCY DUTIES B-1: SURVIVAL CRAFT COURSE

This course is designed for candidates for Master Minor Waters and Junior Officer certifications, and for certificated ratings. Such personnel are required to complete a comprehensive MED training program of which B-1 is one component. Participants will learn: orderly abandonment of a vessel in an emergency situation; clearing the vessel; proper and effective use of equipment; coordinating survival activities during rescue operation.

Course Length

5 days, 0830 to 1600 daily.

Course Location

PMTC, North Vancouver

Prerequisites

MED A-1 or MED A-2
It is recommended that trainees acquire a minimum of 3 months sea time before enrolling in this course.

Course Content

Lifeboats — Basic requirements for open, partially enclosed, and totally enclosed lifeboats; basic construction and equipment; basic requirements for fast rescue craft; lifting hooks and release mechanisms.

Lifeboat Launching Systems — Types of davits; permanently inclined track system; falls and running gear; inspection and maintenance; personnel requirements; drills and muster; recovery arrangements; embarkation ladders and lighting systems.

Practical Boatwork — Safe practices and procedures; boat and equipment check; launching and clearing; rowing and rowing orders; starting and operating an engine; handling of propeller driven craft; handling a craft in rough weather.

Liferafts — Construction and characteristics; components, equipment and markings; stowage on ships, float-free system; davit launch and high speed evacuation; inspection and maintenance.

Practical Raftmanship — Preparation for, and launching of, a liferaft; loading and/or boarding; boarding from water; manoeuvring, propulsion, repairs.

Abandonment — Recovery of persons from the water; post-abandonment action; marshalling lifeboats and liferafts; towing precautions.

Survival and Rescue — Human behaviour under survival conditions; physiological and physical stress; preparation and positioning for rescue; helicopter and surface craft rescue; communication and signalling equipment.

MARINE EMERGENCY DUTIES B-2: MARINE FIRE FIGHTING COURSE

This course is designed for candidates for Master Minor Waters and Junior Officer certifications, and for certificated ratings. Such personnel are required to complete a comprehensive MED training program, of which B-2 is a component. Participants will gain the knowledge and skills necessary to contain and extinguish shipboard fires; to be aware of fire hazards; to implement fire prevention measures; and to use equipment properly and effectively.

Course Length

5 days, 0830 to 1600 daily.

Course Location

JIBC-FSTC, Maple Ridge.

Prerequisites

MED A-1 or MED A-2
It is recommended that trainees acquire a minimum of 3 months sea time before enrolling in this course.

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Course Content

Marine Fire Theory — Theory of fire; classes of fire; stages of fire; techniques of fire fighting; duties of team members.

Marine Fire Safety and Prevention — Systematic attack methods; fire prevention techniques; crew training and fire drills.

Protective Gear and Rescue Techniques — Protective clothing and equipment; techniques of ventilation; planning a search and rescue operation; methods of handling casualties.

Fire Extinguishing Equipment and Agents — Fixed systems; portable extinguishers (dry chemical, water, foam, carbon dioxide); use of portable extinguishers on pan fires; use of foam equipment; use of hoses and nozzles; practice the extinguishing of round tank and T-pit fires.

Ship Construction and Arrangement — Class A, B, and C divisions; various types of hatches, manual and automatic doors; identify ship ventilation control systems and their operation.

On Board Control Measures — Fire fighting techniques; pre-planning of emergency response; duties of the team leader; duties of the team member; full-scale field exercises; review and planning for onboard fire prevention, and fire fighting strategies.

MARINE EMERGENCY DUTIES C: OFFICER CERTIFICATION COURSE

This course is designed for Deck and Engineer Junior Officers of commercial vessels. Participants will learn to: competently and confidently inspect and maintain all emergency equipment; maintain fixed fire detection and extinguishing systems; respond professionally to an emergency; keep a log of salient events during an emergency; control passengers and untrained personnel during an emergency; respond professionally to a distress call and execute a search and rescue of survivors; conduct formal onboard familiarization and training sessions.

Course Length

3 days, 0830 to 1600 daily.

Course Location

Day 1 and 2 - PMTC, North Vancouver
Day 3 - JIBC-FSTC, Maple Ridge

Prerequisites

MED B-1 and MED B-2.

Course Content

Fixed Fire Fighting and Detection Systems — Capabilities and limitations of systems; safe practices and procedures; combination and interrelation of detection and extinguishing systems.

Inspection and Maintenance — Periodic inspection and service intervals of all emergency equipment; inspection, maintenance and refilling of portable fire extinguishers; inspection and maintenance of fixed fire detection and extinguishing systems; hoses, hydrants and associated equipment; abandoning gear and associated equipment.

Emergency Response and Team Leadership — Initial response of a watch; turning over responsibility; leadership styles; duties of an emergency team.

Fire Fighting On-Scene Leader — Ship's plans; assessment of fire situation; course of action; free surface effect and its effect on ship stability; hourly output of fire fighting appliances; internal search and rescue.

Incident Recording — Recording salient events during an emergency.

Crowd Management — Controlling and directing a crowd; passengers as assistants to crew; communication.

External Search and Rescue — Distress call procedures; initial response to a distress signal; planning and execution of a search; preparation for recovery.

Conduct of Training Sessions — Planning and preparing training; instructional techniques; onboard familiarization course.

MARINE EMERGENCY DUTIES D: SENIOR OFFICER COURSE

This course is designed for candidates for senior certificates of competency required for both deck and engine room positions. The participants will learn to: ensure that junior officers, key personnel and emergency response teams are properly prepared and organized to deal with any emergency situation; assess damage to the vessel, evaluate degree of danger and coordinate the response to minimize the effect of the damage; coordinate response to an emergency situation on their own vessel (and to other vessels) in distress.

Course Length

2 days, 0830 to 1600 daily.

Course Location

PMTC, North Vancouver.

Prerequisites

MED C.

Course Content

Contingency Plans — Criteria for development of the plan; emergency muster list as per the Canada Shipping Act and the Safety of Life at Sea (SOLAS) convention; use of equipment and personnel; operation sequence diagrams; analysis of Marine Casualty Investigation Reports.

Training and Emergency Drills — Regulations and requirements for drills; preparation of the crew for emergencies; planning, management and conduct of training sessions and drills.

Emergency Management — Managing an emergency response; assimilation of data; procedures, language and methods of internal communications; leadership styles; case studies.

Damage Control — SOLAS requirements for subdivision and stability; permeability and use of stability data; pressure acting bulkheads; flood rates from damaged areas; draining of excess water; pollution; fire fighting with water and the corresponding effect on the ship's stability.

Abandon Ship Decision — Reason and conditions for abandonment; partial and total abandonment; signals and documentation.

Search and Rescue (SAR) (Program Under Review) — Procedures and facilities for SAR; Automated Mutual-Assistance Vessel Rescue (AMVER) system; Master's role in planning and conducting a SAR mission; on-scene coordinator; shiphandling when rendering assistance to other vessels, or survivors in the water.

BASIC OFFSHORE SURVIVAL ENDORSEMENT COURSE - BOSC

BOSC was developed as an addendum to Marine Emergency Duties (MED) training, to provide survival training for all regular personnel scheduled to work on Mobile Offshore Drilling Units (MODU). It meets Canada Oil and Gas Lands Administration standards, and has that organization's approval for mandatory basic offshore survival training of personnel engaged in offshore operations the Beaufort Sea.

Course Length

1 day, 0830 to 1730.

Prerequisites

Participants must hold at least one valid certificate from the following list of MED training certificates:
MED I, or MED II, or MED A-1, or MED B-1 and B-2

Course Content

Hazards and Emergencies — Fire, explosion, blowout; ice, weather alerts, exposure; environment emergencies (including some WHMIS information); industrial hazards.

Emergency Response — Alarm signals and muster stations; emergency communications; primary and secondary escape route; crown logistics.

Prevention, Detection and Control of Fire — Housekeeping; fire spread; ventilation.

Abandonment and Survival — Helicopter evacuation; personnel basket; liferafts; escape slide; "Jacob's ladder"; scramble nets; survival suits; Totally Enclosed Motor Propelled Survival Craft (TEMPSC).

Enemies of Survival — Exposure; survival on ice; dehydration.

Search and Rescue — SAR for Arctic Regions; transfer of personnel from TEMPSC to vessel; sea rescue by vessel with Bennix basket; sea rescue by helicopter.

Helicopter Safety and Emergency Procedures — Planned and emergency landings; helicopter water evacuation (upright and inverted); associated hazards, such as fire, water intrusion and disorientation.

DECKHAND TRAINING PROGRAM

This program has been developed in response to requests from the industry. It provides pre-employment training in all aspects of basic seamanship for persons interested in entering the marine industry as deckhands. The course will prepare students for service on commercial vessels, and will emphasize the following areas: marine safety and survival, general seamanship, watchkeeping, and teamwork abilities. The course is approved by the Canadian Coast Guard, and — upon successful completion — the following training certificates will be issued:

- New Entry Seaperson
- MED A-1
- MED B-1
- MED B-2
- Standard First Aid
- Workplace Hazardous Materials Information System.

Course Length

12 weeks, 0830 to 1600 daily.

Course Location

All training is conducted at PMTC, North Vancouver except some portions of the MED, which are conducted at JIBC-FSTC, Maple Ridge, and one week of practical training on board a vessel.

Prerequisites

No experience is required to enter the course, however completion of Grade 10 is essential. Good health and physical fitness are required. Applicants should obtain a certificate from an optometrist affirming good vision in accordance with Canadian Coast Guard specifications.

Sea Service Requirement

None.

Course Content

Ships — Terminology; crew organization; duties; ship construction; cargo handling gear.

Mooring Systems — Types of ropes and wires; knots and splices; anchors and cables; windlass and capstans; self-tensioning winches; towing winches and hooks; emergency towing lines.

Ship Maintenance — Rust protection and painting; shipboard housekeeping; equipment upkeep; rope, wire and towing gear maintenance; pollution prevention.

Bridge Watchkeeping — Steering; lookout; communication equipment; Canadian Buoyage System; navigational aids; rules of the road; charts, and chart symbols.

Marine Emergency Duties — Hazards and emergencies; lifesaving appliances; drills and signals; survival; fire fighting; first aid; rescue.

NET MENDING

This course is designed to enhance the ability of deckhands, skippers and vessel owners in net maintenance and construction.

Course Length

2 weeks.

Prerequisites

None.

Course Content

Students study the basic construction of seine, trawl and gillnets, and learn to mend and overhaul nets. Students also learn to splice, tie useful knots, and hang bailers.

TANKER SAFETY COURSES

A person in charge of transfer of petroleum products must hold either a Supervisor of Oil Transfer Operations (SOTO) certificate, or a Petroleum Tanker Endorsement certificate.

SUPERVISOR OF OIL TRANSFER OPERATIONS (Program Under Review)

To qualify for the SOTO certificate, a candidate must meet one of the following requirements:

1. 24 months seatime on a tanker or tank barge in a capacity requiring involvement in transfer of petroleum products operations; or
2. 3 months seatime on a tanker or tank barge in a capacity requiring involvement in transfer of petroleum products operations, and successful completion of the CCG SOTO oral examination; or
3. Successful completion of an approved SOTO course.

Course Length

5 days, 0830 - 1600 daily.

Course Location

All days at PMTC, North Vancouver, with the exception of one field day to be arranged during the week.

Prerequisites

M.E.D. training is recommended. Contact the CCG Ship Safety office for specific requirements.

Course Content

Students will learn basic problems and health hazards associated with the handling and transport of petroleum products. Equipment used for the transfer of petroleum products, such as pumps, valves, pipelines and hoses, will also be discussed. Practical exercises will include ullaging and calculation of contents of a tank, as well as preparation of the deck for transfer operations.

ADVANCED PETROLEUM TANKER SAFETY COURSE

This course is approved by the Canadian Coast Guard, and meets the requirements of the International Convention on Standards of Training, Certification, and Watchkeeping (STCW) for seafarers, and the resolution of the International Maritime Organization (IMO) for advanced tanker training, and the proper use of emergency equipment.

This course is intended to provide ship's officers with a comprehensive training package with an emphasis on the principles involved in the safe loading, transportation, and discharging of bulk petroleum cargoes. Theoretical and practical aspects of ship operation will also focus on improving the safety and health of personnel. Consideration will be given to crude, product, and combination carriers, including coastal tank vessels. Informal discussion is encouraged to facilitate an exchange of views between ship's officers engaged in different tanker trades. The course is presented by qualified Masters and Engineers, and in conjunction with shore personnel experienced in the areas of health and welfare. Successful participants will qualify for the appropriate level of CCG Petroleum Tanker Endorsement.

Course Length

8 days, 0830 - 1600 daily.

Course Location

All days will be conducted at PMTC, North Vancouver, with the exception of day 4, which will be conducted at the JIBC — Fire and Safety Training Centre in Maple Ridge.

Prerequisites

Course and Endorsement Requirements:
CCG Certificate of Competency
valid Marine Emergency Duties (MED) B-2.

Tanker Sea Service Requirement

Endorsement Level I: none
Endorsement Level II: 9 months

Course Content

Development of Petroleum Tankers
Petroleum Tanker Design and Construction
Applied Science
Health
Cargo Handling Systems
Operating Procedures
Inert Gas Systems
Crude Oil Washing
Tank Cleaning
Oil Pollution
Environmental Response
Regulations and Codes of Practice
Emergency Procedures
Fire Fighting
Safety Practices and Equipment
Mooring
Operations
Transfers of Cargo when not Alongside
Oil Measurement and Calculation

STANDARD FIRST AID TRAINING

In cooperation with St. John Ambulance, PMTC offers Safety Oriented First Aid at the Standard Level.

Course Length

2 days, 0830 - 1630.

Prerequisite

None.

Course Content

This comprehensive modular course includes workbook readings; audiovisual presentations; practical exercises; and examinations. Please note that the workbook assignment must be completed prior to attendance in class, so students are required to register at least one week in advance.

Topics include:
Principles of First Aid and Safety
General Anatomy and Physiology
Artificial Respiration
Wounds and Bleeding
Dressing and Bandages
Poisoning
Choking
Shock and Unconsciousness
Fractures
Medical Conditions
Head and Spinal Injuries
Burns
Cardiopulmonary Resuscitation
Child and Infant Resuscitation
Heart Attack and Stroke
Check Injuries
Eye Injuries
Casualty Management

SHIPPING AND MARINE OPERATIONS
(Program Under Review)

As part of the mandate to offer marine related education and training, the Institute is addressing land-based marine needs by offering an educational program in Shipping and Marine Operations. The interdisciplinary program is designed to prepare students for positions in the business community providing maritime services. For individuals already working in the industry, this program will enhance work experience, and offer an opportunity for meaningful study and research. These individuals are encouraged to apply as part-time students.

The first year of the Diploma program introduces the shipping industry, with an emphasis on basic knowledge and skills. The second year of the program allows the student the opportunity to specialize in selected areas of interest, which are necessary for those aspiring towards professional management positions.

The program emphasis is to prepare the student to function effectively within the work place by developing creative maturity and professional growth. Exposure to a broad base of the marine environment will provide knowledge of the processes of shipping, and these new skills will be reinforced with numerous field trips and assigned industrial work experience.

Prerequisites

Prospective students should apply for admission to the program as early as possible. Entry into the program is subject to a personal interview, high school grades, maturity, interests, aptitude and work experience. Although completion of Grade 12 is usually required, admission may be granted to mature students who have related work experience, or who can demonstrate evidence of probable success in the program.

FULL-TIME STUDIES
(Program Under Review)

DIPLOMA IN SHIPPING AND MARINE OPERATIONS

The Diploma Program is designed to provide students with the theoretical knowledge fundamental to the Shipping Industry, and its practical application. This full time, two year program is conducted with a day classes format. The Diploma will be awarded upon successful completion of a minimum of sixty (60) credits of study as specified in the course list following.

Course List (Program Under Review)

Note: Courses in the 100 and 200 numbered series refer to full-time first- and second-year Diploma program courses. The 300 numbered series courses refer to the part-time Certificate courses (with the exception of course 300.0 which is the work experience session done by all full-time students). The 400 numbered course refers to the final Diploma project. **(See chart on next page.)**

Instructors

J. Arnott
P. Durell
R. Hesp, Chief Instructor
R. Wotherspoon

Course Descriptions (Program Under Review)

101.1 Ship Operations I — Introduces various ship types and designs, ship stability and cargo operations. Topics will include the general arrangements of various ships, loadlines, classification, nautical terminology and cargo operations such as stowage and planning.

101.2 Ship Operations II — Compliments Ship Operations I by investigating the on board operation and management of modern vessels. Students will study navigation routing, weather patterns, physical limitations of vessels, ship board safety, fuel consumption, and vessel maintenance and daily requirements.

101.3 Commercial Shipping — Covers the four principal groups of shipping services: tramp services, liner shipping, special shipping and passenger shipping. These services will be introduced with reference to management, chartering and carrier broking.

101.4 Management in Shipping — Introduces the nature of organizations, principles of management styles and decision making in the business environment. These principles will be applied to ship management on board and ashore.

102.1 Port Operations I — Introduces the operation of sea ports and the Canadian Ports system. Students will investigate the port as a service to shipping, the infrastructure of marine terminals, and other port functions. Vancouver will be used as a model in comparing and contrasting other Canadian and international ports.

102.2 Port Operations II — Concentrates on the role which various business elements play in the management of shipping and marine operations. Commercial and operational aspects of shipping are investigated for both Canadian and international shipping. Students also study ships agency, cargo broking, customs broking, immigration and safety requirements at a local, national and international level.

102.3 Geography of Ocean Transportation — Assists in the understanding of international trade. Students study the global aspects of geography. Included in this course will be the study of international time, distance and geographic location as well as ocean features, and basic meteorology. Students will also study the world population distribution, national cultures, trade markets, commodities, and the major shipping routes.

102.4 Maritime Industrial Relations and Labour Economics — Introduces the concepts of maritime industrial relations. Students will study the influence of industrial relations on international trade. The impact on Canada's international trade will be analyzed through a comparison of industrial relations at a global level.

103.2 Business Communication — Encourages student involvement and interaction to enhance and develop communication skills used in operations management, and the business community.

103.3 Computer Studies — Introduces students to disk operating systems (DOS) using personal computers (PCs). Emphasis will be placed on the operation of various software packages to include: windows, word processors, spreadsheets, data bases, desk top publishing; as well as basic data management skills.

TRADES TRAINING

Course List

* indicates course within a selected program

Course Number	Title	Credits	Diploma	Program Certificate
101.1	Ship Operations I	(1.5)	*	
102.1	Ship Operations II	(1.5)	*	
101.3	Commercial Shipping	(1.5)	*	
101.4	Management in Shipping	(1.5)	*	
102.1	Port Operations I	(1.5)	*	
102.2	Port Operations II	(1.5)	*	
102.3	Geography of Ocean Transport	(1.5)	*	
102.4	Maritime Industrial Relations	(1.5)	*	
103.2	Business Communications	(3.0)	*	
103.3	Computer Studies	(3.0)	*	
103.4	Maritime Economics I	(1.5)	*	
103.7	Business Writing	(1.5)	*	
113.8	Business Mathematics	(3.0)	*	
113.9	Mathematics	(1.5)	*	
104.1	Seaborne Cargoes	(1.5)	*	
105.1	Maritime Law I	(1.5)	*	
105.2	Maritime Insurance I	(1.5)	*	

Course Number	Title	Credits	Diploma	Program Certificate
201.5	Broking & Chartering	(1.5)	*	*
201.6	Quantitative Methods in Shipping	(1.5)	*	*
202.5	Marine Terminal Operations	(3.0)	*	*
202.6	Intermodal Transportation	(3.0)	*	*
203.5	Maritime Economics II	(1.5)	*	
203.7	Steamship Marketing	(1.5)	*	
203.8	International Trade	(3.0)	*	
203.9	Marine Documentation	(1.5)	*	
204.1	Dangerous Goods and Marine Pollution	(1.5)	*	
204.2	Cargo Planning	(3.0)	*	*
205.3	Maritime Law II	(1.5)	*	
205.4	Maritime Insurance II	(1.5)	*	
205.5	Carriage of Goods by Water	(1.5)	*	

Course Number	Title	Credits	Diploma	Program Certificate
300.0	Industry Awareness	(3.0)	*	
301.1	General Ship Knowledge	(3.0)		*
301.2	Management & Marine Industrial Relations	(3.0)		*
301.3	Business of Shipping	(3.0)		*
302.1	Port Administration and Management	(3.0)		*
303.1	Business Studies	(3.0)	*	
303.2	International Business and Trade	(3.0)		*
305.1	Maritime Law I and II	(3.0)		*
305.2	Maritime Insurance I and II	(3.0)		*

Course Number	Title	Credits	Diploma	Program Certificate
400.0	Diploma Project & Analysis	(3.0)	*	*

103.4 Maritime Economics I — Introduces the student to maritime economics, and provides an understanding of the basic economic principles underlying seaborne transportation.

103.7 Business Writing — Covers the principles of written communications in general business and professional activities. It will provide practice in the preparation of proposals, reports, and correspondence. Prerequisite: 103.2

113.8 Business Mathematics — Provides a reinforcement of the basic mathematics used in industry and commerce. Topics to be covered will include arithmetic, the applied use of calculators, algebra, and statistics. A general introduction to accounting and finance will emphasize the special needs of the shipping industry.

113.9 Mathematics — Applied algebra and statistics will challenge students in the interpretation of numerical data. The course will also include studies in areas of geometry, trigonometry, non-linear graphs, moments of inertia, and the basic concepts of calculus.

104.1 Seaborne Cargoes — Investigates marine cargoes, including: containerization, break bulk, liquid, grain, timber and bulk commodities. Emphasis will be placed on the cargoes, their carriage requirements, documentation, and applicable regulations.

105.1 Maritime Law I — Introduces the legal aspects of the shipping industry, including: ship registration, maritime liens, collision liability, pollution liability, the contract of carriage, the law of towage, the law of salvage, and marine arbitration.

105.2 Marine Insurance I — Introduces the principles underlying a marine insurance contract which include: utmost good faith, insurable interest, and indemnity. The marine insurance policies, and the B.C. Insurance (Marine) Act will also be examined.

201.5 Broking and Chartering Practice — Students will use the core program content of Commercial Shipping (101.3) to expand upon the practices of broking and ship chartering. Practical case studies will give the student an opportunity to put skills acquired into practice.

201.6 Quantitative Methods in Shipping — Complements maritime economics by applying mathematical methods to accepted theories. Students will study statistics, calculus, and probability as they apply to areas such as supply and demand, optimum speed, size and distance of ships, queuing, and decision theory.

202.5 Marine Terminal Operations — Covers the planning and design principles of Marine Terminals. The course will also include a study of the role a marine terminal plays in the process of cargo movement. Field trips will give students the opportunity to compare terminal operations, and investigate the specific needs of the maritime industry.

202.6 Intermodal Transportation — The movement of cargo involves various forms of transportation, including: rail, road, and ocean transportation. This course places ocean transportation in perspective with other modes of transportation, and emphasizes the importance of a transportation infrastructure.

203.5 Maritime Economics II — Presents a practical application of the maritime economic principles, building on the knowledge gained in Maritime Economics I (103.4). A series of case studies in various aspects of the shipping industry will be used to enhance the student's understanding of maritime economics.

203.7 Steamship Marketing — The practice of marketing for the shipping industry is varied and often unique. Students will study the elements of marketing, current market practices, and will prepare simulated contracts.

203.8 International Trade — Covers strategic characteristics of international trade. Although emphasis will be placed on Canada's major trading partners, this course will also cover foreign currency, international organizations, market forces, and multinational companies.

203.9 Marine Documentation — Import and export businesses are required to produce documentation for legal and Customs purposes. This course identifies the requirements for documentation in Canada, and in other countries. Students will research and complete the various documents commonly used.

204.1 Dangerous Goods and Marine Pollution — Covers the various cargoes classified as dangerous goods, and will investigate the special requirements for the handling, stowage, and documentation of dangerous goods. Students will also become familiar with the International Maritime Dangerous Goods Code, Canadian Dangerous Goods legislation, and the pollution acts with reference to cargoes.

204.2 Cargo Planning — Presents a technical course involving the planning of marine cargoes on terminals and aboard vessels. Students will acquire the knowledge of pre-voyage planning, cargo planning, ship's stability, shear forces, and bending moments.

205.3 Maritime Law II— Adopts a critical approach to the law of shipping, investigating the implications of maritime law, international law, and arbitration. Analysis is supported by case studies and legal analysis.

205.4 Marine Insurance II — The elements of marine insurance are applied to the daily practice of the industry. Students will enhance their studies through case studies and related field trips.

205.5 Law of the Carriage of Goods by Water — Students will undertake an in-depth study of the law, with an emphasis on how it is applied to Canadian transportation, and what implications this may have for Canadian Shipping.

Note: In general, the 300 series courses combine selected course content from the 100 and 200 series courses. For a more detailed description of the course, the reader should refer to the appropriate course identified. All 300 series courses require students to undertake extensive self study.

300.0 Industry Awareness — Students will be placed with a maritime related company to gain experience in the daily operations associated with the shipping industry. A written report is required from the student. Evaluation will also include a formal assessment from the host company.

301.1 General Ship Knowledge (Combines courses 101.1, 101.2, 104.1, and 204.1) — Includes the study of ocean vessels, the cargoes they may carry, and the limitations and regulations associated with ocean transportation.

301.2 Management & Marine Industrial Relations (Combines courses 101.4 and 102.4) — Combines the principles of management with the specific characteristics associated with the marine industry to enable students to study the economic impact of industrial relations.

301.3 Business of Shipping (Combines courses 101.3 , 103.4, 201.5, and 203.5) — Studies the business sectors of shipping with specific reference to vessel and cargo broking, and the economics of ship management and operation.

302.1 Port Administration & Management (Combines courses 102.1, 102.2, 203.7, and 203.9) — Emphasizes the role of the sea port in the operations of international trade. Students will study the various elements which constitute a port, and the process of port operation and management.

303.1 Business Studies (Combines courses 103.2, 103.3, 103.7, and 113.8) — This course (specifically designed for part-time students) groups together the basic mathematics, communication, and computer skills necessary for the business community. Due to the manner in which the content has been condensed, computers will be used throughout this course.

303.2 International Business and Trade — The content of courses 102.3 and 203.8 will be integrated with the study of international business. Students will be encouraged to investigate the subject from a practical viewpoint.

305.1 Maritime Law I and II — Combines courses 105.1 and 205.3.

305.2 Maritime Insurance I and II — Combines courses 105.2, and 205.4.

400.0 Diploma Project and Analysis — Students are required to submit a project proposal for study in a related area of interest. Upon project approval students will be assigned to a project advisor(s), and will be required to attend group study seminars. Three copies of the final project are to be submitted to the Chief Instructor at least four weeks prior to the end of the semester.

TRADES TRAINING

TRANSPORTATION TRAINING

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 32-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 colour 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 at (604) 434-3304.

Cooperative Education

This is a Cooperative Education program that 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 Co-op 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 on his/her own) to find a meaningful work experience. For more information see page 11.

The complete Cooperative Education policy including student, institute and employer responsibilities is available through the Cooperative Education Office and the Registrar's Office.

Co-op Coordinator: (604) 432-8291
General Enquiries: (604) 432-8634
The Cooperative Education Office is located in Building NE1.

Program Content

Core (Repair/Refinishing)

ABOD 1100 Autobody Repair/Refinishing Trade
ABOD 1101 Safe Work Practices
ABOD 1102 General Shop Practices
ABOD 1103 Welding
ABOD 1104 Rebuild Meth/Tech Shape Metals
ABOD 1105 Fitting Methods
ABOD 1106 Refinishing Techniques
ABOD 1990 Coop 1

Intermediate (Repair)

ABOD 2200 Welding Equipment
ABOD 2201 Autobody Construction
ABOD 2202 Electrical Systems
ABOD 2203 Cooling Systems
ABOD 2204 Air Conditioning
ABOD 2205 Plastics and Composites
ABOD 2206 Sheet Metal Repairs
ABOD 2207 Fitting Methods
ABOD 2208 Refinishing
ABOD 2990 Co-op 2

Intermediate (Refinishing)

ABOD 2209 Safe Work Practices
ABOD 2210 Plastics and Composites
ABOD 2211 Sheet Metal Repairs
ABOD 2212 Refinishing Equipment
ABOD 2213 Surface Conditions
ABOD 2214 Surface Preparation
ABOD 2215 Masking Materials
ABOD 2216 Undercoat Systems
ABOD 2217 Topcoat Systems
ABOD 2218 Selected Repairs
ABOD 2219 Predelivery
ABOD 2990 Coop 2

Specialization (Repair)

ABOD 3300 Safe Work Practices
ABOD 3301 Shop Management and Appraisal
ABOD 3302 Body Components and Replacement Panels
ABOD 3303 Shop Equipment
ABOD 3304 New Science of Unibody Repair
ABOD 3305 Selected Repairs
ABOD 3306 Trends in Technology

Specialization (Refinishing)

ABOD 3355 Safe Work Practices
ABOD 3356 Refinishing Equipment
ABOD 3357 Topcoat Systems
ABOD 3358 Selected Repairs
ABOD 3359 Preparation Systems
ABOD 3360 Shop Management and Appraisal
ABOD 3361 Trends in Technology

Program Length

Total length of the program is 87 weeks, full-time, which includes a 32-week work term.

Normal Course Hours

0700-1415, Monday through Friday (may vary).

Prerequisites

High school graduation or successful completion of the BCIT pretest 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 currently has agreements with a number of school districts throughout the province that 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 academic prerequisites (no pre-entry test), complete a related Career Preparation program, have good grades in Grade 12, and/or relevant work experience. For additional information see your high school counsellor, Technical Education teacher, or call BCIT Student Services at (604) 434-3304, or 1-800-667-0676 for enquiries from outside the Greater Vancouver area.

Instructors

Gordon Smith, Chief Instructor
Clarence Heppner
Harry Evans

TRADES TRAINING

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
There is a real need for the technician in the workplace today to have a thorough understanding of Electrical and Electronic component operation and diagnostics. The trade has further been complicated by the advent of strict emission enforcement, which means that a technician must continue to upgrade. Due to the ever increasing amount of technological changes that are taking place in vehicle design and function, along with the extensive use of electronics, the automotive repair industry has recognized that keep pace with the high level of sophistication that is present in today's automobile.

As electronics are now an integral part of almost all automobile subsystems, understanding them will go a long way in insuring a placement in today's competitive job market.

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
Automatic transmission electronics

Program Length
17 weeks, full-time.

Normal Course Hours
0700-1345, Monday through Friday.

Prerequisites
Apprentice with minimum 2 years in the trade;
or
Journeyed or T.Q. status (must provide licence number);
or
Successful completion of Automotive Mechanic program;
and
Pre-entry test (Math, English and Mechanical Assessment and Mechanical aptitude test) with all of the above.

Procedure
All interested persons must fill out an application form prior to being allowed to write the pretest. The Admissions department (ground floor, SW1 Building) will supply applicants with a form to take to the School of Trades Training Developmental Studies Centre (NE1 - Room 403) so that the Instructor knows that the applicant is eligible to write the exam. The Instructor will mark the exam and complete the results section of the form for return to the Admissions department. Information regarding the pre-entry test is available by calling (604) 451-6832.

Instructor
Norm Cloutier, 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.

Continued on page 272

TRADES TRAINING

Continued from page 271

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, and tune-ups, etc., or may 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 licence. 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

34 weeks, full-time. Students may receive credit for selected modules depending on previous training.

Normal Course Hours

0700-1345 (first shift); 1000-1645 (second shift), Monday through Friday. Shift will be assigned at orientation session.

Prerequisites

High school graduation with English 12 and Math 11 with C or better; or successful completion of a BCIT pre-entry test measuring math and reading skills. A valid driver's licence that is acceptable for use in B.C. is required.

BCIT currently has agreements with a number of school districts throughout the province that 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 academic prerequisites (no pre-entry test) and complete a related Career Preparation Program with good grades. For additional information see your high school counsellor, Technical Education teacher, or call BCIT Student Services at (604) 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.
Tony Lengert, T.Q., I.P. (GM Auto Group)
Rob MacGregor, I.D., T.Q., I.P.,
Chief Instructor (AST, AET Group)
Kelly McCutchon, T.Q.
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. (Toyota)
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. (Dawson Creek)
Gabor Retei, T.Q., I.P. (GM Auto Group)
Mel Rudeen, I.D., T.Q., I.P.
Sandy Sudom, I.D., T.Q., I.P., B.Ed.
Brian Taylor, I.Q., I.P. (Maple Ridge)
Mike Thomas, T.Q., I.P., I.D.
Tim Wood, T.Q., I.P. (Honda)

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 topnotch 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 $40,000 (or more) 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 co-op 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.

TRADES TRAINING

Program Content

Term 1

			credits	hrs
ASTP	1100	Math 1	2.5	39
ASTP	1101	Physics 1	2.5	39
ASTP	1102	Communications 1	2.5	39
ASTP	1103	Drafting	2.5	39
ASTP	1104	Shop Tools & Safety	2.5	38
ASTP	1105	Wheel Hubs & Tires	1.0	18
ASTP	1106	Frames & Suspension Systems	1.0	19
ASTP	1107	Steering	3.5	50
ASTP	1108	Brake Systems	3.5	52
ASTP	1109	Introduction to Electrical Systems	1.0	17
ASTP	1110	Clutches & Manual Transmissions	2.5	40
ASTP	1990	Co-op 1	26.0	390

Term 2

ASTP	2200	Math 2	2.5	39
ASTP	2201	Physics 2	2.5	39
ASTP	2202	Communications 2	2.5	39
ASTP	2203	Welding	3.0	48
ASTP	2204	Gasoline Engines	7.0	105
ASTP	2205	Diesel Engines	1.0	15
ASTP	2206	Drive Lines	1.0	15
ASTP	2207	Drive Axles & Final Drives	1.5	20
ASTP	2208	Automatic Transmissions	3.5	55
ASTP	2209	Transfer Cases	1.0	15
ASTP	2990	Co-op 2	26.0	390

Term 3

ASTP	3300	Computer Applications 1	2.5	39
ASTP	3301	Customer Relations & Sales	2.5	39
ASTP	3302	Fuel Management Systems	4.0	62
ASTP	3303	Auto Electronics	5.0	78
ASTP	3304	Electrical Fundamentals	2.0	25
ASTP	3305	Starting Systems	1.5	20
ASTP	3306	Charging Systems	1.5	25
ASTP	3307	Ignition Systems	2.0	30
ASTP	3308	Tune-up & Emissions	5.0	72
ASTP	3309	Air Conditioning	2.5	39
ASTP	3990	Co-op 3	13.0	390

Term 4 — Technician Specialty

			credits	hrs
ASTP	4410	Business Fundamentals	2.5	39
ASTP	4411	Advanced Computer Controls	3.5	52
ASTP	4412	Electronic Accessories	2.5	39
ASTP	4413	Alternate Fuels	2.5	39
ASTP	4414	Oil Fuel Chemistry	2.5	39
ASTP	4415	Advanced Fuel Management Systems	10	143
ASTP	4416	Accounting Essentials	2.5	39

Term 4 — Administration Specialty (available through Part-time Studies only)

ASTP	4400	Computer Applications 2	2.5	39
ASTP	4401	Canadian Economy	2.5	39
ASTP	4402	Business Resource Management	2.5	39
ASTP	4403	Marketing 1	2.5	39
ASTP	4404	Marketing 2	2.5	39
ASTP	4405	Communications 3	2.5	39
ASTP	4406	Transport Administration	10.5	156

Cooperative Education

This is a Cooperative Education program that 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 Co-op 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 on his/her own) to find a meaningful work experience. For more information see page 11. The complete Cooperative Education policy including student, institute and employer responsibilities is available through the Cooperative Education Office and the Registrar's Office.

Co-op Coordinator: (604) 432-8291
General Enquiries: (604) 432-8634
The Cooperative Education Office is located in Building NE1.

Program Length

Two years, full-time.

Normal Course Hours

0700-1530, Monday through Friday.

Prerequisites

High School graduation with Math 11 with C+ and English 12 with C or successful completion of the BCIT pretest. A valid driver's licence that is acceptable for use in B.C. is required. Applicants must also attend a personal interview with the department 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. (604) 434-3304.

BCIT currently has agreements with a number of school districts throughout the province that 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 academic prerequisites (no pre-entry test), 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 (604) 434-3304, or 1-800-667-0676 for enquiries from outside the Greater Vancouver area.

Instructors

Rob MacGregor, T.Q., I.D., I.P.,
Chief Instructor (AST, AET group)
Gary Remenyk, T.Q., I.P.
Mike Thomas, T.Q., I.D., I.P.

TRADES TRAINING

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, such as engine, 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 may seek employment as apprentices.

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. Students must have a valid driver's licence. 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 at (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 including pre-trip for air endorsement
Describe and service air operated controls and accessories

Program Length

30 weeks, full-time.

Normal Course Hours

0700-1345, Monday through Friday.

Prerequisite

High school graduation or successful completion of BCIT pretest.

BCIT currently has agreements with a number of school districts throughout the province that 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 academic prerequisites (no pre-entry test) and complete a related Career Preparation program with good grades. For additional information see your high school counsellor, Technical Education teacher, or call BCIT Student Services at (604) 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., Chief Instructor
Larry Strong, I.D., Auto. I.P., Com.Trans. Auto I.P.
Keith Whitter, I.D., Com. Trans T.Q., Auto I.P.

TRADES TRAINING

DIESEL ELECTRONICS
Certificate Program

The diesel engine electronic technician will work in one of three trades, diesel engine mechanics, commercial transport mechanics or heavy duty mechanics. Electronic fuel control is used on diesel engines used in all of these trades.

A diesel engine electronic technician must have the skills to diagnose and troubleshoot problems with electronic fuel systems on today's modern diesel engines as well as have a good understanding of other electronic systems used on trucks and equipment.

Job Opportunities
Graduates of this program will gain skills in diesel electronics that will assist them in seeking employment in the commercial transport mechanics, heavy duty mechanics and diesel engine mechanics industries.

The Program
Electrical and electronic theory along with hands-on use of diagnostic tools and troubleshooting manuals enable students to become competent in the repair, troubleshooting and diagnosis of electronic fuel systems for diesel engines.

Program Content
Electricity
Batteries, charging systems and starters
Fuel supply system
Electronic control overview
Harnesses and connectors
Electronics
Power train data link
Troubleshooting
Detroit Diesel Electronic Control (DDEC)
Caterpillar electronic control
Cummins Electronic Control (CELECT)
Other manufactures system

Program Length
10 weeks, full-time.

Normal Course Hours
0700-1345, Monday through Friday.

Prerequisites
Trade Qualifications (T.Q.) or Interprovincial (I.P.) in either Heavy Duty Mechanics, Commercial Transport Mechanics, or Diesel Mechanics
or
Commercial Transport Level III or Heavy Duty Level IV

Instructor
Keith Whitter, I.D., Comm. Trans. T.Q., Auto I.P.

DIESEL ENGINE MECHANIC
Certificate Program

The diesel engine mechanic repairs, maintains and rebuilds diesel engines that 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 may seek employment as apprentices.

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 at (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.

Prerequisite
High School graduation or successful completion of the BCIT pretest.

BCIT currently has agreements with a number of school districts throughout the province that 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 academic prerequisites (no pre-entry test) and complete a related Career Preparation program with good grades. For additional information see your high school counsellor, technical education teacher, or call BCIT Student Services at (604) 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.

TRADES TRAINING

HEAVY DUTY MECHANIC
Certificate Program

The heavy duty mechanic repairs and tests heavy duty machines, such as 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.

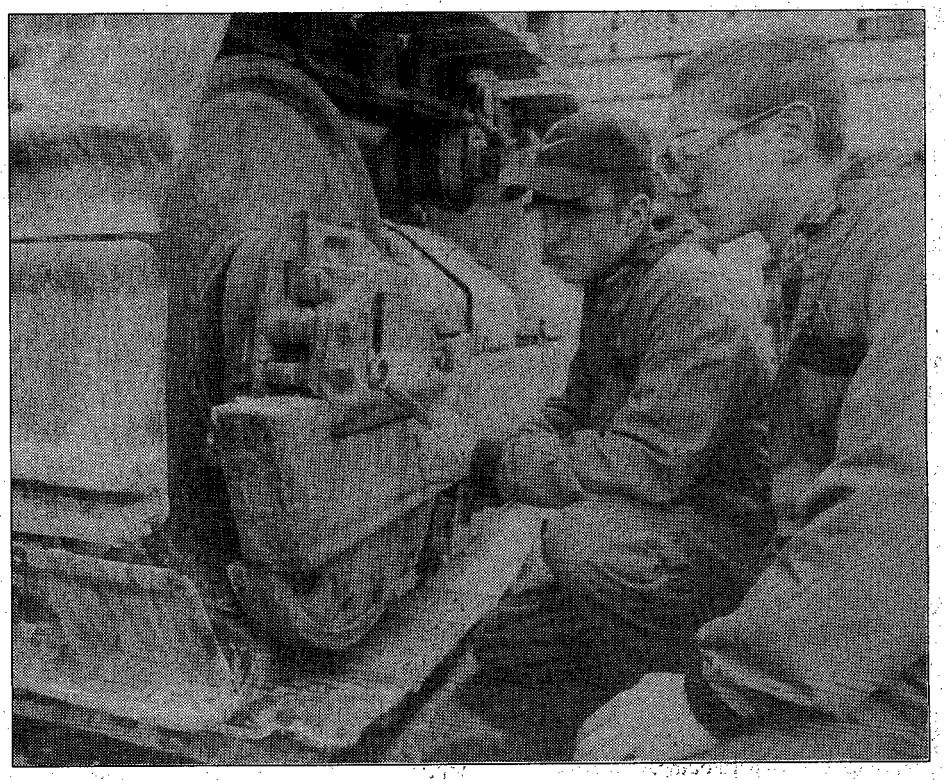
Job Opportunities

Training prepares students for entry-level employment as heavy duty mechanics. Upon successful completion of the program, students may seek employment as apprentices. 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 should have a valid driver's licence. 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.

Prerequisite

High School graduation or successful completion of the BCIT pretest.

BCIT currently has agreements with a number of school districts throughout the province that 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 academic prerequisites (no pre-entry test) and complete a related Career Preparation program with good grades. For additional information see your high school counsellor, Technical Education teacher, or call BCIT Student Services at (604) 434-3304, or 1-800-667-0676 for enquiries from outside the Greater Vancouver area.

Instructors

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 may seek employment as apprentices. 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 tradespersons 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 at (604) 434-3304.

Program Content
CORE 1100 Use Safe Work Practices
CORE 1101 Solve Mathematical Problems
CORE 1102 Apply Science Concepts
CORE 1103 Use Hand and Shop Tools
CORE 1104 Use Fasteners and Fittings
CORE 1105 Use Resources Related to the Trade
CORE 1106 Service Internal Combustion Engines
CORE 1107 Apply Principles of Lubrication
CORE 1108 Perform Welding, Cutting and Brazing
CORE 1109 Basic Electrical Systems
IOMX 1110 Engines & Support Systems
IOMX 1111 Seal Gasket/Bearing Design Service
IOMX 1112 Lift Loads
IOMX 1113 Service Outboard Engines
IOMX 1114 Service Inboard Engines
IOMX 1115 Engine Support Systems
IOMX 1116 Principles of Electricity
IOMX 1117 Marine Electrical Systems
IOMX 1118 Inboard/Outboard Power Systems
IOMX 1119 Remote Control Systems
IOMX 1120 Tilt and Trim Systems
IOMX 1121 Tune-ups and Rebuilds

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.

Prerequisite
High School graduation or successful completion of the BCIT pretest.

BCIT currently has agreements with a number of school districts throughout the province that 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 academic prerequisites (no pre-entry test) and complete a related Career Preparation program with good grades. For additional information see your high school counsellor, technical education teacher, or call BCIT Student Services at (604) 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., I.D.

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.

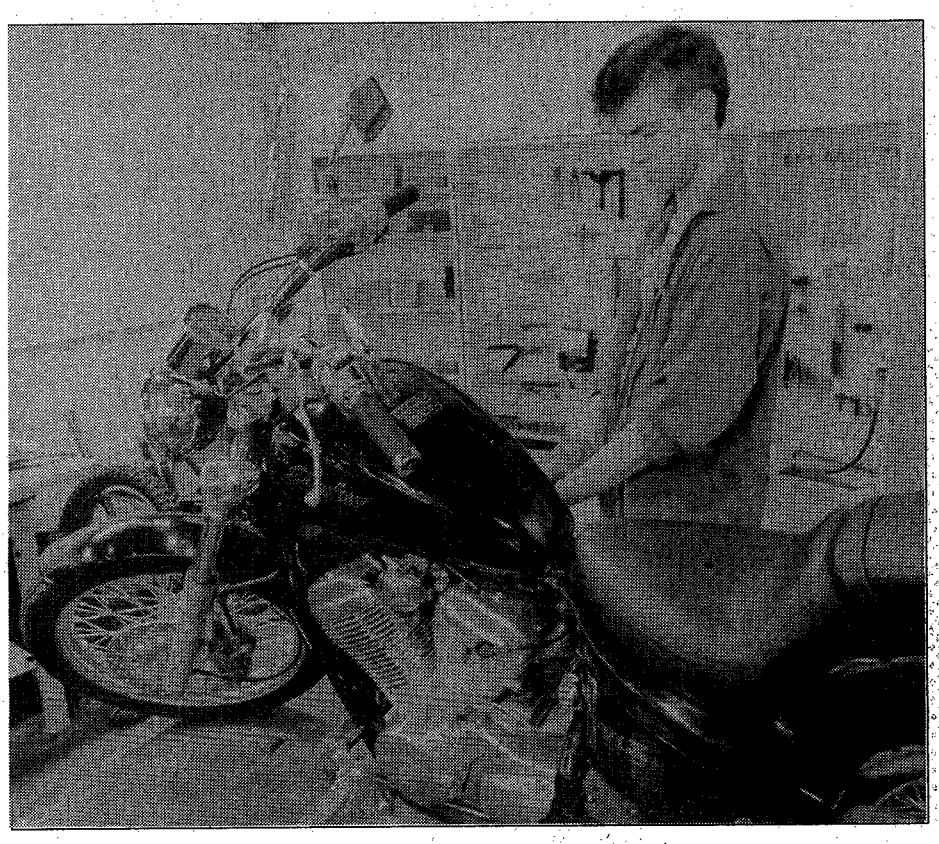
Job Opportunities
Training prepares students for entry-level employment as motorcycle mechanics.

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 may seek employment as apprentices.

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 at (604) 434-3304.

Continued on page 278



POWER EQUIPMENT MECHANIC

Certificate Program

Power Equipment Mechanics must be very versatile due to the wide variety of equipment they must service. Typical equipment serviced or repaired by Power Equipment Mechanics include: compressors, water pumps, chainsaws, ATV's, snowmobiles, watercraft, and lawn and garden equipment. Power Equipment Mechanics are involved in all aspects of equipment service including new unit preparation to complete rebuilding of equipment.

Job Opportunities

Successful completion of this program prepares students for entry-level employment as a power equipment mechanic.

Training prepares students for entry-level employment in retail outlets, service centres, equipment rental shops, or become self employed. Job opportunities are available throughout the Province. Mechanics with experience in a wide variety of equipment are always in demand.

The Program

Basic theory and related information along with hands-on shop practice will enable students to become competent to work in the power equipment 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 at (604) 434-3304.

Program Content

CORE 1100 Use Safe Work Practices
CORE 1101 Solve Mathematical Problems
CORE 1102 Apply Science Concepts
CORE 1103 Use Hand and Shop Tools
CORE 1104 Use Fasteners and Fittings
CORE 1105 Use Resources Related to the Trade
CORE 1106 Service Internal Combustion Engines
CORE 1107 Apply Principles of Lubrication
CORE 1108 Perform Welding, Cutting and Brazing
CORE 1109 Basic Electrical Systems
MCMX 1110 Service Proc Engines/Support Systems
MCMX 1111 Seal Gasket/Bearing Design Service
MCMX 1112 Two and Four Cycle Top End Service
MCMX 1113 Lubrication/Cooling Systems
MCMX 1114 Service Power Transmissions
MCMX 1115 Basic Electrical Operations
MCMX 1116 Service Electrical Systems
MCMX 1117 Service Fuel Delivery Systems
MCMX 1118 Describe Final Drive Service
MCMX 1119 Service Brake Systems
MCMX 1120 Service Wheels and Tires

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.

Prerequisite

High School graduation or successful completion of the BCIT pretest.

BCIT currently has agreements with a number of school districts throughout the province that 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 academic prerequisites (no pre-entry test) and complete a related Career Preparation program with good grades. For additional information see your high school counsellor, technical education teacher, or call BCIT Student Services at (604) 434-3304, or 1-800-667-0676 for enquiries from outside the Greater Vancouver area.

Instructor

Tom Nelson, Dipl. Tech., T.Q.,
Chief Instructor

TRADES TRAINING

Program Content

CORE 1100 Use Safe Practices
CORE 1101 Solve Mathematical Problems
CORE 1102 Apply Science Concepts
CORE 1103 Use Hand and Shop Tools
CORE 1104 Use Fasteners and Fittings
CORE 1105 Use Resources Related to the Trade
CORE 1106 Service Internal Combustion Engines
CORE 1107 Apply Principles of Lubrication
CORE 1108 Perform Welding, Cutting and Brazing
CORE 1109 Basic Electrical Systems
PEMX 1110 Service Four Stroke Engines
PEMX 1111 Service Two Stroke Engines
PEMX 1112 Maintain and Repair Fuel Systems
PEMX 1113 Maintain and Repair Cooling Systems
PEMX 1114 Repair Electrical Systems
PEMX 1115 Repair Charging Systems, Electrical Motors
PEMX 1116 Repair Power Transfer Systems
PEMX 1117 Repair Chassis and Brake Systems
PEMX 1118 Selected Service Procedures
PEMX 1119 Complete a Work Placement

Program Length

34 weeks, full-time.

Normal Course Hours

0700-1400, Monday through Friday.

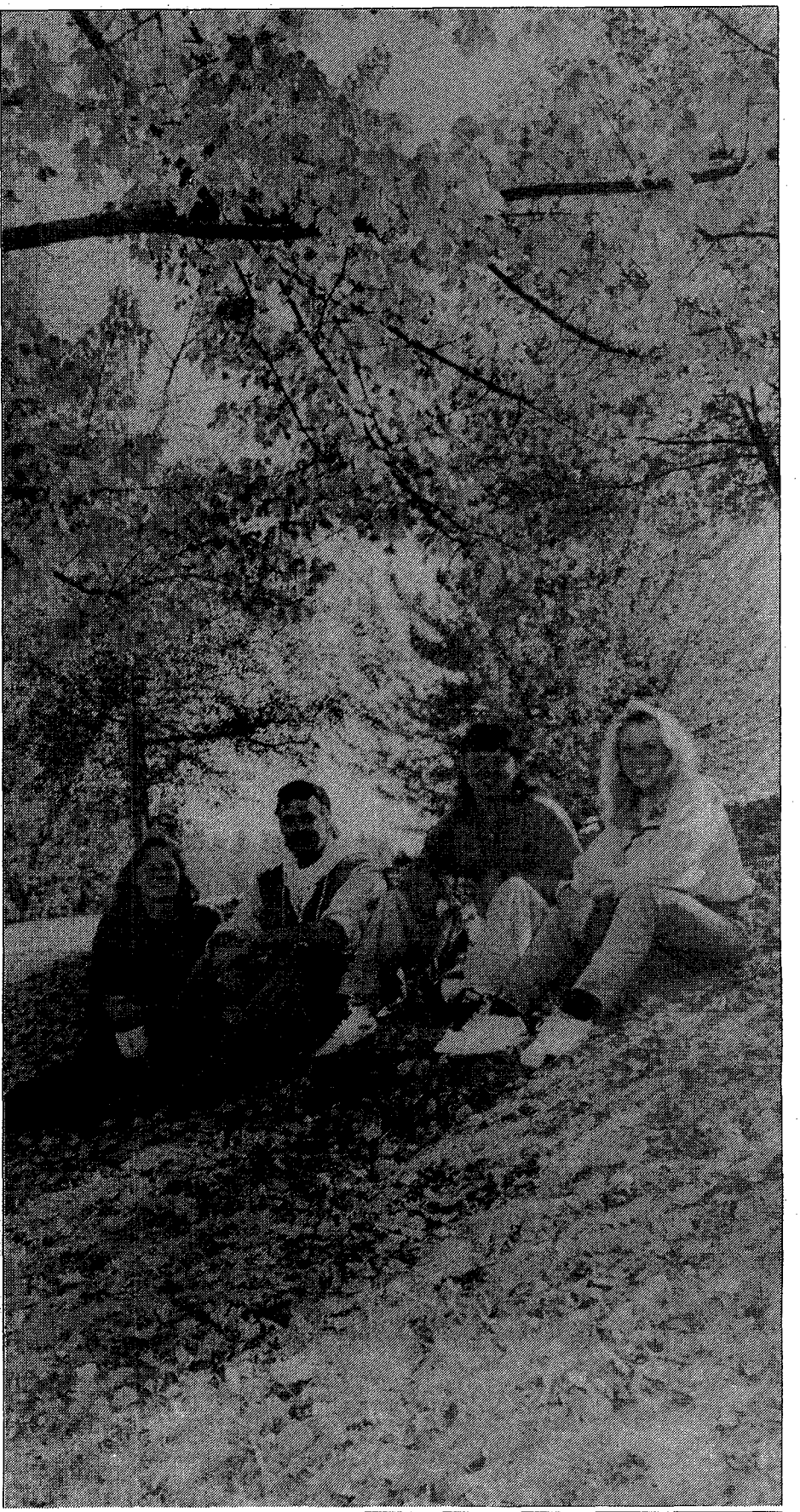
Prerequisites

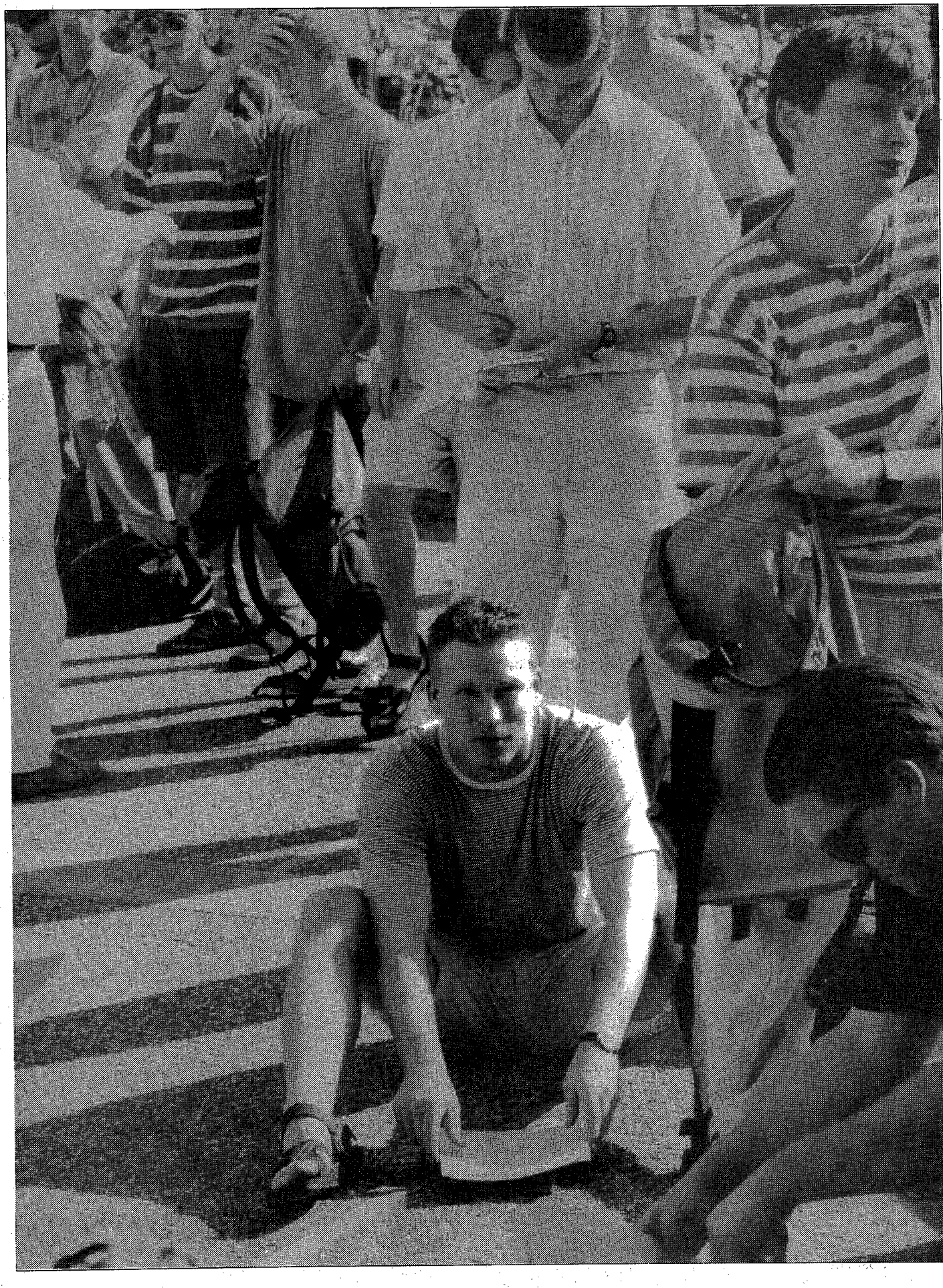
High School graduation or successful completion of BCIT pretest.

BCIT currently has agreements with a number of School Districts throughout the Province that gives 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 academic prerequisite (no pre-entry test) and complete a related Career Preparation program with good grades. For additional information see your counsellor, technology education teacher, or call BCIT Student Services at (604) 434-3304 or 1-800-667-0676 for enquiries from outside the Greater Vancouver area.

Instructor

Bob Miller, Dipl. Tech., T.Q.





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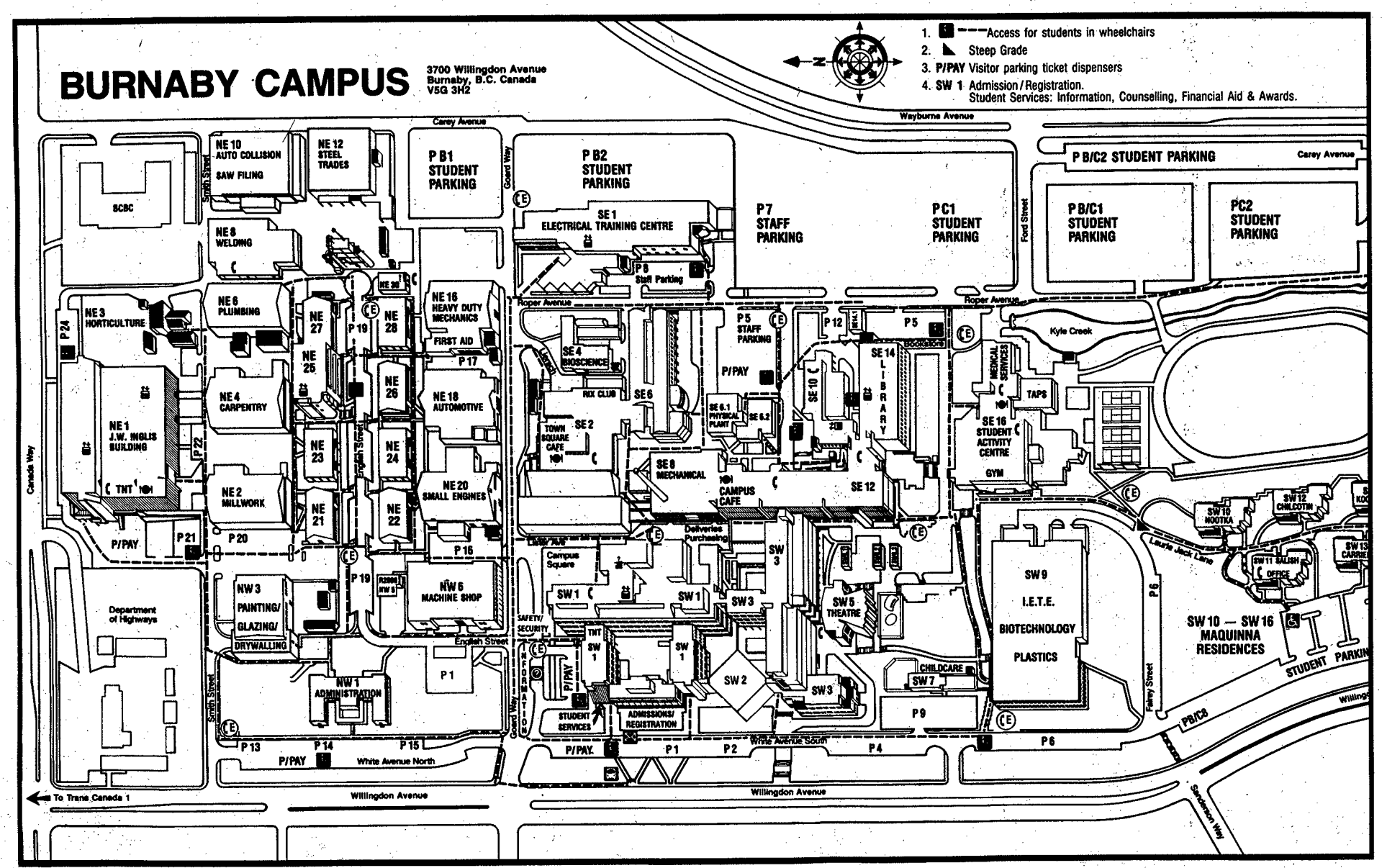
BURNABY CAMPUS
3700 Willingdon Avenue
Burnaby, B.C. Canada
V5G 3H2
1. Access for students in wheelchairs
2. Steep Grade
3. P/PAY Visitor parking ticket dispensers
4. SW 1 Admission / Registration.
Student Services: Information, Counselling, Financial Aid & Awards.
Carey Avenue
Wayburne Avenue
Roper Avenue
Willingdon Avenue
White Avenue North
White Avenue South
English Street
Smith Street
Canada Way
Gaard Way
Ford Street
Fairey Street
Laurie Jack Lane
Sandallson Way
To Trans Canada 1
SCBC
NE 10 AUTO COLLISION SAW FILING
NE 12 STEEL TRADES
NE 8 WELDING
NE 6 PLUMBING
NE 3 HORTICULTURE
NE 4 CARPENTRY
NE 1 J.W. INGLIS BUILDING
NE 2 MILLWORK
NE 27
NE 25
NE 23
NE 21
NE 28
NE 26
NE 24
NE 22
NE 16 HEAVY DUTY MECHANICS
FIRST AID
NE 18 AUTOMOTIVE
NE 20 SMALL ENGINES
NW 3 PAINTING/ GLAZING/ DRYWALLING
NW 6 MACHINE SHOP
NW 1 ADMINISTRATION
Department of Highways
P B1 STUDENT PARKING
P B2 STUDENT PARKING
SE 1 ELECTRICAL TRAINING CENTRE
P8 Staff Parking
P7 STAFF PARKING
PC1 STUDENT PARKING
P B/C1 STUDENT PARKING
PC2 STUDENT PARKING
P B/C2 STUDENT PARKING
P5 STAFF PARKING
P/PAY
SE 4 BIOSCIENCE
RIX CLUB
SE 6
SE 2 TOWN SQUARE CAFE
SE 8 MECHANICAL
CAMPUS CAFE
SE 6.1 PHYSICAL PLANT
SE 6.2
SE 10
SE 14 LIBRARY
SE 12
SE 16 STUDENT ACTIVITY CENTRE
GYM
MEDICAL SERVICES
TAPS
Kyle Creek
Campus Square
Deliveries Purchasing
SW 1
SW 3
SW 5 THEATRE
SW 9 I.E.T.E. BIOTECHNOLOGY PLASTICS
CHILDCARE
SW 7
SW 2
SAFETY/ SECURITY
INFORMATION
STUDENT SERVICES
ADMISSIONS/ REGISTRATION
SW 10 NOOTKA
SW 12 CHILCOTIN
SW 11 SALISH
OFFICE
SW 13 CARRIER
SW 10 — SW 16 MAQUINNA RESIDENCES
STUDENT PARKING
P1
P2
P4
P6
P9
P13
P14
P15
P16
P17
P19
P20
P21
P22
P24
PB/C5

Application for Admission

FULL-TIME PROGRAMS

1 When to Apply

Trades/Vocational Programs: Applications are accepted all year round.

Technology Programs:

Apply After:	*For Term Starting:*
October 1	August/September
June 1	January
January of the previous year	January: Medical Radiography
September 1	May: Engineering Technology Entry

2 How to Apply

1 Complete the attached admission application form making sure to complete every item.

2 You **must** submit transcripts of your secondary school marks and any post-secondary institutions you have attended. ***If you do not have official transcripts, you must attach photocopies so that processing can begin.***

3 Check the BCIT Full-time Calendar or program brochure to ensure you have included any additional entrance requirements for your desired program. These additional requirements are listed in the prerequisites section of the program brochure or calendar. Contact BCIT Student Services at (604) 434-3304 for program brochures and program information.

4 Attach a non-refundable application fee of $15. Please pay by cheque, money order, VISA or MasterCard. You can also pay by cash in person but do not send cash through the postal system. A service charge for any NSF or returned cheque will be assessed.

5 Mail this application together with your supporting documents to: **BCIT Admissions Department, 3700 Willingdon Avenue, Burnaby, B.C. V5G 3H2.** You may also drop off your application in person at the Cashier's Wicket in the SW1 Building which faces Willingdon Avenue.

6 You will receive a letter confirming receipt of your application within **4 *weeks*** of your application date. If you have any questions regarding your application, please call BCIT's Admissions Department at (604) 432-8419.

3 Important Notes

☞ Official transcripts and documents submitted are the property of BCIT and are not returned or photocopied for applicants.

☞ Irreplaceable documents, e.g. out of country transcripts, will be returned at the time of application only if the Admissions Department receives a written request and a self-addressed envelope.

☞ Applicants who are not accepted or do not register when classes begin, must reapply for future start dates. All supporting documents, including transcripts, must be resubmitted.

☞ Complete applications (which include all supporting documents) will be considered on a first come, first served basis. However, many programs receive more applications than seats available. In these programs, BCIT will select those applicants deemed to have the best opportunity for success.

TRANSCRIPT INFORMATION
please read carefully

1. When submitting your application form, you must include your transcript(s) showing secondary and post-secondary grades.
2. You must submit a photocopy of a transcript if you do not have an official transcript available. This will allow the processing of your application to begin.
3. If you submit a photocopied transcript, BCIT reserves the right to request an official transcript at any time.
4. For a transcript to be considered official, it must bear the original signature, seal, or stamp of the issuing institution.

Special note to students currently attending secondary school:

If you are currently attending Secondary School (High School), ask your Principal's Office to provide you with your marks for courses you have completed, interim marks for courses you are presently attending, and a list of courses you plan to take in the future. Arrange to have your final official transcript sent directly to BCIT upon completion.

Special note to those completing prerequisites through upgrading courses:

If you are attending or planning to attend courses that are required prerequisites for your desired BCIT program, you must include proof of registration with your application form. It is ***essential*** that you keep the Admissions Department informed of your progress by sending interim transcripts or an official note from the course instructor. Upon completion of the course(s), arrange to have your official transcript(s) sent to the Admissions Department at BCIT.

STOP

Make sure you complete this checklist before you hand in your application!

- ☐ Have you included either official or photocopied transcripts with your application?

If answered NO to the question above, don't hand in your application as processing cannot begin until transcripts are received.

- ☐ Have you included official proof of citizenship status if you are a Landed Immigrant/Permanent Resident or anything other than a Canadian Citizen?
- ☐ Have you included proof of registration or interim marks if you are taking upgrading courses?
- ☐ Have you included your $15 application fee?
- ☐ Have you included any additional program requirements as indicated in the BCIT program brochure or calendar?

STOP

BCIT Admissions Department
3700 Willingdon Avenue
Burnaby, B.C.
V5G 3H2

Application for Full-time Programs

BCIT Admissions Department: 3700 Willingdon Avenue Burnaby, B.C. V5G 3H2
Telephone: (604) 432-8419

PERSONAL DATA

BCIT STUDENT NUMBER

If you have previously been a BCIT student or have contacted BCIT for program information, a student number may already have been issued to you. You would find this number at the bottom of any correspondence from Student Services or the Registrar's Office.

If known, please enter that number here ⇨

If this number is not known, please check this box and a number will be assigned to you. ☐

To avoid duplication of our records, please enter your sex and birthdate in the spaces provided below.

Birthdate: _____ (day - month - year) Sex: ☐ male ☐ female

SOCIAL INSURANCE NUMBER (For tax purposes only)

Last Name (Family Name)

Legal First Name

Preferred First Name

Middle Name

Previous Last Name (e.g. Maiden Name)

Street/Box No.

Town/City Home Phone (___)___-____

Province Country Work Phone (___)___-____

Postal Code

All official BCIT correspondence will be mailed to this address. Please notify the Admissions Department of any change.

Your citizenship status is: ☐ Landed Immigrant/Permanent Resident

☐ Canadian Citizen ☐ Other (please specify): _____

Country of Citizenship if not Canada: _____

Do you wish to declare yourself as being of First Nations ancestory? ☐ yes ☐ no

If yes, do you wish to receive information on services available to First Nations students? ☐ yes ☐ no

B.C. Examination or PEN number (Personal Education Number) if known _____

Do you have any medical, physical or learning disability that you might require support services for?

☐ yes ☐ no If yes, please describe: _____

If yes, have you contacted Services for Students with Disabilities (434-3304)? ☐ yes ☐ no

If yes, have you contacted the Program Head/Chief Instructor of your desired program? ☐ yes ☐ no

Do you have any colour blindness? ☐ yes ☐ no

Who should be contacted in case of an emergency?

Last Name _____ First Name _____

Relationship to you _____ Phone Number (___)___-____

HISTORY

Last Secondary School attended	From:	To:	Grade completed	
Post Secondary School(s) attended	**From:**	**To:**	**Years completed**	**Credential earned**
Most recent employers (Attach resume if required or desired)	**From:**	**To:**	**Job title or duties performed**	

Have you been a resident of B.C. for the last 12 months? ☐ yes ☐ no

If no, please explain: _____

PROGRAM

For Trades/Vocational programs, please make only one choice. For Technology programs you can make one or two choices. If Engineering Technology Entry program (ETE) is your first choice, you must indicate the program you desire to take afterwards as your second choice.

Type of BCIT program desired: ☐ **TECHNOLOGY** ☐ **TRADE/VOCATIONAL**

1st Choice:
Program Name _____

* Option Name _____

2nd Choice:
Program Name _____

* Option Name _____

**** If you are applying to Marketing Management, Broadcast Communications, Renewable Resources or Trades Drafting you must indicate your option/specialization at the time of application.***

Preferred start date: _____ (month) (year)

For entrance into Level (please circle) 1 2 3 4 (Year 1 / Year 2)

Have you previously attended BCIT? ☐ yes ☐ no

Most students begin at level 1. Students seeking advanced placement because of previous education can apply for level 2 or higher. More information can be found in BCIT's Full-time Calendar or by calling Student Services at 434-3304.

LEGAL

I hereby declare that the information I have submitted on this application is true and correct. Completion of this signed application permits BCIT to request and/or confirm any information necessary to support my application for admission. In signing this application for admission I understand that this information, along with subsequent information placed on my student record will be protected and used in compliance with the Freedom of Information and the Protection of Privacy Act (S.B.C. 1992, c. 61 as amended by S.B.C. 1993, c.46) and the operations of BCIT. Information collected and maintained for Student Records is collected under the authority of the Institute of Technology Act, R.S.B.C. 1979, c.199, as amended by the Institute of Technology Act 1994. BCIT gathers and maintains information used for the purposes of admission, registration and other fundamental activities related to being a member of the BCIT community and attending a public post-secondary institution in the Province of British Columbia. Information you provide will also be used for research purposes. This research will include longitudinal research using anonymous linked records in the BC Educational Records Linkage File (Link File). The personal records in the Link File are not identifiable and are not used for administrative purposes. The purpose of the File is to gauge equity of access for students entering post-secondary institutions. For further information please contact the Office of the Registrar at 3700 Willingdon Avenue, Burnaby, B.C. V5G 3H2, phone (604) 432-8848.

Signature _____ Date _____

FEES

A non-refundable $15 application fee MUST be submitted with this form. You can pay by cheque, money order, VISA or MasterCard. Cash is accepted in person only. A service charge for any NSF or returned cheques will be assessed. ***Applications received without the $15 fee will not be processed.***

☐ Visa Card Number _____ Expiry Date _____

☐ MasterCard Number _____ Expiry Date _____

☐ personal cheque enclosed ☐ money order enclosed

Application for Full-time Programs

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If known, please enter that number here ⇨ |_|_|_|_|_|_|_|_|_|

If this number is not known, please check this box and a number will be assigned to you. ☐

To avoid duplication of our records, please enter your sex and birthdate in the spaces provided below.

Birthdate: _____ (day - month - year) Sex: ☐ male ☐ female

SOCIAL INSURANCE NUMBER (For tax purposes only) |_|_|_|_|_|_|_|_|_|

Last Name (Family Name) |_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|

Legal First Name |_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|

Preferred First Name |_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|

Middle Name |_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|

Previous Last Name (e.g. Maiden Name) |_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|

Street/Box No. |_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|

Town/City |_|_|_|_|_|_|_|_|_|_|_|_|_|_|_| Home Phone (___)|_|_|_|-|_|_|_|_|

Province |_|_|_| Country |_|_|_|_|_|_|_|_| Work Phone (___)|_|_|_|-|_|_|_|_|

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Have you previously attended BCIT? ☐ yes ☐ no

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☐ personal cheque enclosed ☐ money order enclosed

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