

# FULL-TIME PROGRAMS 2000

1999 - 2000

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for our grads  
by name



BRITISH COLUMBIA INSTITUTE OF TECHNOLOGY

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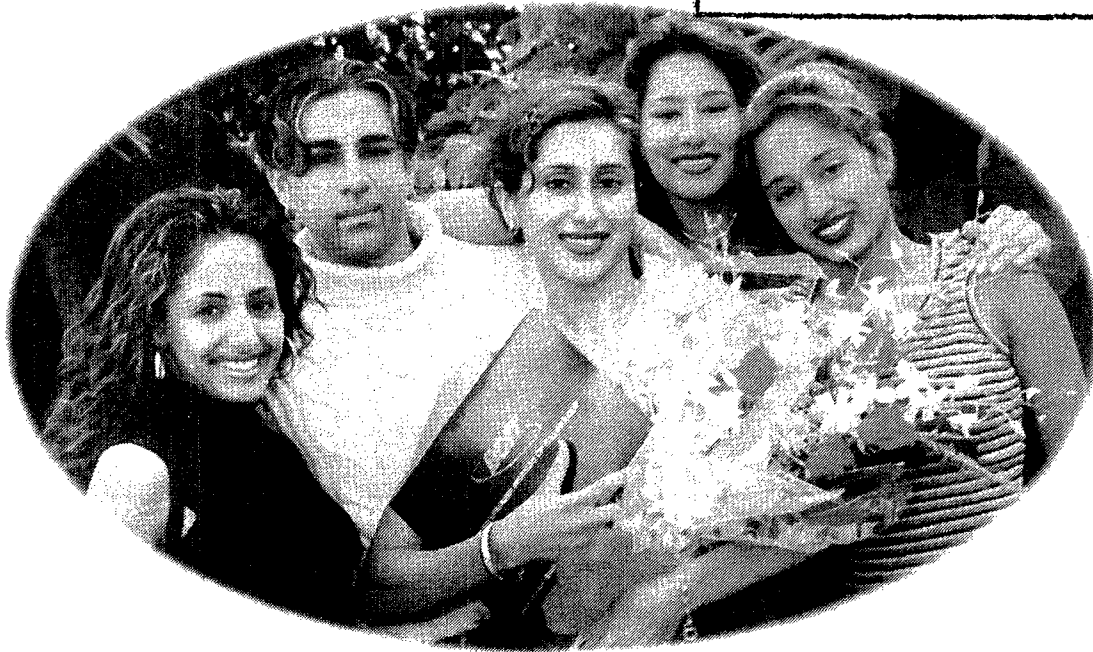


# The BCIT Mandate

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.

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## The BCIT Mission

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

*The World Wide Web ([www.bcit.bc.ca](http://www.bcit.bc.ca)) version is the up-to-date, official Academic Calendar*

LIBRARY  
B.C. INSTITUTE OF TECHNOLOGY  
3700 WILLINGDON AVE.  
BURNABY, B.C.  
V5G 2A6

## Changes to Curricula, Regulations and Services

BCIT is presently undergoing a number of program revisions to better serve our students with an increased focus on programs.

Although every effort is made to ensure that the contents of this calendar are accurate at the time of publication, BCIT 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.

This calendar is published for information purposes only. The calendar is not intended to be a complete statement of all procedures, policies, rules and regulations, nor is it to be construed as an irrevocable contract between the student and the Institute.

For the most up-to-date curricula please visit BCIT's Web site at [www.bcit.bc.ca](http://www.bcit.bc.ca).

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## They Ask for Our Grads by Name

Smart companies today want people with the job-ready skills BCIT provides.

Smart companies today ask for our grads by name.

Just check the career section in local newspapers — many companies specifically ask for BCIT credentials in their recruitment ads.

That's the kind of real-life support for BCIT that couldn't be passed up. Now the slogan "They ask for our grads by name" has become the marketing message for BCIT's diplomas and certificates.

It's a slogan that goes right to the heart of BCIT's mission and provincial mandate. It reinforces the reputation and credibility of BCIT's job-ready programs to employers, students and parents.

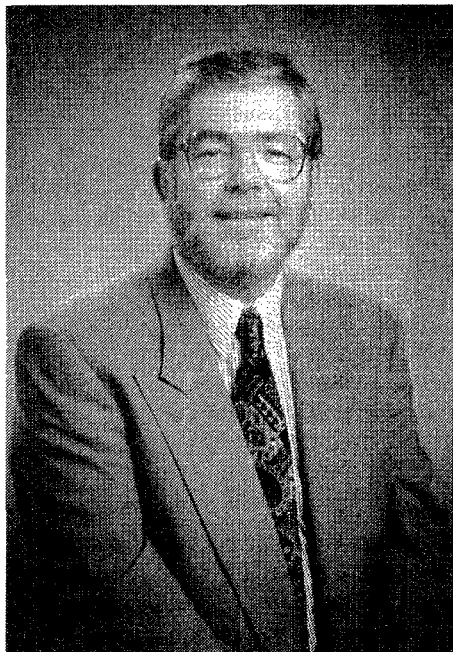


We're proud of our programs, our graduates and our reputation in industry. BCIT has worked hard to ensure it is delivering the kind of job-relevant training companies want for their employees. That's why they ask for our grads by name.

— from BCIT Marketing and Public Affairs

*They ask for our grads by name*

# Message from the President



It's my pleasure to welcome you, on behalf of the faculty and staff, to the BCIT community.

BCIT is a place to make lifelong friends and industry contacts, a place for both personal and professional growth. During your time here you'll work hard and upon graduation, you'll see industry confirm that your training was worthwhile.

Our mission is to provide British Columbians with world-class, job-ready skills for career success. The investment you are making in pursuing post-secondary education and training also contributes to a strong, healthy economy for all British Columbians.

We wish you all the best with the challenges you face, whether in the classroom or on the job.

A handwritten signature in black ink, reading "Brian Gillespie".

Brian Gillespie  
President

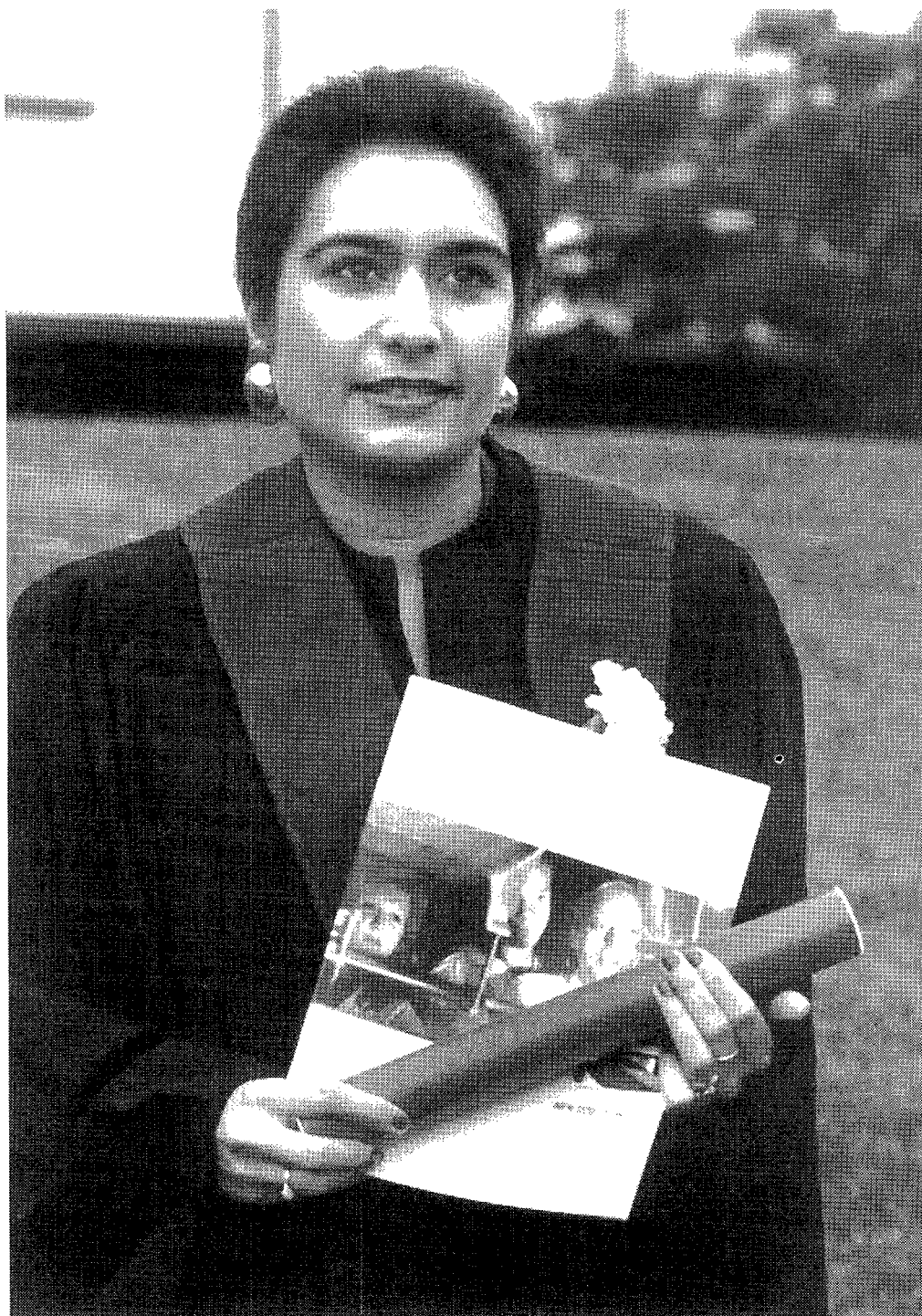


## The Coat of Arms

*BCIT's Coat of Arms was granted in the fall of 1996 and celebrates the Institute's degree-granting status. In designing the new Coat of Arms, the objective was to reflect the Institute's unique and highly valued characteristics.*

*The Coat of Arms is intended for use on diplomas, honorary awards, degrees and other awards of distinction.*

*BCIT's Coat of Arms bears the motto "To each their highest attainment".*



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## Class Locations/Office Hours

### 1. Burnaby, Main Campus

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

#### Full-time and Part-time courses and programs

Admission, Full-time programs: (604) 432-8419  
Application Forms/Program Information: (604) 434-1610  
Registration, Part-time: (604) 434-1610  
Registration, Fax: (604) 687-2488 or (604) 430-1331  
Student Records (604) 432-8498  
Student Records, Fax (604) 431-0817  
Refunds: (604) 432-8212  
Payments: (604) 432-8732

Office Hours — Burnaby campus  
Admissions/General Enquiries for Full-time Studies  
Monday to Friday 0830 - 1630  
Saturday Closed

**Please Note: Office Hours are currently under review and may be subject to change**

#### Registration and Information — General Inquiries for Full and Part-time Studies

*August 16, 1999 to April 29, 2000*

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

*May 1, 2000 to August 12, 2000*

Monday to Friday 0830-1300  
1400-1630  
Saturday Closed

**Please Note: Office hours are currently under review and may be subject to change.**

### 2. Downtown Campus (DTC)

(604) 412-7777 Fax: (604) 687-2488  
555 Seymour Street  
Vancouver, B.C. V6B 3H6

#### Office Hours

When school is in session:  
Monday to Thursday 0830-1800  
Friday 0830-1630

#### Summer Hours:

Monday to Thursday 0830-1730  
Hours subject to change.

### 3. Sea Island campus

(604) 278-4831 Aviation Programs  
(604) 278-0583 Electronics Programs  
(604) 278-2693 Stores Department  
(604) 278-4538 PTS/Industry Services  
(604) 278-3519 Library  
Fax: (604) 278-5363  
Vancouver International Airport South  
200 - 5301 Airport Road  
Richmond, B.C. V7B 1B5

### 4. Pacific Marine Training Campus

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

## Satellite campuses

### 1. Langley Senior Secondary

(604) 432-8216  
21405-56th Avenue  
Langley, B.C. V2Y 2N1

### 2. New Westminster Secondary

(604) 434-1610  
835-8th Street  
New Westminster, B.C. V3M 3S9

### 3. Maple Ridge Senior Secondary

(604) 463-8794  
21911-122nd Avenue  
Maple Ridge, B.C. V2X 3X2

### 4. Dawson Creek

(604) 432-8543  
School District 59  
Peace River South  
929-106 Avenue  
Dawson Creek, B.C. V1G 2N9

### 5. Thomas Haney Centre

(604) 434-1610  
2300-116th Avenue  
Maple Ridge, B.C. V2X 0T8

### 6. Sir Charles Tupper Secondary School

(604) 434-1610  
419 East 24th Avenue  
Vancouver, B.C. V5V 2A2

### 7. Tamanawis Senior Secondary

12600-60th Avenue  
Surrey, B.C. V3W 2A8  
(Registration takes place at the Newton Continuing Education Centre, Princess Margaret Senior Secondary  
(604) 501-1759, 12870-72nd Avenue, Surrey, B.C. V3W 2M9)

8. ANO Office Automation  
(604) 871-9521  
380 West 2nd Avenue  
Vancouver, B.C. V5Y 1C8

## The 24-Hour Clock

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

SAVINGS ON TRANSIT ALL DAY, ANY DAY

# FastTrax

ALL-ZONE TRAVEL FOR PUBLIC POST-SECONDARY STUDENTS



### FastTrax Makes the Grade

Using FastTrax on BC Transit's buses, SkyTrain and SeaBus makes travel to and from BCIT fast, easy and affordable. Best of all, there's no parking to consider. Many campus bound routes are also wheelchair lift-equipped. And each time you use public transit, you are helping to preserve our environment.

### FastTrax - The Smart Choice

The FastTrax strip is available to full-time students attending (qualified) post-secondary institutions in the Lower Mainland. Simply pick up the FastTrax strip at your student association office and attach it to your student ID card. You will be charged a \$2.00 fee by BCIT for the FastTrax strip. **When combined with your One Zone monthly FareCard**, the FastTrax strip allows you to travel all day, any day, throughout BC Transit's system (one, two or three zones) for the price of One Zone fare travel. Remember to always carry your One Zone monthly FareCard and your student ID card, with attached FastTrax strip.

### Information at Your Fingertips

- Bus numbers are listed on the bus stops at the College.
- Free timetables are available at the student association and many other campus locations.
- Call Talking Yellow Pages at 299-9000, local 2233 for pre-recorded transit information.
- Call BC Transit Customer Information: 521-0400 or West Vancouver 985-7777.
- Tickets and monthly passes are available at FareDealer outlets throughout the Lower Mainland.

*This program is currently under review and changes will be considered by the Transit Commission in September 1998.*

Schedules now on-line: [www.bctransit.com](http://www.bctransit.com)

**BC Transit**  Vancouver Regional  
Transit System  
[www.bctransit.com](http://www.bctransit.com)

## 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 at the Downtown campus.

## Refund Deadline

It is the student's responsibility to check the refund deadline dates in this calendar. Please see refund section on page 26. 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.

## 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, color, 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.

## Sexual 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 any benefit or 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. For more information please see the "Services" section of this calendar.

## BCIT Policy on Abusive or Threatening Behavior

### 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 behavior from anyone.

### Policy

BCIT will not tolerate violent, intimidating or abusive behavior 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.



## BCIT Policy on 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.

*continued next page*

### FOR STUDENTS ONLY

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**THE GLOBE AND MAIL**

## BCIT Policy on Conduct and Attendance cont.

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 "unexcused absence" for that day.
2. Prolonged illness of three or more consecutive days must have a doctor's certificate sent to the program head or chief instructor substantiating the absence. Failure to provide a certificate will result in these absences being unexcused.

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

### Trade Programs

1. Students who fail to report absences of three or more days to departments.
2. Students who are absent for any cause, for more than 10 per cent 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 per cent 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

For more details on appeal procedures, please contact the Registrar's Office at (604) 432-8848. Also see section on Reassessment of Academic Standing this calendar page 21.

## 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 that identifies a user to a computer; that is, knowledge of a password 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 persons are responsible for that password.)
- b) Do not attempt to read or copy any information stored on the computer system unless explicitly authorized to do so. This includes information which has been stored by Computer Resources, by other computer users, by a commercial vendor or by any other party.
- c) Do not use institute computer facilities for non-institutional projects, or for personal or commercial purposes, unless written authorization has been received from the Information and Computing committee.
- d) Do not move any computing equipment, and be extremely careful to avoid damage.

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

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

## Board of Governors

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Jim Mitchell, Director, Student Services

Gary Morrison, M.Ed., Director of Industry Training Services

Brigitte Peter-Cherneck, B.A., P.D.P., M.L.S., Institute Librarian

Norman Street, B.Sc.Eng., Ph.D., Director, Technology Centre

## Office of the Registrar

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

### Staff

Mario Mazziotti, Acting Registrar

Karen Cresswell, Associate Registrar; Admissions/  
Student Records

Randy Friesen, Dipl.T., Associate Registrar; Systems  
Timetabling/Registration and Information

Ashifa Manji, Direct Entry/Bachelor of Technology, Admissions  
Officer

Sandie Mooney, Office Administrator

Lois Nightingale, Project Coordinator

## Admissions/Registration and Information

The Admissions Department and the Registration and  
Information Department are located in building SWI on the  
first floor, room 1305.

Full-time Admission/Status Information:

(604) 432-8419

Application Forms and Program/Course Information:

(604) 434-1610

Part-time Registration:

(604) 434-1610

Registration Fax:

(604) 687-2488 or

(604) 430-1331

The Admissions department receives and processes all  
applications for full-time programs.

The Registration and Information department registers  
students for part-time studies courses, answers general  
information inquiries, arranges appointments for Program  
Advisors and Counsellors, and refers inquiries to specific  
areas of the Institute for further assistance.

*continued next page*

## Admissions/Registration and Information cont.

**Note:** Registration for part-time courses can be made by phone, in person, by fax or mail, or via the internet.

Inquiries for program information, application forms and/or publication requests should be directed to Registration and Information at (604) 434-1610. Inquiries from outside the greater Vancouver area may use the toll-free number 1-800-667-0676, Monday to Thursday, 1300-1600. **Note:** The toll-free number is for British Columbia inquiries only.

Office hours are currently under review and may be subject to change

### Admissions (Full-time Program Inquiries)

Monday to Friday 0830-1630

### Registration and Information (Full and Part-time Courses Inquiries)

August 16, 1999 to April 29, 2000

Monday to Thursday 0830-1900

Friday 0830-1630

Saturday 0830-1230

Closed on holiday weekends

Summer: May 1, 2000 to August 12, 2000

Monday to Friday 0830-1630

Saturday Closed

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

### Senior Staff

Anna Dosen, Supervisor; Admissions, Full-time Programs

Kellie Perret, Supervisor; Part-time Registration and Information Services

## Student Records

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

General Inquiries: (604) 432-8498

- transcript requests
- course credit evaluation
- letters of verification
- graduation eligibility
- Full-and Part-time studies records

Student information changes

(address, name, etc.) (604) 432-8353

Student Records, Fax (604) 431-0817

### Senior Staff

Karen Tatham, Coordinator, Student Records Operations

Stacy Robertson, Coordinator, Student Records Systems

## Systems

The Systems department is responsible for maintaining the Registrar's Office systems.

Dawna Mackay, Banner Systems Coordinator

Michelle Philippe, B.Sc., Dipl. T., Registrar's Office Systems Coordinator

## 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

### Senior Staff

George Brown, Supervisor

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# 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 or 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 or landed immigrants. Third priority is given to applicants without Canadian Citizenship or Landed Immigrant (Permanent Resident) status.

All applicants must provide official proof that they meet Institute and program prerequisites. Applicants lacking specific prerequisite courses or required grades will be advised of deficiencies in entrance requirements. It is the applicant's responsibility to upgrade deficiencies to required standards for the program for which they are applying. All applicant documentation must be supplied in the English language. Translations into English are at the applicant's expense. Applicant documentation will not be returned to applicants and become the property of BCIT. Copies should be retained by the applicant for future use.

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

### Fraudulent Documents

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

## Academic Requirements for Admission

Guidelines are established for admission to promote student success in programs. Most programs require grade 12 graduation with specific Grade 11 and Grade 12 subjects. Grade 10 is the minimum entrance requirement for some programs, 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

### Applied Academics:

Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

### B.C. High School Course Details

#### 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.

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### B.C. High School Course Details cont.

- 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.) or Academic English 12 or Technical and Professional Communication 12.
- Where Grade 10 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. Individual assessment by the BCIT Communications department. This can be arranged through the Admissions department; or
2. By successfully completing a BCIT Pre-Entry Communications course. For COMM 0005 or 0008 the requirements are: For English 12 with a B or better, you must achieve a mark of 80 per cent or better; English 12 with a C+ or better, you must achieve a mark of 75 per cent or better; English 12 with a C or better, you must achieve a mark of 70 per cent or better; English 12 with a P or better, you must achieve a mark of 65 per cent or better. Where English 11 is required, you must achieve a mark of 50 per cent or better in COMM 0005 or 0008, or a mark of 75 per cent or better in COMM 0004; or
3. By successful completion of an approved, equivalent English or Communications course at another institution, with the entry grade required for the program you have applied for. Please contact BCIT Registration and Information at (604) 434-1610, to determine the approved equivalents; or
4. By successfully completing the Vancouver Community College English Language Assessment Test. Scores required to satisfy various prerequisites are: for English 12 (Pass to C+) a minimum score of 145 is required; For English 11 or Communications 12 a minimum score of 135 is required; For English 10 a minimum score of 125 is required; or,
5. By successfully completing the Test of English as a Foreign Language (TOEFL) and Test of Written English (TWE). (Proposed: for programs beginning after August 1999: TOEFL/TWE may not be used as a method for meeting English Language requirements for applicants living in Canada. Applicants living in BC/Canada (including International applicants) must meet the English Language requirement by choosing method 1, 2, 3, 4 or 6. Administration of TOEFL on computer will be offered in most countries

throughout the world. Under this program, each test taker will be assigned to an individual workstation equipped with a computer and headphone set. It is not necessary to have previous computer experience to take the test. You will be given all instructions and practice needed to perform the necessary computer tasks before the actual test begins. For more information, you may write to TOEFL/TSE Services, P.O. Box 6151, Princeton, New Jersey 08541-6151, USA. Phone 1-609-771-7100. When ordering information, please indicate which test(s) you will be taking (TOEFL, TSE, TWE) and the country in which you plan to test. Alternatively, you may wish to visit the TOEFL Web site at [www.toefl.org](http://www.toefl.org) and download or order online.

In the following list of test score requirements to meet BCIT program entrance requirements, please note that the scores identified are for the paper-based tests ONLY. To find out more information on what the comparable score requirements are for the computer-based tests, please contact Information and Registration at (604) 434-1610 and ask to speak to a program advisor.

#### Paper-based test score requirements:

English 12 (B or better):  
TOEFL 580+ and TWE 5.0+ and TSE 50+  
English 12 (Pass to C+):  
TOEFL 550+ and TWE 4.5+  
English 11 or Communications 12:  
TOEFL 500+ and TWE not required  
TSE (Test of Spoken English) may be required by some programs, please check the entrance requirements for the BCIT program you are interested in

**Note:** TOEFL test score minimums are currently under review and may be subject to change

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

6. Some Trades programs allow applicants to write a 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.

### 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 specific course prerequisites required 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.



## Graduates of Secondary School Career Preparation Programs

The Career Preparation articulation agreement that BCIT has with B.C. secondary schools is presently under review. In order to facilitate a smooth transition from secondary school to post-secondary education, we believe a revised agreement will better serve students. It is important to note that meeting program prerequisites is still required for acceptance. Applicants who apply to BCIT via Career Prep are not eligible to achieve entrance requirements by way of the Trades Admissions Assessment Test (pretest). Students must apply to BCIT directly from their secondary school Career Prep program. Where there is a break in training between secondary school and applying to BCIT, students are ineligible to apply as Career Prep applicants. Career prep applications will only be processed by the Admissions department if they have been sent to BCIT by the secondary school's counsellor or Career Prep designate. Career Prep applications must be submitted to BCIT Admissions by no later than February 28 in any given year. For further information, please speak with your secondary school counsellor, technical education teacher or call BCIT Registration and Information at (604) 434-1610, or 1-800-667-0676 for inquiries within B.C.

### 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 Registration and Information, Tel. (604) 434-1610. The application fee of \$30 must be paid at the time of application.

Applications received without the \$30 fee will be returned and not processed. Applicants are considered for only one program at a time. Applicants may indicate a first and second choice in order of preference.

**Note:** The \$30 application fee is currently under review and may be increased for applicants applying to programs beginning in August/September 1999.

Applications may also be made through the Internet. To apply access [www.bcit.bc.ca](http://www.bcit.bc.ca), and go into the "Programs" section. Another method is to apply through the Post Secondary Application Service of B.C. (PASBC). To apply access [www.pas.bc.ca](http://www.pas.bc.ca). Applications sent through the Internet will not be processed until the application fee of \$30 is received.

### Admission: When to Apply

Applications are accepted year round. However, applications 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:

Intake Period	Processing Begins
<b>Medical Radiography:</b>	
January 1999	January 1998
January 2000	January 1999
<b>Electronics, Nursing:</b>	
January 1999	June 1998
August/September 1999	October 1998
January 2000	June 1999
<b>ETE</b>	
January 1999	June 1998
May 1999	October 1998
September 1999	October 1998
January 2000	June 1999
May 2000	October 1999

All other Technology programs beginning in September  
August/September 1999      October 1998

### Admission: Trades Programs

Applications for admission to Trades programs are received and processed year-round, on an ongoing basis.

### 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 submission of 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. For applicants who are not Canadian citizens and are submitting official government documents indicating landed immigrant status or student authorization for BCIT and who apply to the Admissions Office in person with, please be advised that BCIT will copy original documents. If applying from outside the Lower Mainland, please submit a notarized copy of your documentation to the Admissions office;

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## Admission: Document Requirements cont.

do not submit original immigration documents. 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 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.

**Note:** According to recent legislation, a criminal search security clearance may be required for applicants seeking acceptance into some BCIT programs. These include Health Sciences programs and Security Alarm Installer. Information will be sent to applicants of programs that fall within this category.

For more information please contact the Registrar's Office at (604) 434-8848.

5. Applicants who have been selected for admission must have medical insurance prior to registration. Non-Canadian students and those without B.C. Medical Insurance 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 number three on the previous page, 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 Registration and Information at (604) 434-1610 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 certain BCIT programs. The ETE program will provide courses in chemistry, communications, mathematics, physics and introduction to computers, which meet some or all of participating program prerequisites. Subject to successful completion, students enrolled in the ETE program will be provisionally accepted into their desired BCIT program, provided the program is participating in the ETE initiative. For further information refer to Academic Studies on page 56.

## 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 0845 to 1200, in Room 340 Building NE1 (J.W. Inglis). Applicants are not required to pre-register but must arrive on time as no one is admitted into the testing room 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. Applicants who live outside the Lower Mainland may arrange to write the exam at a local College, etc. Tel. (604) 451-6832 for more information on sitting this assessment test.

**Note:** Applicants must bring picture ID (driver's licence, passport, etc.) as proof of identity for the purpose of writing this exam.

## Transfer from Regional Colleges

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

## Direct Entry

Direct entry refers to the entry of students to any level of a program beyond level one where advanced standing is given when standard course requirements are recognized as having been completed elsewhere or previously. Direct entry applicants may apply to any level in the program beyond level one, but may also apply to combinations of courses in multiple levels. Sometimes a student's program of study is customized based on the individual student background.

Students are required to complete at least 50 per cent of the credit load of a BCIT program with BCIT courses. Therefore they will only be granted up to 50 per cent transfer credit of the total program credit. Applicants interested in Direct Entry to Trade programs are admitted only if credit is approved and a space has opened up in the program.

In most cases, advanced standing will only be granted where an applicant can show evidence of successfully completing an acceptable equivalent for every single course in the preceding level(s).

Applicants interested in Direct Entry Admission should apply as early as possible and submit all relevant documentation to Admissions. Assessment of applications containing overseas documents may take up to three or four months. For more information call (604) 432-8230.

## Bachelor of Technology

BCIT offers or plans to offer the following Bachelor of Technology Degree programs in:

- Accounting
- Computer Systems
- Environmental Engineering Technology
- Environmental Health (four year, entry-level, full-time)
- Medical Imaging
- Specialty Nursing
- Management
- Manufacturing
- Construction Management
- Electronics (intended implementation Sept. 99)
- Geomatics (intended implementation Sept. 99)
- Computer Integrated Management (proposed)
- Forensic Science (proposed)

Unless otherwise noted above, all Bachelor of Technology programs are offered on a part-time basis and require a relevant BCIT Diploma, or equivalent, English 12, and two years of relevant work experience.

The Bachelor of Technology in Environmental Health is offered as a four-year degree through full-time studies. Admission is based on a number of criteria including specific high school courses.

For more information about Bachelor of Technology degree studies at BCIT see page 53 of this Calendar, or call (604) 432-8230.

## Re-admission

Students who interrupt their full-time studies may apply to re-enter their program at a future date. Re-admission 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. Where a program that was previously completed has since had significant changes made to the course material, then the student may be required to retake and successfully complete additional course. To request re-admission to the Institute, an application form must be completed and submitted to Admissions. A detailed statement indicating goals and intent must be included. For more information please contact (604) 432-8230.

## 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, provided that space is available and 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 "Daytime Course-by-Course Registration" form available at the Student Records office, (SW1 – 1585). Completed forms must be returned to the Student Records office; registration will be permitted upon acceptance. Tuition fees are due and payable three days after the registration form is submitted to the Student Records office. First-time applicants to part-time day courses must submit a full-time application form, a \$30 application fee and official documentation proving that they meet the Institute's general admission requirements of English 12 and proof of citizenship is also required. Applications must be submitted no later than 10 days into the term, otherwise late payment reinstatement charges will apply. Note: The \$30 application fee is currently under review and may be increased for applicants applying to programs beginning in August/September 1999.

## 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 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 admission 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.

*continued next page*

## Offer of Admission cont.

All selected 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 created. If a space becomes available, an applicant on the wait list will be offered the seat. For Technology programs and a few Trades programs, wait lists are not transferred to subsequent intakes. (That is, applicants must re-apply for the next intake).

Applicants to most Trades programs are normally wait-listed on the date their application becomes complete. A complete application is one that has submitted proof that all program entrance requirements have been met. Once added to the wait list the applicant will remain on the wait list until a space becomes available (in this case, applicants do not need to re-apply to subsequent intakes). If there are more applicants than seats available, programs may have a competitive selection process. For information on which Trade programs have wait lists to subsequent intakes and which require a reapplication please contact Registration and Information at (604) 434-1610.

## 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 under-going 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

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 a BCIT approved course of activity.

Coverage will be in effect for all eligible students while on BCIT property or premises, participating in an approved BCIT activity or traveling directly to or from a BCIT approved or organized activity.

BCIT has selected Policy Option A, providing \$15,000 for Accidental Death and 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 per cent 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 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. Please contact the Registrar's Office at (604) 432-8848.



# Apprenticeship

## Apprenticeship

### Industry Training and Apprenticeship Programs

BCIT provides technical and entry-level trades training for many industry training and apprenticeship programs. Industry training and apprenticeship combine in-school instruction with on-the-job training. Participants receive wages during on-the-job training, and government assistance may be available during in-school sessions. Training programs are up to four years in duration, and on completion, graduates receive a credential in recognition of their proficiency in their trade or occupation.

Industry training and apprenticeship programs are overseen by the Industry Training and Apprenticeship Commission (ITAC), a partnership of business, labor, educators and government. The Commission is responsible for more than 100 trades and occupations, and is introducing new programs in the emerging sectors of the economy, such as the knowledge-based industries, aerospace, motion picture and theatre industries and tourism.

Apprenticeship is a time-proven method of giving British Columbians the skills they need for today's economy and globalization. B.C.'s apprenticeship system is recognized world-wide for the quality of its curriculum and graduates. Industry training and apprenticeship offers an outstanding alternative for the nearly 60 per cent of B.C.'s high school graduates who do not attend college or university. As well, because participants earn as they learn, they avoid the mounting debts incurred by many college and university students.

Under ITAC, the industry training and apprenticeship system is being expanded to include new opportunities for learners, to accommodate continuing education leading to college and university credentials, to ease the transition from school to work, and to increase opportunities for under-represented groups.

### Technical Training at BCIT

In consultation with ITAC, BCIT delivers training at all levels to meet business' present and future demands.

### Entry-Level Trades Training (ELTT)

Entry-Level Trades Training (ELTT) provides students with entry level skills that many employers expect from new workers. Eighty per cent of ELTT participants find work within six months of completing the program. ELTT graduates who register as an apprentice within one year of completing the ELTT training will receive credit for the first year of technical training.

ELTT is available in more than 20 apprenticeable trades. Graduates have a high placement in industry. The training of 20 to 40 weeks is designed to accomplish two things:

- Provide basic skills and knowledge.
- Provide employers with people who have demonstrated their ability to become successful and be proficient in their chosen trade, and who can meet the challenges of future technology changes.

### Apprenticeship

The Province of British Columbia contracts between 50 and 60 per cent of all regular apprenticeship technical training to BCIT. Regular classes are scheduled in more than 30 apprenticeable trades.

Apprentices are required to attend technical training courses of four to 10 weeks in duration in each period of apprenticeship. No tuition fees are presently 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 through regular employment insurance eligibility.

### 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 per cent on an approved Interprovincial examination.

### For More Information

For more information on industry training and apprenticeship programs, contact Inquiry B.C. at 1-800-663-7867 and ask for the phone number of the ITAC office nearest you.

For information on related BCIT programs, or to find out if your area of study is associated with an industry training and apprenticeship program, contact Registration and Information at (604) 434-1610 and ask to speak to a program advisor.

*Recycle or pass on  
this publication*



# Co-op

## 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 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 difficult to find. It is the responsibility of the student to work with the coordinator (and independently) to find meaningful work experience.

### Electronic Engineering Technology and Renewable Resources 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 Technology Co-op Office at (604) 451-6910.

### 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

### Manufacturing and Industrial/Mechanical Programs

- Heating, Ventilation, Air-Conditioning and Refrigeration Technician
- Industrial Maintenance Mechanic
- Machinist/CNC Machinist
- Tool and Die Technician

### Transportation Programs

- Automotive Collision
- Automotive Service Technician

### Technology Programs

- Electronic Engineering Technology
- Renewable Resources Technologies

### Cooperative Coordinators Trades Training Programs

#### Transportation

Cynthia Maclean (604) 432-8291  
General Inquiries (604) 432-8634

#### Manufacturing and Industrial/Mechanical

Gino Simeoni (604) 451-7058  
General Inquiries (604) 432-8634

#### Technology Programs Electronic Engineering Technology

Catherine Bennie (604) 432-8499  
General Inquiries (604) 432-8753

#### Renewable Resources Technologies

Judith Hall (604) 451-6911  
General Inquiries (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 the applicable coordinators identified earlier in this section.

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# Student Records

## 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.

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

### c) Titles

- C1. The course title is a concise description of the material covered.
- C2. Courses that are a series will show the series number in the title.

## Course Outlines

The purpose of course outlines is to communicate important course information to students. Course outlines will include the following specific information regarding the course:

- Learning objectives
- Learning activities and content
- Learning assessment methods to be used
- Learning outcomes

Course outlines will be provided to each student during the first class meeting at which time the instructor will respond to any questions or clarifications required.

## 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. A student who discontinues in the full-time program is encouraged to consider Part-time Studies programs. Contact Registration and Information, Program Advising to arrange an appointment with an advisor for Part-time Studies.

### Prior Learning Assessment (PLA)

Many individuals possess skills and knowledge that are equivalent to the requirements of various BCIT courses but which are not presently recognized by a post-secondary educational institution. Individuals who successfully demonstrate that they have this competence could be awarded appropriate academic credit on the basis of an assessment of their learning. Contact Registration and Information at (604) 434-1610 for more information on:

- programs and subjects where PLA is available
- the learning outcomes which must be met to receive credit
- the method of assessment to be used
- the fees assigned to PLA

**Note:** For information on fees associated with PLA, applicants must contact the program area to which the BCIT course belongs.

## Advanced Placement Categories

A maximum of 50 per cent 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 another BCIT course and is required within a program of study 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, and is required within a program from which certification is sought, for:

- course(s) completed at another recognized post-secondary institution;
- approved course(s) that have been completed within or sponsored by a company, government body, or organization;
- official transcripts must be submitted when applying for transfer credit
- a student may withdraw his application for credit up to 14 days after submission of the credit request. If credit is granted and more than 14 days has elapsed, the credit will stand and the student will receive TCR (transfer credit) on his/her transcript.

**Please note:** Transfer credit awarded to any given course(s) is/are applicable only to the term in which it is awarded. If a break in training occurs, previously awarded credit stand in the new term for which the student is entering. This is due to possible changes in curriculum, shifts in technology, etc. Students may be required to reapply for previously awarded credit.

### 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 and 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 per cent 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:

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

## 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.

- 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 currently enrolled at BCIT may apply for credit at any time within the academic year, but no later than 14 days after the commencement of the course for which credit is being requested (see under *Calendar of Events*).
- c. Students who have already been granted 50 per cent of their full program cannot be granted further credit unless further course work is completed to maintain a 50 per cent course load. Course substitutions must be approved by the Dean and Registrar.
- d. Students who receive credit granted may not be eligible for a refund in tuition fees. Fees are calculated based on a student's registered courses for a term (see *Fees and Expenses*, pages 23-27)

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 and/or 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.

## 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.

#### Failure: %

%F is placed beside the percentage grade when the grade received is below the minimum grade required to pass the course.

### Withdrawal:

- W official/approved withdrawal from a course/program within withdrawal deadline. Grade not calculated in weighted or cumulative term averages.
- LW official/approved withdrawal from a course/program after the withdrawal deadline. Grade not calculated in weighted or cumulative term averages.
- V unofficial/unapproved withdrawal. (course discontinuance). Zero grade is calculated in weighted or cumulative term averages.

### Satisfactory:

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

### Unsatisfactory:

- U course requirements not fulfilled, no percentage 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.

### Challenge Credit:

- CCR credit granted by successful completion of a challenge exam.

### Course Exemption:

- ECR recognition of a course completed at BCIT which is equivalent to another BCIT course (used only when course numbers differ and/or program goal changes). Grade not calculated in weighted or cumulative term averages.

### Prior Learning Assessment Credit:

- %L or SL  
credit achieved through Prior Learning Assessment. Grade not calculated into GPA.

### Aegrotat:

- %A grade based on less than 100 per cent course work completed. Student must have a good term record but has an incomplete evaluation (missed assignment or exam worth at least 25 per cent) 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.

*continued next page*

## Examinations, Grading and Marks cont.

### 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.

CIP course in progress

CFT continued following term. Student is continuing in the same course in the following term.

### 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. In order for a withdrawal to be properly "approved" the student wishing to withdraw from one or more courses must arrange to do so through their program head or associate dean, or by meeting with a Student Services counsellor for which an appointment must be made; contact Registration and Information at (604) 434-1610 to arrange. The program head or associate dean will then inform the Registrar's Office. Students wishing to effect a full program withdrawal must complete a withdrawal form which is available at Registration and Information, then meet with their program head or a counsellor and obtain appropriate signatures on the withdrawal form. The completed form must be submitted to Student Records (SWI - 1585).
2. In order for a withdrawal to be "official" the Student must inform their program head or associate dean before the official deadline date for withdrawals (two-thirds of the way through the term or course, see the Calendar of Events, page 28, 29 for the exact date).

If a withdrawal is approved before the official deadline then a W will show on the transcript beside the course(s) in question. If the withdrawal is approved but after the official deadline, then the transcript will show LW beside the course(s) in question. If the withdrawal is not approved, then a grade of V (vacated) will appear on the transcript. The V grade will calculate as 0 (zero) in the student's GPA.

It is the student's responsibility to check withdrawal deadlines (available in the Calendar of Events, page 28, 29). Appeals to the Registrar will be adjudicated by the Registrar and the Dean.

Students withdrawing after the withdrawal deadline date must obtain written permission to do so from their program head.

## Distribution of Marks

A 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 a 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.

## Official Transcripts

A fee of \$5 for the first copy and \$3 for each additional copy, to a maximum of 10 documents, is charged for transcripts. For "Rush" or "Canadian Fax" service, the fee is \$10 fee. For "International Fax" service the fee is \$20. All fees are due at the time the request is made. All requests must be submitted in writing to the Student Records office. Faxed requests are accepted at (604) 431-0817 and will require original signature of requestee, MasterCard or Visa number with expiration date and current phone number.

## Letter of Verification

Students requiring verification of enrolment may request a Letter of Verification (LOV) from the Student Records Office. A fee of \$5.00 will be charged for this letter.

## Withholding Statement of Marks

No statement of marks, transcript, verification letter, 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.

Office of the Registrar – SWI - 2170

## Reassessment of Academic Standing/ Appeal of Academic Standing

Applicants and Students may formally re-assess/appeal the following academic decisions: grades, failures, admission, re-admission, credit transfer, or other academic standing matters. Students wishing to initiate a Reassessment/Appeal of Academic Standing must follow the established and approved procedure. There are specific conditions and deadline requirements throughout the reassessment and appeal process that are strictly adhered to and it is the student's responsibility to ensure that they are familiar with all aspects of these proceedings. To review the Reassessment and Appeal Policies and Procedures, please contact the Office of the Registrar, SWI-1545, Phone: 432-8848. 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 favorably 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.

*The student must first discuss the problem with the Dean of the appropriate program area. 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.

If the appeal is accepted by the Registrar, 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 4.

### 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 re-admission (see Re-admission 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 the appropriate credential 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 will not be honored.

## 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 correspond to the program taken. For more information, contact Registration and Information at (604) 434-1610 and ask to speak to a program advisor.

Most programs prescribe a balance of applied theory and skills necessary for employment in technical, technological or paraprofessional occupations including some curriculum which draws from advanced professional courses.

Advanced credentials are designed to provide practicing 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, BCIT Advanced Diplomas provide a direct path for degree completion. BCIT and the Open Learning Agency through its Open University have entered into collaborative degree arrangements in Business, and Engineering Technology.

BCIT offers Bachelor of Technology Degrees in the various fields of study. Several fields of study are under development and should be offered in the near future. For more information please contact Registration and Information at (604) 434-1610 or 1-800-667-0676, or (604) 432-8230.

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 per cent of the new program. Students wishing to seek approval to apply more than 50 per cent 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 February 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 mail.

## Honors Standing

For Technology programs, honors standing is awarded by the Registrar to a graduating student whose weighted grade point average (GPA) is 80 per cent 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.

The criteria is based on a student's entire program of study, meaning only those courses at BCIT used to achieve that credential. Only those courses that are assigned a percentage grade will be used in GPA calculation.

To be eligible for recognition, the student must:

1. take at least 50 per cent total credit value, (of the pre-scribed courses that are in an approved program of study) from BCIT.
2. obtain an 80 per cent average or greater.
3. 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 their credential. 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, and the President and shall bear the BCIT Coat of Arms.

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 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). There are specific deadlines that apply to submission of applications to graduate for both the February and June Convocation ceremonies. To ensure that you submit your application to graduate within the established deadlines, please contact Student Records at (604) 432-8498.

## Convocation Policy

For a student to be eligible to attend Convocation, he or she must have completed all outstanding coursework, including practicum assignments. No student will be permitted to participate in a Convocation ceremony until a program audit of the student's coursework confirms program completion.

For students who do not complete all coursework prior to the deadlines, they will have until the deadline prior to the next Convocation ceremony to complete outstanding requirements and apply to graduate.

Convocation ceremonies take place two times per year. They usually take place during the third week in February and either the third or fourth week in June each year.

For more information on deadlines for eligibility to attend Convocation, for specifics on which programs participate in Convocation and any other details contained in the Convocation Policy, please contact the Registrar's Office at (604) 432-8848.

# Fees and Expenses

## Full-time Technology Programs

### Tuition Fee Policy for Academic Year 1999/2000 (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 Advanced Education, Training and Technology of Advanced Education, Technology and Training for the academic year 1998/1999 and are subject to change each academic year.

1. A non-transferable, non-refundable commitment fee of \$200 is due upon the applicant's offer of admission. This fee is applied towards the tuition fee and is not transferable to part-time courses, or acceptance into another term.
2. An accepted applicant whose commitment fee has not been paid immediately upon acceptance or provisional acceptance, will forfeit the seat which has been reserved.
3. An accepted or provisionally accepted applicant is required to pay the remainder of first-level and fifth-level fees 60 days before classes commence. (See Calendar of Events).
4. An applicant accepted or provisionally accepted after the specific deadline dates outlined in the Calendar of Events is required to pay full tuition fees upon acceptance or provisional acceptance.
5. One-year post-diploma program students pay according to two-level programs.
6. Students who have not paid their fees by the specified deadline dates outlined in the Calendar of Events will be levied a \$50 late fee. This fee increases to \$150 after 30 calendar days (following and including the first day of classes).

Students will be subject to withdrawal for non-payment of fees and their registration cancelled until full payment has been received by the Institute.

7. Course-by-course day school fees are assessed at \$85 per credit to a maximum tuition fee of \$1119 per level.

Payments can be made by Cash, VISA, Interac, American Express or MasterCard. Cheques or money orders should be made payable to the British Columbia Institute of Technology. Please ensure that your correct student number is included with your payment. BCIT full-time day students may also pay through their bank or credit union, please contact your branch for details.

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

## Annual Fees

Tuition fees and all related policies are under review for the 1999/2000 year by the BCIT Board of Governors and may be subject to change. Current 1998/1999 fees are as follows:

	1st Year	2nd and 3rd Year (each)
General tuition	\$2238.00	\$2238.00
Student activity fee	100.30	100.30
<b>Total:</b>	<b>\$2338.30</b>	<b>\$2338.30</b>

### First-year Students — Subject to change for 1999/2000

All first-level and fifth-level students must pay their fees according to the deadline dates specified in the Calendar of Events.

#### First Level/Fifth Level

General tuition	\$ 1119.00
(includes \$200 non-refundable commitment fee)	
Student activity fee	50.15
<b>Total:</b>	<b>\$1169.15</b>

#### Second Level/Sixth Level

General tuition	\$1119.00
Student activity fee	50.15
<b>Total:</b>	<b>\$1169.15</b>

### First-year Students

International Trade And Transportation Program,  
\$200 CITT Fee

Effective September, 1999 there will be an additional \$100 assessed in Term 1 and Term 2 which goes directly towards accreditation in CITT (Charter Institute of Traffic and Transportation). The \$200 includes the writing fee for the two CITT national exams and registration in CITT.

### Second Year Students — Subject to change for 1999/2000

All second and third-year students must pay their fees according to the deadline dates specified in the Calendar of Events. (see page 28 and 29)

#### Third Level

General tuition	\$1119.00
Student activity fee	50.15
<b>Total:</b>	<b>\$1169.15</b>

#### Fourth Level

General tuition	\$1119.00
Student activity fee	50.15
<b>Total:</b>	<b>\$1169.15</b>

*continued next page*

## Annual Fees cont.

### Adult Echocardiography

General tuition	\$1119.00
Student activity fee	50.15
<b>Total:</b>	<b>\$1169.15</b>

### Medical Laboratory — Fifth Level only

Registration Fee	\$300.00
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### Co-op Fees — Subject To Change for 1999/2000

*Note: Co-op Program specific dates are outlined in the Calendar of Events.*

### Electronics and Robotics (per level)

General tuition	\$400.00
Student activity fee	19.50
<b>Total:</b>	<b>\$419.50</b>

### Renewable Resources (per level)

General tuition	\$360.00
Student activity fee	17.50
<b>Total:</b>	<b>\$377.50</b>

### Mining (per level)

General tuition	\$400.00
Student Activity fee	19.50
<b>Total:</b>	<b>\$419.50</b>

## 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 1999/2000. An additional \$50 late fee will be assessed if fees are not paid by the due date. Students will be subject to withdrawal for non-payment of fees. This fee increases to \$150 after 30 calendar days from the commencement of classes.

## Advanced Studies in Business Registrants

All students must pay according to the specified dates outlined in the Calendar of Events. Course-by-course fees are assessed to a tuition fee maximum of \$1119 per term/level. These fees are subject to change for 1999/2000. Students will be subject to withdrawal for non-payment of fees. Late fee policies also apply to this program.

## Bachelor of Technology Degree Program

All students must pay according to the specified dates outlined in the Calendar of Events. For accepted students course-by-course fees are assessed to the tuition fee maximum of \$1800 per term. These fees are subject to change for 1999/2000. Students will be subject to withdrawal for non-payment 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 in Technology Programs

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.

## Book and Equipment Costs

Please note, in addition to tuition fees, there will be book and/or equipment costs associated with your program. Each program will have unique requirements for books and equipment. To obtain an estimate of these costs, please contact Student Services or the departmental offices associated with your program.

## Full-time Trades Programs

### Tuition Fee Policy for Academic Year 1999/2000 (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 Advanced Education, Training and Technology for the academic year 1998/1999 and are subject to change each academic year.

1. A non-refundable, non-transferable commitment fee of \$100 is due upon the applicant's offer of admission into a BCIT program.
2. An accepted applicant whose commitment fee has not been paid immediately upon acceptance or provisional acceptance will forfeit the seat that has been reserved.
3. An accepted applicant or provisionally accepted applicant is required to pay the remainder of the fees 60 days prior to the intake start date. (Subject to change).
4. Students who have not paid their fees by the end of the first week of classes will be levied a \$50 late fee. This fee increases to \$150 after 30 calendar days. Students will be subject to withdrawal for non-payment of fees and their registration cancelled until full payment has been received by the Institute.



Payments can be made by Cash, Visa, Mastercard, American Express, Interac or Cheque. Cheques or money orders should be made payable to the British Columbia of Technology (BCIT). Please ensure that your correct student number is included with your payment. BCIT full-time day students may also pay through their bank or credit union, please see your branch for details.

### Annual Fees (subject to change for 1999/2000)

Tuition fees and all related policies are under review for the 1999/2000 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 current 1998/1999 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 current 1998/1999 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.

Students not attending either the Burnaby campus or the Sea Island campus are assessed \$0.90 per week for Student Activity Fees.

Effective September 1, 1998 all Sea Island programs will be assessed a \$100 Tool Deposit/Lab Fee. This additional fee will not affect returning students, only new students starting September, 1998.

### International Students in Trades Programs

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.

#### Sea Island Campus (subject to change for 1999/2000)

\$100 Tool Deposit/Lab Fee only assessed in Term 1

Program Name	Tuition Fee	Activity Fee	Lab Fee	Total
The following programs are assessed per term:				
Aircraft Maintenance				
Term 1	1017.00	34.40	100.00	1151.40
Other Terms	1017.00	34.40		1051.40
Aircraft Electronics Avionics				
Term 1	1017.00	34.40	100.00	1151.40
Other Terms	1017.00	34.40		1051.40
Aircraft Manufacturing Structures one term only	528.00	34.40	100.00	662.40
Aircraft Structures				
Term 1	528.00	34.40	100.00	662.40
Term 2	693.00	45.15		738.15

Program Name	Tuition Fee	Activity Fee	Lab Fee	Total
Aircraft Gas Turbine Technician—Term 1	528.00	34.40	100.00	662.40
Term 2	726.00	47.30		773.30
Aircraft Mechanical Components Technician—Term 1	528.00	34.40	100.00	662.40
Term 2	429.00	27.95		456.95
Electronics Core*	990.00	64.50	75.00	1129.50
Special Sea Island Course*				
Sea Island Program Extensions:	(1998/1999) Tuition	\$78.00/wk		
	SA Fees	\$ 2.15 /wk		
Aircraft Structures Extensions:	(1998/1999) Tuition	\$39.00/wk		
	SA Fees	\$ 2.15/wk		

#### Burnaby Campus

The following programs are assessed by program duration:

Advanced Industrial Computing	660.00	43.00	75.00	778.00
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 Educ Program	384.00	25.20		409.20
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
-Satellite Campus	1152.00	30.60		1182.60
Auto Mechanic-Toyota Spons	1350.00	86.00	250.00	1686.00
Benchwork ELTT (Joinery )	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 Operator	224.00	30.10	75.00	329.10
Computer Systems Service Tech	1320.00	86.00	75.00	1481.00
Diesel Engine Electronics Tech	330.00	21.50		351.50
Diesel Engine Mechanic ELTT	1416.00	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
Electrical Prod Distribution	660.00	43.00	75.00	778.00
Electricity ELTT and Ind Electronics	1350.00	86.00	75.00	1511.00
-Satellite Campus	1350.00	36.00	75.00	1461.00
Electronics Technician (Core)				
Full-time Day	990.00	64.50	75.00	1129.50
-Satellite Campus	990.00	27.00	75.00	1092.00
Electronics Technician (Core)				
Part-time Evening (Per Year)	613.00	32.25	40.00	685.25
Fresh Start Program	627.00	40.85		667.85
H.V.A.C. R. Program—Term 1	1005.00	66.00		1071.00
H.V.A.C. R. Program—Term 2	660.00	43.50		703.50
H.V.A.C. R. Program—Term 3	330.00	21.50		351.50
Heavy Duty Mechanic ELTT	1020.00	64.50		1084.50
Inboard/Outboard Mechanic	1152.00	73.10		1225.10
Ind Instrumentation Service Tech	1320.00	86.00	75.00	1481.00
Indus Maint Mechanic—Term 1	768.00	50.40		818.40

continued next page

## Annual Fees cont.

Program Name	Tuition Fee	Activity Fee	Lab Fee	Total
Indus Maint Mechanic—Term 2	768.00	50.40		818.40
Indus Maint Mechanic—Term 3	528.00	34.40		562.40
Ironworker ELTT	789.00	49.45		838.45
Joinery ELTT	954.00	60.20		1014.20
Machinist ELTT	1284.00	81.70		1365.70
Machinist/CNC Mach—Term 1	980.00	63.00		1043.00
Machinist/CNC Mach—Term 2	980.00	63.00		1043.00
Machinist/CNC Mach—Term 3	660.00	43.00		703.00
Marine Elect Service Tech	1320.00	86.00	75.00	1481.00
-Satellite Campus	1320.00	36.00	75.00	1431.00
Millwright ELTT	1317.00	83.85		1400.85
Motorcycle Mechanic ELTT	1152.00	73.10		1225.10
Painting and Decorating	660.00	43.00		703.00
Plumbing ELTT	1020.00	64.50		1084.50
Power Eng (Gen and 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 ELTT	690.00	43.00		733.00
Steamfitting ELTT	1020.00	64.50		1084.50
Steel Fabrication ELTT	789.00	49.45		838.45
Steel Fabrication—Welding	561.00	36.55		597.55
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
Trades Discovery for Women	660.00	43.00		703.00
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-time Students are students who are not registered for an entire program and are assessed as stated below:

**Initial Registration:** \$132 per month (four weeks) and  
\$8.60 per month S.A. Fee = \$140.60 month (four weeks)

**Program Extensions**(subject to change for 1999/2000):

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 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	99.00	6.45	105.45
4 weeks	132.00	8.60	140.60

**Book and Equipment Costs**

Please note: in addition to your tuition fees, there will be books and/or equipment costs associated with most programs. Each program will have unique requirements for books and equipment. To obtain an estimate of these costs, please contact Student Services or your departmental offices associated with your program.

**Miscellaneous Fees**

Application Fee	\$30
Application Fee-International	\$200
Prior Learning Assessment Fee	Cost Varies For Each Program
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	\$60 September—December
January—May	\$75
*Parking: Trades Students	\$15 monthly
*Parking: Night School Students	\$16 per Term
*Other Student Parking Rates	\$7.50 per month— student handicapped per month— student motorcycle
Reassessment of Marks	\$25 per course
Student Appeal of Reassessment	\$50 per course
Replacement Diploma/Certificate	\$50
Transcript of Marks	\$5 for first copy and \$3 for each additional copy
Additional Transcript Services:	\$10 Rush Copy \$20 Rush/Fax Copy \$20 International Fax copy
Verification of Enrolment Letter	\$5 per copy
Fax	\$10
Overseas Fax	\$20
*all taxes included	

**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 BCIT Registration and Information.

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 \$200.

**Student Activity:** Complete refund.

In all cases the Commitment Fee is non-refundable.

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 \$100.

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 \$100.

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. There are certain *Electrical Trades* programs where a refund for failure of level 1 and 2 or a transfer to the next level may be approved, please see your chief instructor.

### 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.

### 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.

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## TRAVEL CUTS

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SFU - Rm 2290 MBC, Burnaby ... 291-1204  
120 W. Broadway (next to Mountain Equipment Co-op)...659-2887

Owned and Operated by the Canadian Federation of Students

# Calendar of Events 1999/2000

## 1999

### MAY

24 Mon Victoria Day - BCIT Closed  
25-28 Tue/Fri Examinations for most Technologies, all levels

### ETE

10 Mon Last day to withdraw and receive a full refund (less \$200 commitment fee)  
10 Mon Last day to apply for course credit (exemption) and/or change registration to audit status

### Nursing

3-7 Mon/Fri All levels: Examinations

### JUNE

23 Wed Graduating Awards Ceremonies  
23-25 Wed-Fri Spring Convocation Ceremonies

### JULY

1 Thr Canada Day - BCIT Closed  
9 Fri Level 1,5,7 (full-time programs only) fee deadline for Fall Term

### ETE

2 Fri Last day to withdraw and receive a "W" on transcript

### AUGUST

2 Mon B.C. Day - BCIT Closed

### Electronics

31-  
Sep. 2 Tue-Thr Registration for students on Modified Programs

### ETE

3-6 Tue-Fri Examinations  
11 Wed Marks Meetings

### Nursing

16 Mon Level 1-5: Registration and Orientation  
20 Fri Level 2-5: Fee deadline for classes starting August  
31 Tue Last day to withdraw and receive a full refund (less \$200 commitment fee)  
31 Tue Last day to apply for course credit (exemption) and/or change registration to audit status

### SEPTEMBER

6 Mon Labour Day  
7-8 Tue-Wed Level 1, 3, 5, 7 Full-time Programs Registration  
8 Wed Level 1, 3, 5, 7 Full-time Programs Classes Start  
10 Fri Level 3 Fee Deadline  
21 Tue Last day to withdraw and receive a full refund (less \$200 commitment fee)  
21 Tue Last day to apply for course credit exemption or change of status to "audit" for Full-time Courses  
TBA Shinerama

### Electronics:

Aug. 31-  
Sep. 2 Tue-Thr Registration for students on Modified Programs  
7-8 Tue-Wed Levels 1, 2, 3, 4 Registration/Orientation  
7 Tue Co-op Work terms 1 and 2 begin  
17 Fri Last day to change sections for students on modified programs

### ETE

7 Tue First Day of Classes  
21 Tue Last day to withdraw and receive a full refund (less \$200 commitment fee)  
21 Tue Last day to apply for course credit (exemption) or change status of registration to "audit"

### OCTOBER

11 Mon Thanksgiving Day  
27 Wed Fall Awards Ceremony

### Electronics

13 Wed Last day to withdraw and receive a "W" from Term A courses  
29 Fri Term A courses End

### ETE

20 Wed Mid-term Marks Meetings

### Nursing

29 Fri Last day to withdraw in order to receive a "W" on transcript

### NOVEMBER

5 Fri Level 1 fee deadline for Winter Term of Full-time Programs  
9 Tue Last day to withdraw and receive a "W" on transcript for full term courses

### Term Courses

11 Thr Remembrance Day

### Electronics

1 Mon Term B courses Begin  
17 Wed Last day to withdraw and receive a "W" on transcript for fall term Full-time Courses

### ETE

5 Fri Last day to withdraw from courses and receive a "W" on transcript

### Medical Radiography

5 Fri Level 1: Fee deadline for January 4, 2000 start

### DECEMBER

6-10 Mon-Fri Examination Week for Most Technologies  
15-16 Wed-Thr Marks Meetings  
24 Fri Christmas Eve - BCIT closed  
25 Sat Christmas Day - BCIT closed  
26 Sun Boxing Day - BCIT closed  
27 Mon In lieu of Christmas Day - BCIT Closed  
28 Tue On lieu of Boxing Day - BCIT Closed  
31 Fri New Year's Eve - BCIT Closed

### Electronics

3 Fri Level 1 fee deadline for Winter Term  
8 Wed Last day to withdraw and receive a "W" for Term B courses  
17 Fri Last day of classes before Christmas Break

### Nursing

6-10 Mon-Fri Examinations

### ETE

3 Fri Last day of classes  
6-10 Mon-Fri Examinations  
15 Wed Marks Meetings

# 2000

## January

1	Sat	New Year's Day – BCIT Closed
3	Mon	In lieu of New Year's Day
4	Tue	Classes begin for most Full-time Programs
7	Fri	Level 2, 4, 6, 8: Fee Deadline for Winter Term
18	Tue	Last day to withdraw from classes and receive a full refund (less \$200 commitment fee)
18	Tue	Last day to apply for course credit (exemption) and or change registration to audit status

## Electronics

4	Tue	Classes resume for Electronic Engineering Technology
10-14	Mon-Fri	Examinations for all Levels
26-27	Wed-Thr	Timetabling/Registration for students on modified programs
28	Fri	Registration/Orientation for Level 1 students
31	Mon	All Levels: First day of classes for Winter Term

## ETE

4	Tue	First Day of Classes
18	Tue	Last day to withdraw and receive a full refund (less \$200 commitment fee)
18	Tue	Last day to apply for course credit (exemption) or change status of registration to audit status

## Medical Radiography

4	Tue	Level 1&3: Student Orientation
7	Fri	Level 3: Fee Deadline

## Nursing

4	Tue	Levels 1-4: Registration and Orientation/Classes begin
7	Fri	Levels 1-4: Fee deadline
10	Mon	Level 5: Registration/Classes begin
14	Fri	Level 5: Fee deadline
18	Tue	Levels 1-4: Last day to apply for course credit (exemption) and/or change registration to audit status
18	Tue	Levels 1-4: Last day to withdraw and receive a full refund (less \$200 commitment fee)
25	Tue	Level 5: Last day to withdraw and receive a full refund (less \$200 commitment fee)

## FEBRUARY

15	Tue	Last day to withdraw from Term A courses and receive a "W" on transcript
17	Thr	Winter Convocation Ceremonies

## Electronics

4	Fri	Levels 2, 3, 4 and Co-op fees due
11	Fri	Last day to change sections for students on modified programs
15	Tue	Level 1: Last day to withdraw from classes and receive a full refund (less \$200 commitment fee)
15	Tue	Last day to apply for course credit (exemption) and or change registration to audit status

## MARCH

13-17	Mon-Fri	Spring Break (except Nursing & Electronics Engineering Technology)
20	Mon	Term B courses begin

## Electronics

8	Wed	Last day to withdraw to receive "W" on transcript for Term A courses
24	Fri	Term A Courses end
27	Mon	Term B courses begin

## Nursing

6-10	Mon-Fri	Spring Break
24	Fri	All Levels: Last day to withdraw and receive "W" on transcript

## APRIL

TBA		Open House
7	Fri	Last day to withdraw and receive a "W" on transcript for full term courses
21	Fri	Good Friday – BCIT Closed
24	Mon	Easter Monday – BCIT Closed
28	Fri	Last day to withdraw and receive a "W" on transcript for Term B courses

## Electronics

12	Wed	Last day to withdraw and receive a "W" on transcript for full term courses
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## ETE

14	Fri	Last day of classes
17-20	Mon-Thr	Examinations
25	Tue	First Day of Classes

## Medical Radiography

25-28	Tue-Fri	Examination Week
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## MAY

22	Mon	Victoria Day – BCIT Closed
23-26	Tue-Fri	Examinations for most Technologies, all levels

## Electronics

3	Wed	Last day to withdraw and receive a "W" on transcript for Term B courses
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## ETE

9	Tue	Last day to withdraw and receive a full refund (less \$200 commitment fee)
9	Tue	Last day to apply for course credit (exemption) or change status of registration to "audit"
		Medical Radiography practicums begin in May

## Nursing

1-5	Mon-Fri	Examinations for all Levels
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## JUNE

21	Wed	Spring Award Ceremonies
21-23	Wed-Fri	Spring Convocation Ceremonies

## ETE

30	Fri	Last day to withdraw from courses and receive a "W" on transcript
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## JULY

## ETE

28	Fri	Last day of classes
31-		
Aug 4	Mon-Fri	Examinations



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## Registration and Information

Reception for Program Advising and Counselling takes place in the Registration and Information department, which is located on the 1<sup>st</sup> floor of the SWI building. Hours of operation for Registration and Information are 0830-1630, Monday-Friday, however, evening service is available at various times of the year. Phone (604) 434-1610 for information. Reception for Financial Aid and Awards is located at the northwest corner, 2<sup>nd</sup> floor of the SWI building; their hours of operation are 0830-1600, Monday-Friday. The phone number for Financial Aid reception is (604) 432-8555.

### Staff

Jim Mitchell, Director, Student Services  
Kumal Gill, Marketing Systems Coordinator, Enrolment Management

## Program Advising

Program Advisors advise prospective students on full- and part-time programs, career opportunities and pre-entry preparation. We help students select programs based on skill requirements and their own career goals. Students with undefined goals may be referred to BCIT's career, educational and personal development courses. Program Advisors participate in secondary school, college and community visits throughout the province, and in BCIT evening program information sessions, familiarizing prospective students with BCIT programs and services. To make an appointment, or for more information, please contact us at:

Tel.: (604) 434-1610, Fax: (604) 433-1184, Program Advising Toll-Free (B.C.— outside Lower Mainland, Monday — Thursday, Hours 1300-1600): 1-800-667-0676,  
E-mail: [services@bcit.bc.ca](mailto:services@bcit.bc.ca) (In order for us to respond to your inquiry you must provide your birthdate, address and telephone number).

### Program Advisors:

Raelene Christie, B.A., Coordinator  
Janeen Alliston, B.A.

Linda Becerra, B.A.

Katy Bobetsis, B.A., Dipl.T.

Chikako Fong, B.A.

Debbie Saxby, P.D.P.

Program Advisors

Part-time Studies:

Ann McNaughton, Cert., Engineering Technologies and Trades

Chris Lloyd, Dipl.T., Business and Computing Studies

Sandra Zanatta, B.A. Business and Computing Studies

## The NOW Project

The NOW Project coordinates BCIT's services and programs for Youth Works, Welfare to Work program participants and others receiving income assistance. Individualized services available to prospective and registered students include:

- information on welfare changes related to training
- assessments for upgrading or tutoring
- guidance and orientation through the system
- student support groups
- use of computing facilities and resource centre
- one-on-one support
- tutoring and workshops
- referrals and assistance to access services in BCIT and in the community

Drop in hours are 1230 -1600, Monday to Thursday in Building SWI, Room 2105. Please call for your initial appointment, or if you have questions regarding our services or your eligibility.

### Staff

Deanna L. Rexe, Manager  
Janice Pontes, Now Project Advisor  
Lisa Moy, Now Project Advisor  
Amy Haugejorden, Now Project Advisor  
Dawn Whitworth, Employment Advisor  
Morey Altman, Project Assistant

## Counselling Services

A Counsellor Can Help You To:

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

### For Enrolled Students: (Full-time and Part-time) Educational Counselling

Attending a post-secondary institute can present unexpected challenges. The transition from high school to post-secondary or re-entering school after an absence can be big adjustment. Our Counsellors help you with study skills, time management, communication skills and to increase your level of concentration and motivation.



## 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 successful and effective 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 Development and Wellness Workshops

Early morning, noon-hour and afternoon workshops are offered on such topics as:

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

See Counselling Services posters for term schedule. Program specific workshops are offered on request, subject to availability.

### Ongoing Weekly Counselling Support Groups

#### Personal Development Workshops:

- Building Self-Esteem and Assertiveness.  
Pre-registration is required.

#### Student Success Tips

1. Know which services are available to you.
2. Know where they are located.
3. Know how to access the service.
4. Use your campus resources
5. Don't wait until you're in a crisis.

## Orientation to BCIT

### Early Orientation

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

Counsellors offer a short course called BCIT Preparation: An Early Orientation. See list of courses at the end of this section.

### 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 Exploration, 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 help you to 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. We also can discuss degree completion opportunities.

### Counselling Student Life and Career Resource Centre

Reference material on student life, career planning and educational information is available. This includes brochures and handouts.

### Referrals

#### To Counselling from:

- self-referral: Drop in or call (604) 434-1610 (Registration and Information reception)
- peer referral: classmates, Residence Advisors
- faculty/staff/administration: e.g. Instructor
- family/friends referral
- agency referral
- Student Services referral

#### From Counselling to:

- faculty or administration
- other student services
- community resources and support services

*continued next page*

## Counselling Services cont.

### For Prospective Students

Prospective students are seen for Career Counselling on referral from:

- Career, Educational and Personal Development courses
- Program Advisors
- faculty/staff or administration
- external agencies or organizations

Prospective students are encouraged to register for Career, Educational and Personal Development courses listed below.

### Career, Educational and Personal Development Courses

These courses help you to:

- make a first time career choice
- make a career change
- develop your career
- access current information about career and educational options
- learn about jobs of the future
- prepare to become a BCIT student

To register contact BCIT Registration and Information at (604) 434-1610 or (604) 412-7777

## Looking for a New Career?

If you don't know where to start, attend:

CEPD 0100: INTRODUCTION TO CAREER PLANNING

If you are considering BCIT, are undecided about your career choice and would like to learn more about the career planning process, this two-hour course will introduce you to the following topics:

- steps in the career planning process
- explore interests
- research career/educational options

If you want to relate your interests and strengths to a career

attend: CEPDO101: CAREER TESTING

If you want to explore your career options by writing a series of standardized tests, this course will assist you to access information to identify your:

- interests
- aptitudes
- values and
- personal style
- summary profile for Career and Lifestyle planning

If you want to write tests and explore work and educational options, attend: HRMGO315: CAREER SEARCH WORKSHOP

If you want to explore and research career options by writing tests, accessing current information and resources and learning how to specify goals and make a career change, this course will cover the following topics:

- interests, aptitudes, values clarification and testing
- career and educational opportunities
- decision-making
- goal setting and implementation

If your organization is downsizing or restructuring, arrange for: CEPDO103: CAREER TRANSITIONS

This is a program of tests and activities designed for groups of workers or companies experiencing restructuring or downsizing. Call Counselling Services at (604) 434-1610 for more information.

## Preparing to Become a BCIT Student?

If you have been accepted into a BCIT full-time program and want to get ready for BCIT attend: CEPDO200:BCIT PREPARATION: EARLY ORIENTATION

This course is an early orientation for students accepted into BCIT's programs. Topics will include introduction to factors in student success, study skills, time and stress management and accessing support and assistance at BCIT.

### 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, consistent with the College of Psychologists and the B.C. Colleges and Institutes Counsellors' Association accepted ethical standards.

Stu Gibbs, B.A., M.S. Ed., Counsellor, (604) 432-8436  
sgibbs@bcit.bc.ca

Heather Hyde, B.A., M.A., R. Psych, Counsellor  
(604) 432-8432, hhyde@bcit.bc.ca

Jean Spence, B.A., M.Ed., C.C.C., Counsellor, Coordinator  
(604) 432-8435, jspence@bcit.bc.ca

### Confidentiality

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

### Counselling Services

Counselling Reception: SW1 1300  
Counselling Offices: SW1 2300  
Telephone: (604) 434-1610  
Web Site: [www.bcit.bc.ca/serviceshome.htm](http://www.bcit.bc.ca/serviceshome.htm)

## 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.
- Prospective students are seen on referral only
- Counselling Services are free of charge and available from 08:30 am - 16:30 pm, Monday - Friday

## Services for First Nations Students

The First Nations Services department provides culturally appropriate services and programs for students of Aboriginal ancestry including status and non-status people, Metis and Inuit.

### First Nations Staff

Brenda Ireland, M.A., Coordinator	Tel. (604) 451-6901
Greg George, Advisor	Tel. (604) 451-7026
Gerry Oleman, Cultural Advisor	Tel. (604) 412-7414
Bob George, Elder Advisor	Tel. (604) 432-8474
Celeste Spinks, Admin. Assistant	Tel. (604) 432-8474
Department	Fax (604) 434-2057

Educational resource centre for students with disabilities  
BCIT is committed to providing access to students with disabilities. We offer a variety of support services to any full- or part-time student with a disability including:

- career, personal, educational and vocational rehabilitation counselling
- interpreting services
- agency and faculty liaison
- notetaking
- taped books
- learning strategies support
- exam accommodations
- access to service and technology loans

**Students with learning disabilities:** should provide recent documentation in order to determine learning strengths, identify appropriate support services and access accommodations. Also, for students with learning difficulties we suggest taking advantage of the Learning for Success Program to assist students with general learning skills and strategies that can be applied in any environment where structured learning is required. Please contact the Educational Resource Centre department for further information. TAB/ABESAP funding may be available for those who qualify.

**Students with mobility impairments:** Handicapped parking is available for students with a Sparks sticker. Also, arrangements may be made through the ERC for timetable and locker adjustments to obtain a close proximity of classes.

**Students who are deaf and hard of hearing:** Interpreting services are provided for all courses and programs at BCIT based on three months advance notice, documentation and availability of interpreters.

**Students with visual disabilities or learning disabilities which severely affect reading abilities:** should apply for taped textbooks and/or adapted equipment at least three months before classes begin, to ensure availability.

It is recommended that three to four months lead time be given to access support services, particularly for taped books and visual language services. Please contact the Educational Resource Centre regarding these services.

## Appointments

For an appointment contact the ERC reception, Tel: (604) 451-6963, Fax: (604) 433-1184, or TTY (604) 432-8954, e-mail [kharvey@bcit.bc.ca](mailto:kharvey@bcit.bc.ca), Web site: [www.bcit.bc.ca](http://www.bcit.bc.ca).

Counselling hours are Monday to Friday 0830-1630. Students in crisis can be seen with a minimum of delay. Counselling services are free of charge. We are located in Building SW1 - Room 2300.

### Staff — Educational Resource Centre for Students with Disabilities

Shirley Coomber, M.Ed., A.R.W., Provincial Interpreting  
Project Coordinator/Vocational Rehabilitation  
Specialist/Coordinator

Derek McLauchlan, Ph.D., Learning Specialist/Coordinator  
Kathleen Musial, B.Sc., B.Ed., Instructor, Learning for Success  
program

Lorena Pelly, R.N., B.A., M.Ed., Vocational Rehabilitation  
Specialist

Linda Young-Jones, M.Ed., CCRC, Vocational Rehabilitation  
Specialist

Marna Arnell, B.A., Dipl. Int., Provincial Interpreting Facilitator  
Joyce Davidson, B.A., Administrative Assistant/Interpreting  
Supervisor

Karen Harvey, ERC/SS Reception Specialist

Karen Poirier, Admin. Support

Provincial Interpreting Services Project

## 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, information sessions can give you some direction and help with your educational decision. Check with the Registration and Information department about additional "program specific" information sessions that are also held throughout the year or visit the BCIT Web site at [www.bcit.bc.ca](http://www.bcit.bc.ca) for an up-to-date list of information sessions.

**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.

### Trades Training

These sessions will consist of an overview of Trades Training programs followed by a tour of selected BCIT Trades Training facilities.

Fri — Sep 25, 1998  
 Fri — Oct 23, 1998  
 Fri — Nov 27, 1998  
 Fri — Jan 29, 1999  
 Fri — Feb 26, 1999  
 Fri — Mar 19, 1999  
 Fri — Apr 23, 1999  
 Fri — May 28, 1999  
 Fri — Jun 25, 1999

Where: Registration and Information  
 Presentation Room (SW1 - 1125)  
 When: 0900 - 1200  
 Register: Call Registration and Information  
 at (604) 434-1610 up to one  
 month prior to the date you want  
 to attend. (e.g. for the September 25 session  
 you can call anytime after August 25)

### Electrical and Electronic Technology

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

Tue — Oct 13, 1998  
 Wed — Feb 24, 1999  
 Wed — May 26, 1999

Where: IBM Building - Theatre 233  
 When: 1830 - 2030  
 Register: Call Registration and Information  
 at (604) 434-1610 up to one month prior  
 to the date you want to attend.

### Plastics Technology

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

Thurs — Mar 25, 1999

Where: Building SE2 Town Square Conference Rooms  
 When: 1830 - 2030  
 Register: Call Registration and Information  
 at (604) 434-1610 up to one month prior  
 to the date you want to attend.

### Business

These sessions will provide information on all full-time programs offered through Business. 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 Registration and Information at (604) 434-1610 to arrange an interview with a program advisor.

Tue — Nov 17, 1998  
 Tue — Feb 23, 1999  
 Tue — Apr 20, 1999

Where: IBM Building - Theatre 233  
 When: 1830 - 2030  
 Register: Call Registration and Information  
 at (604) 434-1610 up to one month prior  
 to the date you want to attend.

### Bachelor of Technology Programs - Business

Join us at these sessions to learn about BCIT's new degree credentials within Business. Information on the following programs will be presented: Bachelor of Technology in Accounting, Bachelor of Technology in Management and the Bachelor of Business Administration Degree (Open Learning University, BCIT collaborative program).

Mon — Oct 19, 1998  
 Mon — Feb 8, 1999  
 Mon — May 10, 1999

Where: IBM Building - Theatre 233  
 When: 1830 - 2030  
 Register: Call Registration and Information  
 at (604) 434-1610 up to one month prior  
 to the date you want to attend.

## **Business - Program Specific Information Sessions**

### **Broadcast Communications**

**Broadcast Communications** holds information sessions the first Monday of each month, from September to June and on the last Monday in August. If the first Monday falls on a holiday, the session will be moved to the following Monday.

Where: Broadcast Centre - Building SE10 - Lobby  
When: 1730 - 1830  
Register: Call Broadcast department at (604) 432-8863

### **Tourism Management**

Applicants to the **Tourism Management Program** are urged to attend one of the Information Sessions offered in the Fall and Spring. These are two-hour, free of charge, and open for anyone to attend, with no prior registration required. Sessions will be held in Room 207 of the IBM Building (SE6) on the Burnaby campus, with signs posted at entrances to the building if a room change occurs. Scheduled dates and times for the 1998/99 are shown following. For further information, please contact Registration and Information at (604) 434-1610 or contact the Tourism program head.

Fri — Oct 23, 1998  
Sat — Nov 21, 1998  
Sat — Feb 20, 1999  
Fri — Mar 19, 1999  
Sat — Apr 17, 1999  
Fri — May 14, 1999

Where: Building SE6 Room 207  
When: Friday's 1900-2100  
Saturday's 1000-1200

Register: Pre-registration is not required. However, if you require further information on the sessions please call Registration and Information at (604) 434-1610, or contact the Tourism program head.

### **Real Estate Marketing Management**

Join us at this session to find out all the exciting aspects of real estate – it's not just about selling residential property! Meet the program head and learn about licensed and unlicensed careers available upon completion of this program.

Tue — Dec 8, 1998  
Tue — Mar 2, 1999  
Tue — Apr 6, 1999  
Tue — May 4, 1999

Where: Building SE2 Town Square Conference Rooms  
When: 1830-2030  
Register: Call Registration and Information at (604) 434-1610 up to one month prior to the date you want to attend.

## **Applied Operations Management Certificate, Operations Management Diploma, International Trade and Transportation Programs**

These sessions will cover all aspects of the Applied Operations Management Certificate program, the Operations Management and International Trades and Transportation Diploma programs. Included will be information about workload, class structure, program content and career information.

Wed — Oct 7, 1998  
Wed — Nov 4, 1998  
Wed — Feb 3, 1999  
Wed — Mar 3, 1999  
Wed — Apr 7, 1999  
Wed — May 5, 1999  
Wed — June 2, 1999

Where: Building SE2 Town Square Conference Room  
When: 1800 - 1900  
Register: Call Registration and Information at (604) 434-1610 up to one month prior to the date you want to attend.

### **Computer Systems Technology**

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

Mon — Nov 2, 1998  
Mon — Dec 7, 1998  
Wed — Jan 20, 1999  
Wed — Feb 17, 1999  
Wed — Mar 24, 1999  
Mon — May 3, 1999

Where: IBM Building - Theatre 233  
When: 1830 - 2030  
Register: Call Registration and Information at (604) 434-1610 up to one month prior to the date you want to attend.

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### **Bachelor of Technology in Computer Systems Technology**

Join us at these sessions to learn about BCIT's new degree credential in Computer Systems Technology. The program head for this degree program will present valuable information on entrance requirements, course content and graduate outcomes.

Thu— Oct 8, 1998  
Thu— Nov 12, 1998  
Thu— Feb 18, 1999  
Thu— June 3, 1999  
Thu— Oct 14, 1999  
Thu— Nov 11, 1999

Where: Building SE2 - Town Square Conference Rooms  
When: 1830 - 2030  
Register: Call Registration and Information  
at (604) 434-1610 up to one month prior  
to the date you want to attend.

### **Bachelor of Technology in Construction Management Technology**

Join us at these sessions to learn about BCIT's new degree credential in Construction Management Technology. The program head for this degree program will present valuable information on entrance requirements, course content and graduate outcomes.

Wed— Aug 19, 1998  
Wed— Nov. 18, 1998  
Wed— May 12, 1999

Where: Building SE2 - Town Square Conference Room  
When: 1830 - 2030  
Register: Call Registration and Information  
at (604) 434-1610 up to one month prior  
to the date you want to attend.

### **Bachelor of Technology in Environmental Engineering Technology**

Join us at these sessions to learn about BCIT's new degree credential in Environmental Engineering Technology. The program head for this degree program will present valuable information on entrance requirements, course content and graduate outcomes.

Wed — Aug 19, 1998  
Wed — Nov 18, 1998  
Wed — May 12, 1999

Where: Building SWI Room 1205  
When: 1830 - 2030  
Register: Call (604) 451-6906 up to one month prior  
to the date you want to attend.

### **Nursing**

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

Mon — Oct 5, 1998  
Mon — Nov 23, 1998  
Mon — Feb 22, 1999  
Mon — Apr 26, 1999

Where: IBM Building - Theatre 233  
When: 1830 - 2030  
Register: Call Registration and Information  
at (604) 434-1610 up to one  
month prior to the date you want to attend.

### **Occupational Health and Safety**

This session will cover all aspects of the Occupational Health and Safety program. Included will be information about class structure, program content, and career information.

Thr — Apr 8, 1999

Where: Building SE2 - Town Square Conference Room  
When: 1830 - 2030  
Register: Call Registration and Information  
at (604) 434-1610 up to one month prior  
to the date you want to attend.

### **Environmental Health Four Year Degree**

These sessions will provide details on the Public Health Inspector/Environmental Health Officer Bachelor of Technology (four-year) Degree program. Join us and learn about the employment possibilities in municipal, regional, provincial and national health agencies, environmental and pollution control agencies and private businesses and industries such as food processing, catering and fisheries.

Thr — Oct 22, 1998  
Thr — Feb 11, 1999  
Thr — Apr 15, 1999

Where: Building SE2 - Town Square Conference Rooms  
When: 1830 - 2030  
Register: Call Registration and Information  
at (604) 434-1610 up to one month prior  
to the date you want to attend.

*Use baking soda for  
scrubbing sinks, bathtubs  
and counters.*



## Women's Work, Women in Technology and Trades

This session will cover all aspects of women entering into non-traditional jobs in the Technology and Trades areas. Included will be information about program content, career information and requirements.

Sat — Jan 30, 1999

Where: IBM Building - Theatre 233  
When: 0900 - 1200  
Register: Call Registration and Information  
at (604) 434-1610 up to one month prior  
to the date you want to attend.

## Financial Aid and Awards

It is important that careful financial planning takes place prior to any decision to pursue post-secondary studies, in order to ensure that enough resources are available to cover all costs. For this reason you are urged to contact the Financial Aid and Awards Office to explore your financial assistance options well before the start of a new school year. Many financial assistance and award programs have early application deadline dates so planning well in advance is to your advantage.

### How Much Will it Cost?

The first step in determining your total financial picture is to calculate expenses and resources. In addition to tuition fees, books and supplies costs, single students not living with their parents can expect to spend approximately \$950 per month on living expenses. Expenses for married students and sole-support parents will be significantly higher. It is important that costs such as rent, food, utilities, transportation, clothing, laundry and entertainment are taken into account. To estimate available resources, you should consider such items as savings, funds from parents, assets such as bonds or term deposits, part-time earnings while attending school, Employment Insurance or WCB benefits and spousal income in the case of married students.

If your estimated expenses exceed your available resources you should consider the government student assistance program available in your home province, state or country. B.C. residents are eligible to apply for the B.C. Student Assistance Program.

### B.C. Student Assistance Program

The B.C. Student Assistance Program (BCSAP) is a joint Program between the Federal and B.C. Governments. Administered by the Student Services Branch of the Ministry of Advanced Education, Technology and Training, BCSAP is the major source of financial aid available to B.C. residents in full-time, post-secondary study. BCSAP is a one application process and is comprised of repayable Canada Student Loan,

repayable BC Student Loan, non-repayable Canada Study Grant for Students With Dependents and non-repayable B.C. Grant. The primary criterion, which determines eligibility, is financial need. A standard procedure is used to compare the applicant's income and resources against moderate living expenses plus basic educational costs (tuition, fees, books and supplies).

The maximum level of awards for the 1997/98 program year are:

\$260 per week for students with no dependents  
\$385 per week for students with dependents

The BCSAP application package is available as of May each year, from Financial Aid and Awards Reception. Workshops are offered each week to help BCIT students complete the BCSAP application correctly.

**Note:** Both federal and provincial governments introduce revisions to their programs each year. Details of changes for 1999/2000 were not known at the time of printing.

### Work Study Program

This program, jointly funded by BCIT and the B.C. Government, provides part-time jobs on campus to a maximum of 10 hours a week for students who have applied for BCSAP and who require more funds than they are receiving as their BCSAP award.

### Entrance Awards Program

**BCIT President's Entrance Awards:** Up to 60 awards equivalent to a full year's tuition will be presented to students entering a full-time BCIT Technology or Trades program (or a formal BCIT transfer program at a regional college) directly from BC Grade 12. To be considered, a student must have applied for admission to BCIT and have submitted a BCIT President's Entrance Award application by April 15. BCIT Entrance Awards packages are distributed to B.C. secondary schools in February of each year.

**BCIT Alumni Association Entrance Awards** provide up to 12 entrance awards equivalent to a full year's tuition to students who are entering a full-time BCIT Technology or Trades program after taking one or more years since secondary school for activities such as work or attending another post-secondary institution.

**BCIT Board of Governors Entrance Awards for Bachelor of Technology** provide up to two entrance awards each year to students entering a BCIT Bachelor of Technology Degree program.

Numerous **Other BCIT Entrance Awards** are available for students entering BCIT, and are detailed in the BCIT Entrance Award package.

A BCIT Entrance Award package, containing the application for all entrance awards, is available from the Financial Aid and Awards Office at (604) 432-8886. Apply early as application deadline dates vary with each entrance award.

### Entrance Awards Program cont.

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## Entrance Awards Program cont.

### Technology Scholarships

Scholarships varying from \$100 to \$2,000 are awarded to Technology students who obtain the highest standing in the first year of their program. No application is necessary. Presentations are made in October of the student's second year. To be eligible for scholarships, a student must carry a 100 per cent course load in first year.

### Other Programs

The Financial Aid and Awards Office also administers a variety of other financial need-based programs and academic merit-based programs for BCIT students, including:

- Fee Deferral Program
- Emergency Loan Program
- Bursary Program
- Technology First Year Achievement Awards
- Technology Graduating Awards
- Trades Training Graduating Awards
- Part-Time Student Assistance Program

### For Further Information

More information on the above programs may be obtained from Financial Aid and Awards Reception, Building SW1-Room 2300. Telephone (604) 432-8555. Office Hours: 0830 to 1600, Monday to Friday.

Offices are closed Saturdays, Sundays and Holidays. Where a BCIT Financial Aid and Awards Office deadline falls on a day when offices are closed, the deadline will be extended to the next working day.

Information provided is accurate at the date of publication but may be subject to change.

#### Staff

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

## BCIT International

BCIT International Office

The office is located in NW1. Tel: (604) 432-8816,

Fax (604) 430-9042, e-mail ietr0100@bcit.bc.ca.

### Administration

Henry Arthur, Executive Director	Tel. (604) 432-8622
Jeanne Kurz, Director	Tel. (604) 432-8968
Sandy Watson, Financial Consultant	Tel. (604) 451-6811
Dorothy Deagle, Financial Assistant	Tel. (604) 432-8969
Karen Wantke, Administrative Assistant	Tel. (604) 432-8966

### International Student Centre

Donna Hooker, Coordinator, International Training Projects  
 Tel. (604) 432-8842  
 Lexie Atherton, International Student Advisor  
 Tel. (604) 432-8475  
 Jackie Blazevic, International Student Advisor  
 Tel. (604) 432-8965  
 Chad Monsma, International Assistant  
 Tel. (604) 432-8816

### International Projects

Margaret Neylan, Health Specialist  
 Tel. (604) 432-8583  
 Rhett Wade, Technical Training Specialist  
 Tel. (604) 451-7070  
 Rae Kerr, Trades Specialist  
 Tel. (604) 451-7015  
 Pauline O'Neill, Project Management Specialist  
 Tel. (604) 432-8964  
 Ernesto Calica, Consultant  
 Tel. (604) 432-8983  
 Bill Bradbury, Consultant  
 Tel. (604) 432-8721  
 Angela Ferrarro, Project Assistant  
 Tel. (604) 432-8322

### International Student Centre

BCIT's international students come from many different cultural backgrounds and from virtually every point on the globe. International education plays a strong role at BCIT. The philosophy of BCIT International is to:

- Provide quality programs that will prepare international students and new permanent residents for academic success
- Assist international students and new permanent residents with their integration into BCIT and surrounding community

Several programs have been designed to meet the specific needs of our international students and new permanent residents.



International applicants/students are defined as having a permanent residence outside Canada. For those international applicants who do not meet the English language requirements for BCIT programs, BCIT International offers special programs, which are designed to integrate technical training with English language development. The programs offers students an opportunity to develop practical skills and earn credits while continuing to develop their English language skills. Graduates of these programs can immediately put their new skills to work or they can transfer their credits to BCIT regular programs.

The following programs have been developed specially for international students and are administered by BCIT International's International Student Centre:

### Interior Design Program (IDP)

This 12-month, three-term program combines English language training with an introduction to residential Interior Design preparing students for careers in design offices, retail stores or industry suppliers featuring residential or office design. Students who successfully complete this program can enrol in the senior certificate program offered by BCIT. Alternatively, students who have successfully completed this program will possess a portfolio they can use for applying for work of further study programs.

Prerequisite: High school completion and TOEFL 500 or equivalent.

The Interior Design program is held at BCIT's Downtown campus located in the heart of Vancouver's Business District.

**Fees:** \$200 Application fee  
\$3,900 tuition each of three terms

Program Content: Courses are 6-12 weeks delivered over three consecutive terms. Completion of all courses leads to a Management Certificate in Interior Design. Intakes are in September and January.

- Basic Interior Design
- Drafting I
- Materials
- Color and Lighting
- Introduction to Computers
- Drafting II
- Space Planning I
- History of Furniture
- AutoCAD I
- AutoCAD II
- Space Planning II
- Graphic Presentation
- Detailing and Construction
- Business Practices
- Directed Studies
- Technical Communications

### Academic Business Program

The ABP program is a two term, eight-month program offered in partnership with a local language college. This program is perfect for students who wish to develop English language skills while earning credits in Business. Term 1 of the program is located at the Vancouver Maple Leaf Language College and offers intensive English for College preparation. Term 2, located at BCIT in Burnaby continues intensive English and adds five credit courses related to Business.

Prerequisite: High school completion and a TOEFL score of 450. Direct-entry to term 2, TOEFL 513 or equivalent. Intakes are in September, January and May.

**Fees:** \$200 Application Fee  
\$3,400 Term 1 tuition  
\$200 Registration Fee  
\$3,900 Term 2 tuition

### Program Content

#### Term 1 (held at Vancouver Maple Leaf Language College)

- Advanced English
- Academic Study Skills
- Business Communications

#### Term 2 (held at BCIT's Burnaby campus)

- Introduction to Business
- Introduction to Computing
- Accounting I
- Effective Public Speaking
- Business Mathematics
- Introduction to BCIT for English as an Additional Language Students

### Business Management Studies

This program offers the second language student an opportunity to develop their English language skills to BCIT's standard while also earning credit in business courses. The length of the program is dependent on the students' entry term and English improvement. After successful completion of the program, students can apply to Level 2 of many BCIT Business diploma programs. Successful students will be in an excellent position to transfer credits toward BCIT business diploma programs and/or to other Canadian or U.S. institutions. Pre-requisite: High school completion and a TOEFL score of 513 or equivalent.

*continued next page*

## Business Management Studies cont.

### Term 1 (held at BCIT's Burnaby Campus)

- Introduction to Business
- Introduction to Computing
- Accounting I
- Effective Public Speaking
- Business Mathematics
- Introduction to BCIT for English as an Additional Language (EAL) Students
- Technical English/Second Language Students \*offered to students on successful completion of the "EAL" communications course

### Term 2

- Management
- Microeconomics
- Accounting 2
- Essentials of Marketing
- Introduction to Communication and Language Skills

**Fees:** \$200 Application fee  
\$3,900 tuition each of two terms

Additional services to International students (note, some involve a fee):

- Accommodation assistance
- Airport reception and departure
- Orientation
- Registration
- Medical insurance
- Social, cultural and immigration assistance

## International Projects

In addition to offering instruction to international students while in Canada, the department of 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 a variety of courses or 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.

## 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 towards 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.*

### Trades Discovery for Women

This full-time program is designed to prepare participants to successfully enter and complete a Trades Training program.

For information about the Trades Discovery for Women program, please refer to page 52 of this calendar.

### Personnel

Anne St. Eloi, Coordinator, Women in Trades

Tel. (604) 432-8233

Mahara Sinclair, Instructor, Women in Trades

Tel. (604) 451-7160

Lisa Moy, Instructor, Women in Trades

Tel. (604) 412-7457

### 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 Tuesday afternoon at 1230 in SWI Room 126, Registration and Information. For more information call (604) 432-8555.

### Special Training Programs

BCIT Trades Training 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. In 1995 BCIT provided the Trades Training for Pre-Trades Exploratory for Aboriginal Women and Trades Discovery for Women, Aluminum Vessel Construction for Women Program, which trained 24 women welders in 1996 and 1998.

### Dean's Advisory Committee on Equity

A committee of people both internal and external to BCIT has been established to advise the dean 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 (604) 688-9499/(519) 453-2105.

Lower Mainland WITT meets the second Monday of the month (no meetings July and August).

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## BCIT Libraries

The BCIT Libraries include the Burnaby Campus Library and specialized branch libraries at Pacific Marine Training campus and Sea Island campus.

The libraries play 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 **Burnaby Campus 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 **PMTC Library** collection specializes in nautical, marine engineering, marine emergency, radar simulator, and ship operations materials.

The **Sea Island Campus Library** collection specializes in aircraft maintenance and repair and avionics materials.

The library has the latest in computerized information including a new Library Catalogue System, Internet, and in-house CD-ROM access. The Microcomputer Centre on the Lower Floor is available for student use. The libraries are wheelchair accessible and have special needs facilities such as a print-to-voice machine for the visually challenged. These are your libraries. Use them for your information needs.

### Library Hours

**Burnaby Campus Library** (604) 432-8557  
September to May (subject to change)  
Monday to Thursday: 0730-2230  
Friday: 0730-1700  
Saturday and Sunday: 0900-1700  
Circulation Desk: (604) 432-8370  
Reference Desk service: (604) 432-8371

**PMTC Library** (604) 985-0622 ext. 343  
Monday to Friday: 0800-1600  
Closed Tue. and Thr.: 1300-1400

**Sea Island Campus Library** (604) 278-3519  
Monday to Friday: 0800-1600  
Closed daily: 1230-1330

### Internet Access

The library's homepage is available at <http://www.lib.bcit.bc.ca>. Be sure to visit this site for more detailed information about BCIT Libraries and services, the new Library Catalogue System as well as the many resources and links that we have to offer.

### 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 - Health/Distance Education Services  
Jim Gormican, M.L.S., Reference - Manufacturing and Processing  
Frank Knor, Dipl.T., B.Ed., B.L.S., M.L.S., Coordinator, Systems and Computing, Reference - Electrical  
Merilee MacKinnon, B.A., M.L.S., Reference - Construction Trades and Technologies  
Linda Matsuba, B.Ed., M.L.S., Reference - Business  
Tony O'Kelly, B.A., M.L.S., Coordinator, Information Services, Reference - Computer and Academic Studies  
Rob Roy, B.A., M.A., B.L.S., Coordinator, Acquisitions and Serials, Reference - Transportation

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## Medical Services

A drop-in medical office, located in the Student Activity Centre SE16, 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. Services include immunizations, some free medications, STD (sexually transmitted disease) information and testing, pregnancy tests, pap test, ice bags and tensors, bandages, crutches and canes, blood pressure checks, literature on numerous health issues and beds for resting.

A psychiatrist and physiotherapist are also available. Referral to the psychiatrist 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.

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## Medical Services cont.

### 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:  
**Location:** 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 giving precise location of patient;
  - (ii) Call ambulance at 911;
  - (iii) Call security at (604) 451-6856 (24 hrs.), give location of patient.
- b) If patient is mobile, escort to first aid attendant in Building NE16.

### When first aid attendants are not on duty:

If medical treatment is required, call ambulance at 911.

### Sea Island campus - Hours

0800-1600 Monday to Friday.

### PMTCC campus - Hours

0800-1630 Monday to Friday.

## Childcare

The BCIT Childcare Centre opened September, 1990, and serves 25 children, ages 2½ to five, with the majority of spaces 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 three to five as well as a toddler centre to serve children aged 18 months to three years. Long-term goals for the year 2000 include additional centres for drop-in and flexible care.

The Institute and the Student Association are pleased that this important service is available to our students. For more information on the Childcare Centre, please call (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

Web site: [www.bcit.bc.ca/~housing](http://www.bcit.bc.ca/~housing)

### 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 of Residence Accommodation

The cost of a room at Maquinna Residence in 1998/99 was \$370 per month. This does not include meals, as students do their own cooking. Cost is subject to change.

### How to Apply for Residence

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 maintains a free listing service of local, short-term and long-term accommodation. General information, area maps and a free local telephone are available to students seeking accommodation.

Listings for long-term, off-campus accommodation (e.g. more than three-four months) are posted at the Housing Office for viewing during office hours. The current listings cannot be mailed, but are available on the BCIT Housing department WEB page at: [www.bcit.bc.ca/~housing/offcamp.htm](http://www.bcit.bc.ca/~housing/offcamp.htm).

Costs for off-campus accommodation vary according to the type and location you select. Average monthly costs in 1998 were approximately:

Room and Board	\$550
Room with Cooking Facilities	\$350
Basement Suites (one bedroom)	\$450
Apartments (one bedroom)	\$550
Shared accommodation	\$400

Short term accommodation listings can be mailed or faxed upon request. Call the Housing Office at (604) 432-8677 to receive a copy.

Please note that BCIT does not assume any responsibility for agreements made between students and landlords.

## Family Housing

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

Campus Cafe (SE12)	
Monday to Thursday	0700-2100
Friday	0700-1700
Saturday	0800-1430

Town Square Cafe, (SE2)	
Monday to Thursday	0630-2100
Friday	0630-1530
Saturday	CLOSED

E.T.C. Building (SE1)	
Monday to Friday	0700-1430
Saturday	CLOSED

Road Runner (SW1, Room 2322)	
Monday to Thursday	0730-2100
Friday	0730-1530
Saturday	CLOSED

J.W. Inglis Building (NE1)	
Monday to Thursday	0630-2100
Friday	0630-1530
Saturday	0800-1400

## Food Services

Campus Cafe (SE12)	
Monday to Thursday	0700-2100
Friday	0700-1600
Saturday	0800-1430

Town Square Cafe, (SE2)	
Monday to Thursday	0630-2100
Friday	0630-1500
Saturday	CLOSED

E.T.C. Building (SE1)	
Monday to Friday	0700-1430
Saturday	CLOSED

Road Runner (SW1, Room 2322)	
Monday to Thursday	0730-2100
Friday	0730-1500
Saturday	CLOSED

J.W. Inglis Building (NE1)	
Monday to Thursday	0630-2100
Friday	0630-1530
Saturday	0800-1400

Hours of operation may be adjusted according to academic calendar.

Each Cafeteria has its own feature; be it Subway at Campus Cafe, Pacific Wok at the Town Square, Starbucks at Inglis and much more.

## 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.

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 for the Physically Challenged

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

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## Parking cont.

### Parking Rates

Day Students		
Monthly		\$15
Semester:	Sep 1 - Dec 31	\$60
	Jan 1 - May 31	\$75
<b>Night School</b> (term)		\$16
<b>Physically challenged</b> (monthly)		\$15
<b>Motorcycle</b> (monthly)		\$7
Semester:	Sep 1 - Dec 31	\$28
	Jan 2 - May 31	\$35
Daily (ticket dispenser)		\$1.50
Visitor (one hour limit)		\$1.50
Visitor SE14 Lot Only (all day)		\$6

### Parking Violations

- 1st violation, \$20 fine; (reduced to \$15 if paid within 72 hours);
- 2nd violation, \$20 fine plus tow warning (Fine reduced to \$15 if paid within 72 hours);
- 3rd violation, \$20 fine plus tow at owner's expense unless previous ticket paid. (Fine reduced to \$15 if paid within 72 hours.).

### Immediate Impoundment

A vehicle will be towed in the first instance when:

- blocking fire lanes, roadways, fire hydrants, yellow curbs, other vehicles
- parked in Campus Square
- displaying a fraudulent permit
- or otherwise impeding the normal traffic/pedestrian movement

### 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, seven days a week. Security is responsible for:

- Safe-walk-escorts, call Security at (604) 451-6856
- Locking and unlocking schedules
- 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 SkyTrain 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 Services

Get a jump on your search for work – register early for the BCIT Works! Jobsline and Ejobs. Check out our job board regularly too. Take advantage of our resume review service, resume faxing, work search resources and computer kiosks for resume writing and Internet work search.

### BCIT Employment Services

SW1 1100

Tel: (604) 432-8666; fax (604) 435-3122

email: bciteps@bcit.bc.ca

Open Monday-Friday 0830-1600. Closed 1300-1400.

## 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 Labor 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 labor 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 per cent 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.

## 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 are included.

### Hours of Operation September-May:

Monday to Thursday	0630-2300
Friday	0630-2100
Saturday	0900-1700
Sunday	0900-1700
June-August:	0730-2100 (Mon – Thr)
	0730-1630 (Fri)
	Closed Weekends

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.

### 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.

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## Recreation and Athletics cont.

### 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.

### 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, 3 on 3 basketball, ultimate frisbee, 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.

### Aerobic Fitness Classes

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

### Special Events

Throughout the year, we schedule special events for students and staff to promote fitness and social activities. Thanksgiving Turkey Shoot is a popular fall event and the Quintathlon is our major spring 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.

## 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 (Racquet Court Bookings)

Tel. (604) 432-8612.

## Student Association

3700 Willingdon Ave,  
Burnaby, B.C. V5G 3H2  
Tel: (604) 432-8600 Fax: (604) 434-3809

### Student Government

Elections for the Student Association are held in the Spring each year. BCIT students are invited to run for the following positions: President, VP Public Relations and Marketing, VP Finance and Administration, VP Student Affairs, Campus Life Coordinator, Chairperson of Trades, Chairperson of Business Society and Health Sciences Society, Chairperson of Electrical and Electronics Society and Computer Information Society, Chairperson of Information Society, Chairperson of Transportation Society and Construction Society, Chairperson of Manufacturing and Mechanical Society and Processing, Energy, Renewable Resources Society.

### Student Representation

Students are represented on the following Institute committees: Board of Governors, Alumni Association, Harassment and Discrimination, Health and Safety, Multiculturalism, Computer Resources, Education Council and many others.

### The Student Association Campus Centre Building

The S.A. Campus Centre provides centrally located study, meeting and retail space. The building has been a dream of students since 1979 and is 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.

## Recreation

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

## Copy Centre

The Student Association Copy Centres offer full Cerlox binding service, fax service, laminating, recycled paper, colored and high grade bond papers, student identification and self service copiers located throughout the campus. Tel: (604) 451-7039.

## Lease/Management Operations

Several services at BCIT are available through lease and management agreements: Scholastic Insurance, Campus Travel Agency, Dukes' Cappuccino and Cookie Bar, The Brown Bag Restaurant, Elephant on Campus Student Pub and Sooky's Cappuccino.

## 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. They include everything 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) 451-7041.

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
- Dukes Cappuccino (SE16)
- This 'n That Stores (NE1, SW1, SE12)
- Student Assist. Fund
- Recreation (SE16)
- Brown Bag Rest. (NE30)
- Childcare (SW7)
- The Link
- Vending Operations
- Copy Centre (SE14)
- Desktop Publishing (SE14)
- Scholastic Insurance

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## Banking

The Canadian Imperial Bank of Commerce provides an Instant Teller Machine with Interac Network, at the entrance to Building SE2 first floor.

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## Lockers

Lockers at BCIT are available to students on a first-come basis. 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. Lockers are the property of BCIT with BCIT reserving the right to inspect lockers at their discretion.

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## Changes to Curricula, Regulations and Services

BCIT is presently undergoing a significant number of program revisions in an attempt to provide a better focus on programs. Although BCIT proposes to adhere to the programs of study set forth in our publication, the Institute reserves the right to make, without prior notice, whatever changes are deemed necessary to the programs of study, courses, services or regulations. The Institute reserves the right to cancel any program or service.

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## Lost and Found

Please refer enquiries to Safety and Security Building SW1, Room 1001, 24 hours a day.

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## Alumni Association

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'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 Association also assists with organizing reunions and offers group life insurance.

The Alumni Office is located in the new Student Association Campus Centre.

Tel. (604) 432-8847, Fax (604) 431-8911,  
e-mail [alum0001@bcit.bc.ca](mailto:alum0001@bcit.bc.ca).



# Preparatory Programs

## Engineering Technology Entry (ETE)

This full-time, day school program provides academic upgrading to students who wish to enrol in Engineering, Electronic and Health Science programs at BCIT.

The ETE program provides courses in chemistry, communication, mathematics and physics that meet program prerequisites in selected technology programs at BCIT. The program also includes an introductory course in computer applications and a general interest seminar course.

Students may choose not to take either the physics or the chemistry course if that course is not a prerequisite for the program in which they plan to enrol, but are expected to take all other courses in the program. All ETE courses accept some Part-time Studies enrolment, space permitting. This full-time program is designed to emulate the workload of subsequent programs, familiarize the student with BCIT and provide academic and study skills to enable a student to succeed in subsequent programs.

Some 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 ETE may be provisionally accepted into an Engineering, Electronic, or Health Science program in a subsequent term, subject to satisfactory completion of the ETE program with marks equivalent to program prerequisites. Marks required vary with the 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. Provisional acceptance may be decided by some programs on a case-by-case basis. Additional course work outside the ETE program and/or personal interviews may be required before provisional acceptance is offered. There are annual enrolment limits for programs that 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 their first program choice.

### 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.

### Entrance Requirements

English 11 (C) Math 11 (C). All entrance requirements for this program must have been completed within eight years of application date. Depending on the Technology program the student wishes to enter following ETE, specific grade requirements will need to be achieved in ETE courses. 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 enrolment limits for programs that 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.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

### Faculty and Staff

Kent Yakel, B.Sc. (Hons), M.Sc., Associate Dean  
Michele Hemphill, B.S.Sc., P.Eng. Program Head  
Janna Seto, Program Secretary

### 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.

## Fresh Start

This full-time 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 test for trades and who are 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 usually offered twice a year with intakes in September and February. Once a student becomes acceptable into the Fresh Start program, he/she is then placed on the waitlist for their selected trades/technician program.

For further information on the Fresh Start program, please call the department at (604) 451-6832 or visit the department's home page at <http://www.bcit.bc.ca/~sott/freshstart/>

### Program Length

Full-time, 19 weeks.

### Normal Course Hours

0800-1500, Monday through Friday.

*continued next page*

## Fresh Start cont.

### Tuition Fees 1999/2000 (subject to change)

\$667.85 for the 19-week program.

### Books and Supplies 1999/2000

\$344 (general estimated cost and subject to change).

### Entrance Requirement

This program will accept students who have written the BCIT pretest for Trades and who are within at least two grade equivalents from the entrance requirements for entry into their desired Trade program.

### Moving From Fresh Start into a BCIT Trades Program

Many students attend the BCIT Fresh Start program as a method for meeting entrance requirements into a BCIT Trades program. To ensure your application is correctly completed please follow these instructions:

1. When applying for the Fresh Start program applicants must also indicate which follow-up trades program they wish to attend after they complete the Fresh Start program.
2. On successful completion of the Fresh Start program, applicants will be placed on a "waiting list for seat availability" for their follow-up trade program. The date used will be the date the applicant became "complete and acceptable" for entrance into the Fresh Start program.

### Instructors

Francis Atkinson, fatkinso@bcit.bc.ca  
Ewan Sheard, Chief Instructor, esheard@bcit.bc.ca

## Technology Entry with English Language Training Program (TEWELT)

This program runs concurrently with the ETE January intake. Computer literacy, math and physics lectures are common courses with ETE, but TEWELT has its own extended communication course, which focuses on skills needed for students who require English language training. It also features team teaching between communication and physics, related to lab write-ups to further strengthen communication skills. TEWELT has the same basic access availability to Engineering, Electronic, and Health Science programs as the ETE program.

Both ETE and TEWELT are eligible for student assistance funding. For additional information about the ETE and TEWELT programs, call BCIT Registration and Information at (604) 434-1610 or toll free at 1-800-667-0676, Monday to Friday, 1300-1600.

### Faculty and Staff

Kent Yakel, B.Sc. (Hons), M.Sc., Associate Dean  
Michele Hemphill, B.A.Sc., P.Eng, Program Head  
Janna Seto, Program Secretary

## Trades Discovery for Women

This full-time program is designed to prepare participants to successfully enter and complete a Trades Training program. On completion the women will be able to evaluate their suitability for working in the trades, determine a trade they wish to pursue, work safely in the shop and on a construction site, use hand and power tools, and participate effectively in Trades Training at BCIT. For further information on the Trades Discovery for Women program please contact Anne St. Eloi, Coordinator, Women in Trades/Special Initiatives at (604) 432-8233.

### Grading

Grading Mode - S/U (Satisfactory/Unsatisfactory)

### Program Length

Full-time, 20 weeks.

### Normal Course Hours

0730-1430, Monday through Friday.

### Tuition Fees 1999/2000 (Subject to Change)

\$703 for the 20-week program.

### Entrance Requirement

High school graduation or GED. BCIT pretest is acceptable for Math and English. Interview with the department is required.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

### Program Content

Courses	Hours
TEXP 0010 Program Orientation	6
TEXP 0011 Personal and Career Assessment I	2
TEXP 0017 Master Student	6
TEXP 0019 Employability Skills	138
TEXP 0021 Job Shadowing/Industry Tours	108
TEXP 0022 Introduction to Hand and Power Tools	12
TEXP 0023 Trade Specific Skills	276
TEXP 0024 Applied Math	30
TEXP 0025 Lift Truck Training/Certificate	12
<b>Total</b>	<b>600</b>

### Instructors

Lisa Moy, lmoy@bcit.bc.ca  
Mahara Sinclair, msinclair@bcit.bc.ca

Orientation to individual trades taught by qualified journeypersons.

*They ask for our grads by name*

# Bachelor of Technology

**BCIT offers or plans to offer the following Bachelor of Technology Degree programs in:**

- Accounting  
(for details see page 60)
- Computer Systems  
(for details see page 95)
- Environmental Engineering Technology  
(for details see page 109)
- Environmental Health (four year, entry-level, full-time)  
(for details see page 154)
- Medical Imaging  
(for details see page 159)
- Specialty Nursing  
(for details see page 171)
- Management  
(for details see page 76)
- Manufacturing  
(for details see page 176)

- Construction Management  
(for details see page 107)
- Electronics (intended implementation January 2000)
- Geomatics/GIS (intended implementation January 2000)
- Process Systems Integrated Management (proposed)
- Forensic Science (proposed)
- General Nursing (proposed)
- Integrative Medicine (proposed)

Unless otherwise noted above, all Bachelor of Technology programs are offered on a part-time basis and require a relevant BCIT Diploma or equivalent, English 12, and two years of relevant work experience.

The Bachelor of Technology in Environmental Health is offered as a four year degree through full-time studies. Admission is based on a number of criteria including specific high school courses.

Bachelor of  
Technology



## Full Credit Courses Without The Campus Headaches.



At the Open University and Open College, you get all the benefits of a traditional education without the hassles. As a fully accredited college and university, we offer a complete range of courses, certificates, diplomas and degrees in everything from business, health and human services to arts and science. And with our on-line computer conferencing, print and video based courses, and personal tutoring you can study where and when you want. No waiting lists. No time conflicts. And no traffic jams.

So what are you waiting for? Whether you want to get a business diploma, earn a degree, or take a university transfer course, we can give you the education you need to enhance your life, without sacrificing your lifestyle.

For more information call 431-3300 in the Lower Mainland or  
1-800-663-9711 within B.C.

  
SERVICES OF THE  
OPEN LEARNING AGENCY

E-mail: [studentserv@ola.bc.ca](mailto:studentserv@ola.bc.ca) Internet: [www.ola.bc.ca](http://www.ola.bc.ca)



# Academic Studies



Academic Studies

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## General Description

The Academic Studies Division provides courses, essential to many technological programs at BCIT, in Chemistry, Communication, Mathematics, and Physics. Academic upgrading courses and the Engineering Technology Entry program (ETE) are offered to prepare individuals for their work in two-year diploma programs at BCIT.

## Administration

Ken Takagaki, B.A.(Hons.), C.M.A., C.D.P., Ph.D., Dean  
 Kent Yakel, B.Sc.(Hons.), M.Sc., Associate Dean,  
 Academic Studies  
 Suzanne Geddes, B.A., B.Sc., Operations Manager  
 Pam Curtis, Secretary

### Computer Systems Technology

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

## 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 full-time, day school program provides academic upgrading to students who wish to enrol in engineering-based programs at BCIT.

Academic studies courses are offered throughout the year in many formats:

- 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 Registration and Information at (604) 434-1610.

## Special In-house Communication Courses

All BCIT Communication courses can be delivered in-house for interested groups in three-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.

For more information about other preparatory programs at BCIT, please refer to page 51 of this calendar.

## 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 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 Health Sciences and Engineering Technology. Also for Electrical and Electronic Technology.
- Effective Writing and Independent Learning Skills -  
Preparation courses for every technology.
- Comprehensive Reading, Writing and Learning Skills -  
Preparation courses for every technology and BCIT equivalent of English 12 for every technology.



- Technical English as a Second Language - Equivalent to BCIT's English Language requirement for second language students.
- Chemistry - Chemistry I I.
- Physics - Physics I I.

### Financial Assistance

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 BCIT Registration and Information at (604) 434-1610.

### Chemistry On-Line Resource Centre

(<http://nobel.scas.bcit.bc.ca/resource/>)

The BCIT Chemistry Resource Centre is a Web site that is available to those who wish to assess their Chemistry knowledge or upgrade their Chemistry skills. Try the on-line assessment test and interactive problems at this site. Programs that require first-year Chemistry assume students to have this level of Chemistry knowledge. There are direct textbook references made to topics in General Chemistry and many interesting WWW Science links. A CD-ROM version of the Resource Centre that includes more interactive assessment exercises is also available for purchase at the BCIT bookstore.

### Faculty and Staff

#### Chemistry Department

Kevin Hoy, B.Sc. (Hons), Ph.D., Program Head  
 Pamela 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 Bicho, Dipl.Tech.  
 Cheryl Heady, Dipl.Tech.  
 Yvonne Manson, Dipl. Tech.  
 Tim Mephram, M.Sc., C.Chem., M.R.S.C.  
 Marilyn Pickering, C.Tech., A.S.T.T.  
 Shirley Reynolds, B.A. (Hons.), M.Sc.  
 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

Nargis Abraham, Ph.D., Program Head, Pre-Entry  
 Dennis Johnston, B.Ed., Program Head, Administration  
 Michael Otte, B.A. (Hons.), M.A., Program Head,  
 Curriculum and CE  
 David Vale, B.A., B.Ed., M.Ed., M.B.A., Program Head,  
 Personnel  
 Judy Beresnak, secretary  
 John Adames, B.A., M.A., Ph.D.  
 Rider Cooley, B.A. (Hons.)  
 Clark Cook, B.A. (Hons.)  
 Thorsten Ewald, B.A., M.A.  
 Dale Fitzpatrick, B.Journ., M.A.  
 Linda Hale, B.A., M.A.  
 David Hamilton, B.Sc.  
 Sharon Helgesen, B.A., Cert. Adult Literacy  
 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, Dipl.T., M.A.  
 Jennifer Nachlas, B.A. (Hons.), M.A., Ph.D.  
 Bill Oaksford, B.A., M.A.  
 Linda Pashka, M.A., Ph.D.  
 Lorraine Robson, B.A., M.A.  
 Frank Schnurr, B.A., M.A.  
 Jean Scribner, B.A., M.A.  
 Kathy Vance, B.A. (Hons.), M.A., Ph.D.  
 Susan Woo, B.Sc., Dipl. Ed.

#### Mathematics Department

Louise Routledge, B.A., B.Ed., C.Q.E., Program Head  
 Judy Beresnak, Secretary  
 Ross Bradbeer, B.Sc., M.Sc.  
 Graham Cocksedge, B.Sc.For., M.Eng.  
 Erika Crema, B.Sc.(Hons), F.C.S.T.  
 Stela Dumitrescu, B.A.Sc., M.Sc.  
 Andy Ellingsen, B.Sc.  
 Michele Hemphill, B.A.Sc., PEng.  
 Eric Hiob, B.Sc., M.Sc., Ph.D.  
 Peter Hobbins, B.Sc.  
 Colin Lawrence, B.Sc. (Hons.)  
 David Sabo, B.Sc. (Hons.), M.Sc., Ph.D.  
 Val Sawadsky, B.A., B.Sc. (Hons.)  
 G. John Smith, B.Sc., M.A., Ph.D.  
 Jim Waterman, B.A.Sc. (Hons.), M.A.Sc.  
 Tony Webb, B.A., M.Sc., Ph.D.

*continued next page*

## Academic Studies Division cont.

### Faculty and Staff

#### Physics Department

Donna MacDuff, B.Sc., Cert.Ed., Program Head

Pamela Curtis, 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.

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.

Randall Woods, B.Sc., M.Sc., M.A.Sc.

## Engineering Technology Entry (ETE)

This full-time, day school program provides academic upgrading to students wishing to enrol in Engineering, Electronic and Health Science programs at BCIT.

For information about the ETE program, please refer to page 51 of this calendar.

## Technology Entry with English Language Training Program (TEWELT)

This program runs concurrently with the ETE January intake. Computer literacy, math and physics lectures are common courses with ETE, but TEWELT has its own extended communication course, which focuses on skills needed for students who require English language training.

For information about the TEWELT program, please refer to page 52 of this calendar.

### Faculty and Staff

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

Michele Hemphill, PEng., Program Head

Janna Seto, Program Secretary



# Business



*“BCIT’s intensive journalism program taught me the importance of the word “deadline”. Extensions are not an option in the news industry, whether you’re reporting or producing a talk show, and they weren’t an option at BCIT.”*

*~ Carolyn Haarer, Producer  
The Rafe Mail Program,  
Broadcast Journalism Graduate*

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## Administration

### Office of the Dean

Gordon Farrell, Dipl.T., M.B.A., F.C.M.A., Dean,  
Tel. (604) 432-8218

Jennifer Wilkinson, Administrative Assistant,  
Tel. (604) 432-8598

Dale Hunter, Dipl.T., B.A., Operations Manager,  
Tel. (604) 432-8575 Fax: (604) 436-0810

### Program Responsibilities

Advanced Studies in Business (Degree Completion)  
Business Administration Post Diploma Program  
Human Resource Management Post Diploma Program  
Human Resource Management Diploma Program  
Management Bachelor of Technology Program  
Management Systems Diploma Program

### Broadcast Communications

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

### Financial Management

Dick Dolan, B.B.A., M.B.A., Associate Dean,  
Tel. (604) 432-8894 Fax: (604) 439-6700  
Advanced Accounting  
Corporate Finance  
Financial Planning  
Microfinancial Systems  
Professional Accounting  
Taxation  
Bachelor of Technology in Accounting

### Marketing Management

Mike Powley, B.Ed., M.B.A., Associate Dean  
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 and Transportation  
Operations Management  
Applied Operations Management Senior Certificate

## Accounting

### Bachelor of Technology (Part-time)

#### Introduction

The Bachelor of Technology in Accounting degree has been structured on a degree-completion basis with BCIT's Financial Management diploma as the foundation. Applicants who have taken courses at other post-secondary institutions or from the professional accounting bodies will be individually assessed and a program of studies will be designed to meet their needs. This degree is being introduced at a time when the accounting profession is moving towards making a degree a mandatory prerequisite to the awarding of a professional designation. The CA's already require a degree and the CGA's and CMA's have announced their intention to do so. BCIT is working in partnership with the professional accounting bodies to ensure a smooth fit between the Accounting degree program and the professional programs.

BCIT's Bachelor of Technology in Accounting will be available on a flexible part-time basis so that students can work and study at the same time. It will provide graduates with an academic credential leading to a professional accounting designation or to an MBA program. Students will acquire the key technical, interpersonal, communication, problem-solving and computer skills demanded by employers. They will also learn to work in teams, which is becoming an increasingly important ability in the workplace. The liberal education courses, which form an important element of the program, will provide graduates with the broad perspective required in a rapidly changing business environment.

#### Entrance Requirements

1. BCIT Financial Management Diploma or equivalent with an average of at least 70 per cent
2. English 12 or equivalent

#### Registration Procedures

Individuals interested in applying for entry into the Bachelor of Technology in Accounting program should complete a BCIT Bachelor of Technology Application Form and send it to the BCIT Admissions department.

An interview with the program head is required either before or after submission of the official Application Form. Contact the program assistant at (604) 432-8609 to arrange for an interview.

Twelve credits of Liberal Education courses are required. Courses which have already been completed at Canadian institutions will be automatically assessed by the Registrar's Office in response to an official application. Courses taken outside of Canada must be assessed by the Open Learning Agency. (Ask the program assistant for detailed instructions).

Courses to be offered each term will be advertised in the BCIT Part-time flyer. Candidates should be aware that they may complete a maximum of six credits of Bachelor of Technology level course work prior to acceptance into the Degree program.

Candidates are required to complete the Bachelor of Technology in Accounting within six years.

### Program Structure

1. Up to 20 credits of Technical Core Courses may be required, depending of the student's background (to be determined by the program head)
2. 28 credits of Advanced Technical Specialty Courses (see below)
3. 12 credits of Liberal Education courses
4. Two years of relevant work experience.

### Advanced Technical Specialty Courses

Courses	credits
Required Courses (both courses must be completed):	
FMGT 7910 The Business Environment	3.0
FMGT 8910 Integrative Business Management Practices	6.0

Students must complete 6 courses from those listed below:

FMGT 7121 Advanced Accounting	4.0
FMGT 7210 Advanced Management Accounting	3.0
FMGT 7310 Advanced Auditing	3.0
FMGT 7410 Taxation of Close Corporations	3.0
FMGT 7510 Advanced Finance	3.0
FMGT 7710 Management Information Systems	3.0
FMGT 8120 Accounting Theory	3.0

### Required Equipment

All students are required to have access to a computer with a modem. Detailed specifications are available from the program head.

### Additional Information

For more information about BCIT's Bachelor of Technology programs, please see page 53 of this calendar.

For the most current information package on the Bachelor of Technology in Accounting, please contact:

Margaret Briscall, B.Com., M.B.A., F.C.M.A.  
Program Head, Accounting Degree  
Financial Management Department  
Telephone (604) 432-8786 E-mail: mbriscal@bcit.bc.ca

Jean Covell, Program Assistant  
Financial Management Department  
Telephone (604) 432-8609 E-mail: jcovell@bcit.bc.ca

Ruth MacKay, Program Assistant  
Financial Management Department  
Telephone (604) 412-7417 E-mail: rmackay@bcit.bc.ca

## Advanced Studies in Business

### Degree Completion Program/Bachelor of Business Administration granted by the Open University (OU) (Full-time and Part-time)

Provides BCIT Business diploma graduates with additional educational opportunities to meet the needs of B.C. business, government and industry for more highly trained management generalists, through a program leading to a Bachelor's degree in Business Administration.

### Degree completion

The Open Learning Agency (through its Open University), collaborates with BCIT to offer degree completion programs. The Open University (OU) grants BCIT Business diploma graduates a block transfer of up to 72\* credits toward the Bachelor of Business Administration degree. BCIT graduates generally need to complete at least 48 credits at BCIT, the OU, or other institutions to meet the Open University degree requirement of 120 credits. For additional information on credit transfer for these and other diploma programs please contact OLA's Student Services at (604) 431-3300.

\* Credit transfer depends on which BCIT diploma program was taken, when the student graduated and the date when the student applies to the OU for program plan approval and the student's overall diploma GPA. Students may receive additional credit for courses taken at other institutions.

### BCIT admission and registration procedures for the Bachelor of Business Administration degree offered in collaboration with the Open University

These procedures apply to BCIT Business Diploma graduates who wish to embark on the Open University's Bachelor of Business Administration degree completion program, granted by the Open University in collaboration with BCIT.

#### I. Apply to the Open University

The Open University is responsible for reviewing the student's academic record from BCIT and any other post-secondary institution the student has attended, to determine the amount of credit that will be awarded toward the degree. This critical first step tells the student what courses they require to earn the degree. Contact OLA's Student Services at (604) 431-3300 for a complete information package containing admissions instructions.

*continued next page*

## Advanced Studies in Business cont.

### 2. Apply to BCIT

To apply, submit an application for admission (please designate if you wish to attend on a full-time/day school or part-time/night school basis) together with a copy of your Open University approved program plan (sent to applicant approximately six to eight weeks after step 1) 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:

- academic performance in your BCIT Diploma program;
- a 200-word statement indicating your reasons for choosing the program;
- 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.

Applications for part-time enrolment in the degree completion program for diploma graduates may be made at any time.

### 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 flyer to determine which courses are available. Courses are normally offered in the spring/summer, winter and fall terms.

The liberal arts requirements may be met by arts and sciences courses taken through the Open University by distance education, or other accredited universities and colleges with a letter of permission from the OU. The advanced business courses are offered at BCIT and through the OU. Additional business courses can usually be taken at BCIT to meet requirements established in your program plan.

### Advanced Specialty Certificate in Business

Students completing the eight advanced business courses (24 credits) qualify for the Advanced Certificate in Business.

### Advanced Diploma

While the degree completion track is designed for the business generalist who wishes to obtain a Bachelor's degree in Business Administration from the Open University, BCIT recognizes that many of its diploma graduates already have a degree or for other reasons wish to increase their knowledge in their specialized field. The Advanced Diploma in Business will consist of 12 advanced business courses, four generalist and eight specialist courses (presently under development.)

For specific information on the above degree, certificate or diploma please call Nels Stromgren, program head (604) 432-8921.

## Program Content — Advanced Studies in Business

September			hrs/wk	credits
BUSA	5200	Business, Society and Ethics	3.0	3.0
ECON	5200	Intermediate Macroeconomic Analysis	3.0	3.0
OPMT	5740	Integrated MIS	3.0	3.0
OPMT	5751	Math Models for Business	3.0	3.0

January - April			hrs/wk	credits
BUSA	6800	Strategic Management	3.0	3.0
ECON	6500	Managerial Economics	3.0	3.0
OPMT	5701	Calculus for Management	3.0	3.0
ORGB	5600	Managing Change	3.0	3.0

## Broadcast Communications

### Two-Year Diploma Program (Full-time)

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 broadcasting, such as audio and video production, public relations and cablecasting will find much of the basic background included in these programs. The educational emphasis is upon versatility so a graduate may find employment in a variety of occupations within broadcasting and associated industries. Students 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, music programmer, sports reporter, videotape editor, ENG/EFP camera operator, production assistant, feature editor/reporter, researcher, news reporter, freelance video/film staff, scriptwriter and media relations.

## Radio

Provides detailed and intensive training in radio operations and programming. Extensive instruction is given in announcing, on-air operations, interviewing, commercial copywriting, digital and analog commercial production, news and sports reporting, music programming, feature and program production, as well as other operational areas including sales, promotion, management, computerized musical program scheduling, 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 Greater Vancouver listening area) in second year.

## Television

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, and television audio and multi-track recording. They also cover non-linear (digital) video and audio editing and production, lighting, writing, etc. These skills enable them to work in a variety of positions in television, video production houses, corporate and industrial production, cable television operations and as freelancers.

## Broadcast Journalism

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 applicable subjects. Regular newsroom and field reporting operations develop students' experience in news judgment, reporting and presentation. Full digital news generation and management systems are utilized. Students must have a valid drivers' license and access to a motor vehicle in Levels 2 through 4.

New media technologies and techniques are being introduced in all programs. A digital focus co-exists with analog technology, as both are found extensively in industry.

## General Information

Applicants must pass an entrance exam that evaluates English literacy, current events awareness, general knowledge and computer literacy. Normally, only qualified applicants will be interviewed.

In each of the programs, students are graded against industry and professional standards and must achieve these standards during their terms 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. Students with part-time employment require flexible hours to accommodate the work schedules of the various programs.

BCIT's Broadcast Communications department is affiliated with:

- The British Columbia Association of Broadcasters (BCAB)
- The Canadian Association of Broadcasters (CAB)
- The Radio-Television News Directors Association (RTNDA)
- Canadian Women in Communications (CWC)
- The Broadcast Educators Association (BEAC)

For further information you can contact us at:

Tel. (604) 432-8863 Fax: (604) 432-1792

e-mail: bcitbcst@bcit.bc.ca.

## Program Length

Two years, full-time running from September to May each year.

## Tuition Fees 1999/2000

\$4676.60 for the two-year program.

## Books and Supplies 1999/2000

Student spending above and beyond tuition depends largely on individual preferences and practices. The following estimates provide a range of spending:

### Radio

First year: \$1000-\$2000

Second year: \$1000-\$1500

### Television

First year: \$1000-\$3000

Second year: \$1000-\$2500

### Broadcast Journalism

First year: \$1000-\$1700

Second year: \$750-\$1500

## Entrance Requirements

High school graduation. English 12. All applicants for any Broadcast Communications program must provide proof of basic computer literacy or demonstrate possession of competence by successfully completing a challenge exam prior to being selected. Applicants must provide test results to prove a minimum keyboarding speed of 25 wpm. Applicants should apply early in the calendar year 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 personal history, their career goals and reasons for choosing broadcasting as a career. The application must also contain all pertinent documents, letters of reference, recommendations, school and university/college transcripts and details of related experience.

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## Broadcast Communications Entrance Requirements cont.

Applicants are encouraged to attend Information Seminars which 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 an on-campus interview is not possible, please contact the program head 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, and so on.

The prospective applicant is expected to have a thorough knowledge of and fluency in 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.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

### Re-admission Requirements

Where a student fails a term in the Broadcast Communications program, and where that failure requires the student to leave the program, the following conditions will apply for re-admission:

1. The student must apply for re-admission with application to the Admissions department. An additional application fee must be paid.
2. Courses previously taken at BCIT do not automatically qualify for course credit. BCIT reserves the right to require the applicant to re-take any course within the program. This may include courses that have already been successfully completed, and/or courses where transfer credit may have been previously granted.
3. Re-admission is conditional upon space availability. Where more applicants apply than there are seats available, BCIT reserves the right to select those applicants deemed to have the best chance for success in their chosen program.

## Program Content — 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 1 for Broadcasters	3.0	3.0

### Level 2 (16 weeks plus 4 week practicum)

		hrs/wk	credits
BCST 2203	Copywriting 2	3.0	3.0
BCST 2209	Practicum 1	35.0	
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 2 for Broadcasters	3.0	3.0

Level 3	(15 weeks)	hrs/wk	credits
BCST 3303	Copywriting 3	3.0	3.0
BCST 3310	Radio Programming and Operations 3	16.0	16.0
BCST 3312	Radio 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 2500	Interpersonal Skills	2.0	2.0

### Level 4 (16 weeks plus 4 week practicum)

		hrs/wk	credits
BCST 4403	Copywriting 4	3.0	3.0
BCST 4409	Practicum 2	35.0	11.5
BCST 4410	Radio Programming and Operations 4	25.0	25.0
BCST 4415	Feature Program Production 2	2.0	2.0

*Use a pencil instead  
of a pen.*



*They ask for our grads by name*



## Program Content — Television

Level 1	(15 weeks)	hrs/wk	credits
BCST	1100 Industry Operations	2.0	2.0
BCST	1101 Technical Introduction	3.0	3.0
BCST	1120 Video Basics	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 I for Broadcasters	3.0	3.0
ORGB	2510 Interpersonal Relationships	3.0	3.0

### Level 2 (16 weeks coursework plus 4 week practicum)

hrs/wk	credits
BCST 2209 Practicum I	35.0
BCST 2220 Video Production	17.0
BCST 2222 Theory of Color Television Systems	3.0
BCST 2224 Dramatic Writing for Television	3.0
BUSA 1201 Television Management	3.0
BLAW 3300 Broadcast Law	3.0
COMM 2212 Communication 2 for Broadcasters	3.0

Level 3	(15 weeks)	hrs/wk	credits
BCST	3320 Video Production	18.0	18.0
BCST	3322 Television News	4.0	4.0
BCST	3325 News Shooting and Editing	4.0	4.0
COMM	3312 Corporate Writing in Television	3.0	3.0

### Level 4 (16 weeks coursework plus 4 week practicum)

hrs/wk	credits
BCST 4409 Practicum 2	35
BCST 4420 Video Production	18.0
BCST 4425 News Shooting and Editing	4.0
COMM 4412 Project Writing in Television	3.0

## Program Content — Broadcast Journalism

Level 1	(15 weeks)	hrs/wk	credits
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	1137 Visual Fundamentals for Journalists	2.0	2.0
COMM	1112 Communication I for Broadcasters	3.0	3.0
ECON	1150 Economic Issues	3.0	3.0

### Level 2 (16 weeks coursework plus 4 week practicum)

hrs/wk	credits
BCST 1331 Media Law	2.0
BCST 2209 Practicum I	35
BCST 2230 News Reporting	2.0
BCST 2231 Announcing for Journalists	4.0
BCST 2232 Radio News 2	6.0
BCST 2233 Television News 2	4.0
COMM 2212 Communication 2 for Broadcasters	3.0
COMP 1107 Computers in Broadcasting	3.0

Level 3	(15 weeks)	hrs/wk	credits
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
BCST 3336 Advanced News Writing	2.0
BCST 4409 Practicum 2	35.0
BCST 4430 Reporting Toolbox	2.0
BCST 4432 Radio News 4	10.0
BCST 4433 Television News 4	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 week-ends to emulate industry situations.

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## Broadcast Communications cont.

### Advisory Committee Members Radio

Kathy Baan, Promotion Director, CFAX, Victoria,  
 Dale Buote, Program Director, CKKS-FM Radio  
 Robbie Dunn, President and General Manager, CHNL/CKRV,  
 Kamloops  
 Gary Milne, (Chairperson), General Sales Manager, CKWX,  
 Vancouver  
 Al Murdoch, CKLG-Radio, Vancouver  
 Chris Pandoff, General Manager, CKLG, CFOX, Vancouver  
 Don Pennington, CBC Radio, Vancouver  
 Tom Plasteras, Program Director, CKNW, Vancouver  
 Nancy Wall-MacKenzie, Marketing Representative,  
 Starcom Broadcast Sales, Vancouver

### Advisory Committee Members Television

Rick Beal, Assistant Manager, TV Technical Services,  
 CBC Television, Vancouver  
 Terry Brady, VTV Vancouver Television  
 Dave Calder, Okanagan Skeena Group Ltd.  
 Wayne Carlow, Audiovisual Program Producer, B.C. Hydro  
 Janna M. Dieleman, Delta Cable, Delta  
 Peter Gillespie, CHEK-TV Victoria  
 Ron Harrington, Director, TV Production and Operations,  
 Knowledge Network  
 Heather Hawthorne Doyle, VTV Vancouver Television,  
 Vancouver  
 Martin Hendriks, Operations Manager, Shooters  
 Effie Klein, Global Television  
 Susan Long, Freelance Producer  
 Deepak Sahasraudhe, Soma Television Ltd.  
 Dave Sherwood, Creative Director, CKPG-TV Prince George  
 Don Thompson, General Manager, Finale Productions  
 Martin Truax, (Chair), Freelance Producer  
 Rob Weller, Production Manager, CHBC-TV Kelowna

### Advisory Committee Members Broadcast Journalism

Denelle Balfour, Report, VTV, Vancouver  
 Mike Bothwell, Reporter, U-TV, Vancouver  
 Keith Bradbury, News Director, BCTV Vancouver  
 George Froehlich, U-TV, Vancouver  
 Lorna Haerber, CBC Radio News, Vancouver  
 Sean Leslie, News Director, CJCI, Prince George  
 Carolyn Lewis, Broadcast News, Vancouver  
 Ian Koenigsfest, (Chair), Executive Producer - Current Affairs,  
 CKNW, Vancouver  
 Tom Mark, News Director, CKWX, Vancouver  
 Moira McLean, News Director, Okanagan-Skeena Radio,  
 Kelowna  
 Robert Palmer, Assistant News Director, CHEK-TV, Victoria  
 Mark Schneider, CTV News, Bureau Chief, Vancouver  
 Wayne Williams, Assignment Editor, CBC-TV, Vancouver  
 Steve Wyatt, Senior Producer, BCTV, Burnaby

## Business Administration

### One-Year, Post-diploma Program (Full-time)

This nine-month, post-diploma program is designed for students with college or university graduation (any major) 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.

### Tuition Fees 1999/2000 (subject to change)

\$2338.30 for the nine-month program.

### Books and Supplies 1999/2000

\$918 (general estimated cost and subject to change).

### Entrance Requirements

English 12. College or University graduation (any major) 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 toward designation as a Chartered Accountant, a Certified General Accountant, or a Certified Management Accountant.

*"BCIT's Broadcast School is a wonderful resource for anyone hiring entry level journalists into this market. The program is excellent and constantly updated to meet rigorous industry standards. I have no hesitation in recommending/endorsing the Broadcast Program."*

— Ian Koenigsfest,  
 Public Affairs Director, CKNW

## Program Content — Business Administration

Level 1	(15 weeks)	hrs/wk	credits
BLAW 3100	Business Law	4.0	4.0
BUSA 3700	Microcomputer Software Systems	3.0	3.0
COMM 3310	Advanced Communications for Business Administration	4.0	4.0
COMP 2181	Computer and Information Systems	4.0	5.5
ECON 2000	Managerial Economics	3.0	3.0
FMGT 1110	Financial Management I	4.0	4.0
OPMT 1510	Business Mathematics	4.0	4.0
ORGB 2100	Organizational Behavior	2.0	3.0

Level 2	(20 weeks)	hrs/wk	credits
BUSA 3515	Management Science	3.0	3.0
BUSA 4610	Microcomputer Software Applications	3.0	4.0
BUSA 4810	Management Policy	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

## Faculty and Staff

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R. Kessler, B.Comm., M.A.  
F. Mandl, B.Sc., M.B.A.  
D. Pepper, B.A., M.Sc., Ph.D.  
W. Ratzburg, B.Sc., Dip.Ed., M.B.A.  
S. Scott-Hallam, B.Sc., M.B.A.  
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B. Van der Woerd, B.A., Program Head, Human Resources  
Management  
K. Wainwright, B.A., M.A., Program Head (Acting) 2<sup>nd</sup> year  
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R.A. Yates, LL.B., M.B.A.

## Financial Management

### Two-Year Diploma Program (Full-time)

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.

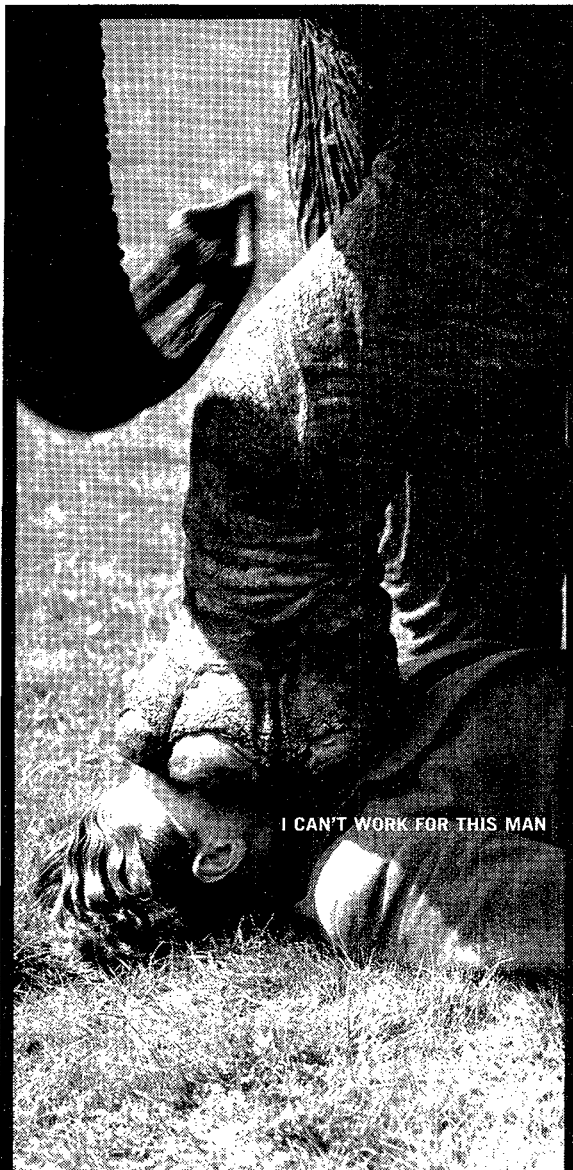
The Taxation program will be of interest to those who would like to work for government or in a professional accounting firm where added tax knowledge would be beneficial. Again, graduates will usually go on to obtain a professional accounting designation.

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 high 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 students with the basic skills and knowledge necessary to provide individual or personal financial advice in such areas as: taxation, investments, estate and retirement planning.

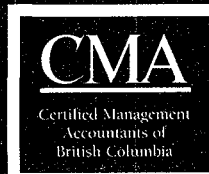
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Sometimes a job just doesn't work out the way you planned. That's when you want to have lots of career options available. Training as a Certified Management Accountant gives you that flexibility. The management training you receive can be implemented in any field you choose. This makes the CMA Program unique. And should help take a load off your mind.

**KEEP YOUR OPTIONS OPEN.**

CALL (604) 687-5891 OR  
1-800-663-9646. [www.cmabc.com](http://www.cmabc.com)



## Financial Management cont.

### 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. Achieving 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 \$3000 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:

1. Professional Accounting - Auditing, Security Fundamentals and Projects in Industry;
2. Advanced Accounting - Advanced Accounting and Auditing;
3. Taxation - Selected Topics in Tax, Auditing and Security Fundamentals;
4. Microfinancial Systems - Advanced Microcomputer Applications, Auditing and Security Fundamentals;
5. Corporate Finance - Enterprise Finance, Investment Banking, Security Analysis and Money and Banking;
6. Financial Planning - Security Analysis, Money and Banking and Financial Planning

Students who are eligible to enter second year Financial Management are guaranteed a seat in either Professional Accounting or Corporate Finance. Admission to other programs may be limited with selection based on academic performance.

### Tuition Fees 1999/2000 (subject to change)

\$4676.60 for the two-year program

### Books and Supplies 1999/2000

First year: \$1268; Second year: \$980 (general estimated cost and subject to change).

### 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), with 70 per cent or better, is a prerequisite for nearly all second-year courses. All applicants are encouraged to contact the department directly to clarify their opportunities as early as possible, (604) 432-8898.

*They ask for our grads by name*

## Entrance Requirements

High school graduation. English 12(C+). Math 11(C+). Applicants must have inquiring and logical minds, the capacity for hard work, excellent communication skills and the ability to work well with others.

Note: Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

## Advanced Training/Degree Transfer and Completion

The Financial Management department offers an Accounting degree completion program to those who already have a Financial Management diploma or equivalent.

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).

Block transfer credit arrangements are in effect with Simon Fraser University, the University of Northern British Columbia, Royal Roads University and Lakehead University (Ontario).

## 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 Certified Management Accountants Society and the Canadian Credit Institute give credit for various subjects, and our graduates are able to achieve a professional designation within two years of receiving their BCIT Diploma.

Students who choose the Finance 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.

The Financial Planning Option is accredited by the Financial Planning Standards Council of Canada as meeting the academic prerequisites necessary to be permitted to write the Certified Financial Planners (CFP) national examinations.

## Program Content — Financial Management

Level 1	(15 weeks)	hrs/wk	credits
BUSA 1100	Management	3.0	3.0
COMM 1100	Business Communications	3.0	3.0
COMP 1104	Introduction to Computing	3.0	3.0
ECON 2100	Microeconomics	3.0	3.0
FMGT 1105	Accounting 1 for Financial Management	4.0	4.0
MKTG 1102	Essentials of Marketing	3.0	3.0
OPMT 1110	Business Mathematics	4.0	4.0

Level 2	(20 weeks)	hrs/wk	credits
COMM 2200	Business Communications 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 for Financial Management	4.0	5.5
FMGT 2540	Working Capital Management*	3.0	2.0
FMGT 2710	Computerized Accounting*	3.0	2.0
FMGT 2910	Finance Reports*	3.0	2.0
OPMT 1130	Business Statistics	4.0	5.5
ORGB 2100	Organizational Behavior*	3.0	2.0

\*denotes a half-term (10 week) course.

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

## Program Content — 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 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 4910	Projects in Industry*	4.0	2.5
OPMT 4300	Quantitative Analysis for Finance*	4.0	2.5

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## Financial Management cont.

### Program Content — Advanced Accounting

Level 3	(15 weeks)	hrs/wk	credits
BLAW 3100	Business Law	4.0	4.0
FMGT 3110	Financial Accounting I	5.0	5.0
FMGT 3210	Cost and Managerial Accounting I	4.0	4.0
FMGT 3310	Auditing I	3.0	3.0
FMGT 3410	Taxation I	4.0	4.0
FMGT 3510	Finance I	4.0	4.0
FMGT 3720	Advanced Microcomputer Applications I	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 4710	Microcomputer Systems 2	4.0	5.5

### Program Content — Taxation

Level 3	(15 weeks)	hrs/wk	credits
BLAW 3100	Business Law	4.0	4.0
FMGT 3110	Financial Accounting I	5.0	5.0
FMGT 3210	Cost and Managerial Accounting I	4.0	4.0
FMGT 3310	Auditing I	3.0	3.0
FMGT 3410	Taxation I	4.0	4.0
FMGT 3510	Finance I	4.0	4.0
FMGT 3720	Advanced Microcomputer Applications I	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 4430	Selected Topics in Tax*	4.0	2.5
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

### Program Content — Microfinancial Systems

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

\*denotes a half-term course

### Program Content — Corporate Finance

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

\*denotes a half-term course

### Program Content — Financial Planning

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

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## Human Resource Management

### Two-Year Diploma Program (Full-time)

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

Students are exposed to current developments in a constantly changing human resource management field. They learn about the legal and labour relations management issues impacting B.C., Canadian, and international business operations.

The program develops skills and abilities focusing on effective time and stress management, teamwork, making effective presentations, building a variety of interpersonal skills experiences, problem analyses and decision-making.

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

### The Program

Applicants apply for the Human Resource Management program. The courses in first year (level 1 and 2) are primarily those of the Management Systems first year program. For students to progress to second year (level 3 and 4) they must achieve an overall average of 75 per cent in their first year courses, with no failures in any courses.

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.

### Tuition Fees 1999/2000 (subject to change)

\$4676.60 for the two-year program.

### Books and Supplies 1999/2000

First year: \$918; Second year: \$1650 (general estimated cost and subject to change).

*continued next page*

## Human Resource Management cont.

### Entrance Requirements

High school graduation. English 12(C+). Math 11(C+). Enrolment is limited. Applicants should apply early, stating full details of work experience, outlining extracurricular activities, reasons for selecting this program, and reasons for pursuing a career as a Human Resources Professional. 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.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12. For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

### Progression into Second Year

In order to be eligible to progress into the second year of the Human Resource Management program students must achieve the following in their first year of studies:

1. Achieve an overall average of 75 per cent or better in all 1st year courses. No failures are permitted.
2. Where Transfer Credit is requested or has previously been granted, the Department will verify the grade the students obtained in the course and use that grade when determining the overall 1st year GPA.
3. Space is limited. Where more eligible students apply than there is space available, BCIT reserves the right to select those students considered to have the best chance for success in the program.

### Direct Entry for College, Institute or University Graduates

Individuals who have previously graduated from a university, college, or institute should refer to BCIT Human Resource Management Post-Diploma program.

Direct-entry into the second year of the Human Resource Management program is possible for those who have previously attended a university, college, or institute business program. To be considered eligible as a "Direct-Entry" applicant, individuals must demonstrate (through transcripts and course outlines) that they have previously completed equivalency to all first year courses. As part of the selection process for direct entry, an interview may be required to review the applicant's academic record, work experience, communication skills, teamwork skills, and organizational skills. 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 strongly recommended for graduates of this diploma.

### Program Content — Human Resource Management

Level 1	(15 weeks)	hrs/wk	credits
BUSA 1100	Management	3.0	3.0
BUSA 1600	Decision Support I	3.0	3.0
COMP 1104	Introduction to Computing	3.0	3.0
ECON 2100	Microeconomics	3.0	3.0
FMGT 1100	Accounting I	3.0	3.0
MKTG 1102	Essentials of Marketing	3.0	3.0
OPMT 1110	Business Mathematics	3.0	3.0

Level 2	hrs/wk	credits
BUSA 2250 Business Fundamentals	3.0	4.0
BUSA 2600 Decision Support 2	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
OPMT 1130 Business Statistics	4.0	5.5
ORGB 2200 Organizational Behavior*	3.0	2.0
ORGB 2300 Organizational Behavior 2*	3.0	2.0

Level 3	hrs/wk	credits
BLAW 3800 Human Resource Manag Law	3.0	3.0
BUSA 3500 Management Science	3.0	3.0
HRMG 3130 Competency Design and Analysis	3.0	3.0
FMGT 3560 Finance I	4.0	4.0
HRMG 3150 Human Resource Management Systems I	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 Administrations	3.0	3.0

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 4401 Compensation Management*	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



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## Human Resource Management

### One-Year Post-diploma Program (Full-time)

Provides specialized knowledge, skills and abilities about organizational systems and processes that focus upon enhancing human behavior in the workplace. The career track of graduates is aimed at entrance, at a professional/technical level, into either a generalist or specialist human resource management position. Some graduates also find employment in operational units with a heavy emphasis on team management and project development activities. More experienced graduates also have an opportunity to pursue human resource consulting activities. Students are exposed to current developments in a constantly changing human resource management field. They learn about the legal and labour relations management issues impacting B.C., Canadian, and International business operations.

The program develops skills and abilities focusing on effective time and stress management, teamwork, making effective presentations, building a variety of interpersonal skills, problem analyses and decision-making.

The program also gives participants exposure to the major computer and non computer-based systems and processes 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 a human resource management career should consider this program. Institute graduates may also consider this program as part of a degree completion track.

### The Program

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

### Program Length

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

### Tuition Fees 1999/2000 (subject to change)

\$2338.30 for the nine-month program.

### Books and Supplies 1999/2000

\$918 (general estimated cost and subject to change).

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## Human Resource Management cont.

### Entrance Requirements

English 12. College or University Degree or Diploma of Technology. BCIT Part-time Studies course "FMGT 1152 - Accounting for the Manager" with 65 per cent or better. Proficiency in microcomputer application including spreadsheets and word processing equivalent.

Enrolment is limited. Applicants should apply early, stating full details of work experience, outlining extracurricular activities, reasons for selecting the program, and reasons for pursuing a career as a Human Resources Professional. Appropriate business experience will greatly strengthen the application. Applicants should be good communicators and people-oriented with a willingness to work effectively with fellow workers and the public.

### Program Content — Human Resource Management

Level 1	(15 weeks)		hrs/wk	credits
BLAW 3800	Human Resource Manag Law		3.0	3.0
FMGT 3560	Finance I		4.0	4.0
HRMG 3130	Competency Design and Analysis		3.0	3.0
HRMG 3150	Human Resource Management Systems I		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)		hrs/wk	credits
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

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## International Trade and Transportation

### Two-Year Diploma Program (Full-time)

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 and Transportation program receive a broad training in the fundamentals of business and their application to trade and transport. International business depends upon successful market analysis and effective entry strategies, knowledge of transportation alternatives and logistics planning.

### Job Opportunities

With the versatility of the International Trade and Transportation program, graduates find employment in a wide range of industries and careers. The International Trade and Transportation program graduate may be employed in any economic sector in which international markets play a role in the firm's success. Career opportunities occur in marketing, finance and management with firms such as trading houses, importers and exporters, customs brokers, freight forwarders and transportation providers.

### Program Length

Two years, full-time in September each year.

### Direct-Entry to Second Year

Applicants who already possess a university degree may be eligible for direct-entry to the second year of the program. Applicants are required to have English 12 with a C+ or better, strong oral communication skills and working knowledge of Windows, Word, and Excel. Additional prerequisites for direct entry include FMGT 1152 with 70 per cent or better, COMM 1100, COMM 2200 and TDMT 1200. All applicants are encouraged to contact the department at (604) 451-6714. In all cases, applicants are encouraged to apply as early as possible.

### Entrance Requirements

High school graduation. English 12(C+). Math 11(C+). Additionally, a successful departmental interview is required to assess oral communication skills. This interview is waived for those applicants who score 60 per cent or higher on the B.C. English 12 Provincial Examination.

Applicants should apply early, stating full details of work experience and outlining extracurricular activities. Appropriate business experience will strengthen application. Applicants should be good communicators and people-oriented, with a willingness to work effectively with fellow workers and the public.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

### Accreditation

A number of industry certifications are available prior to and upon completion of the program. These include CITT (Chartered Institute of Traffic and Transport), CIT (Charter Institute of Transport), Revenue Canada - Canada Customs, Level 1. In addition, other industry associations give credit for various subjects which allow for the achievement of additional professional designations shortly after receiving their International Trade and Transportation diploma.

### 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. Currently, block credit transfer is available from Lakehead University, Open Learning or Royal Roads University.

### Program Content — International Trade and Transportation

Level 1	( 15 weeks)	hrs/wk	credits
BUSA 1100	Management	3.0	3.0
COMM 1100	Business Communications	3.0	3.0
COMP 1104	Introduction to Computing	3.0	3.0
ECON 2100	Microeconomics	3.0	3.0
FMGT 1100	Accounting I	4.0	4.0
MKTG 1102	Essentials of Marketing	3.0	3.0
OPMT 0300	Learning Skills	0.0	0.0
OPMT 1110	Business Mathematics	4.0	4.0
TDMT 1100	Learning Skills	1.0	1.0
TDMT 1101	Geography of Trade	3.0	3.0
TDMT 1150	Distribution I (CITT)	3.0	3.0

Level 2	( 20 weeks)	hrs/wk	credits
BLAW 3410	Business and International Law	4.0	4.0
COMM 2200	Business Communications	3.0	3.0
ECON 2200	Macroeconomics	3.0	3.0
FMGT 2100	Accounting 2	4.0	4.0
OPMT 1121	Business Statistics	4.0	4.0
OPMT 2209	Computer Applications	2.0	2.0
OPMT 1148	Industrial Engineering	4.0	4.0
TDMT 2100	Team and Learning Skills 2	1.0	1.5
TDMT 2203	Transportation Economics	3.0	3.0
TDMT 2250	Distribution II (CITT)	3.0	3.0

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## International Trade and Transportation cont.

Level 3 (15 weeks)		hrs/wk	credits
FMGT	3550 Business Finance for International Trade and Transportation Logistics	3.0	3.0
MKTG	2309 Market Research I	4.0	4.0
OPMT	3301 Quantitative Methods for Business	4.0	4.0
OPMT	3353 Computer Applications	3.0	3.0
TDMT	2310 Introduction to Political Science	2.0	2.0
TDMT	3301 Logistics I	3.0	3.0
TDMT	3305 International Trade	3.0	3.0
TDMT	3315 Intermodal Transportation	3.0	3.0
TDMT	3402 Introduction to Projects	3.0	3.0

Level 4 (20 weeks)		hrs/wk	credits
FMGT	4550 Management Accounting	3.0	3.0
HRMG	3050 Management Workshop*	5.0	3.5
OPMT	1404 Warehouse and Purchasing Management	5.0	4.0
OPMT	1445 Quality Assurance Services	3.0	4.0
OPMT	4469 Business Online	2.0	2.5
TDMT	1409 Canada Customs and NAFTA	3.0	4.0
TDMT	4401 Logistics 2*	3.0	2.0
TDMT	4411 Industry Projects*	18.0	18.0

\* denotes a half-term course

### Faculty and Staff

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 G. Boleen, B.Comm., CITT  
 K. Boswell, M.Mus., C.G.A.  
 C. Chan, M.B.A.  
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 Bill Clearie, Westward Shipping, Chair  
 Frauken Danmeyer, LEP International Ltd.  
 Cliff Edwards, Stilewood International Manufacturing Ltd.  
 Yvonne Gill Winder, Tree Island Industries Ltd.  
 Ross Hodges, Casco Terminals Ltd.  
 Ross Johnston, Mustang Survival  
 Kevin Ouelette  
 Catherine Ward, Daishowa Canada  
 Geoffrey Barlow, Repap International Lumber  
 Sandy Ferguson, Alliance of Manufacturers and Exporters  
 Bill Lee

## Management

### Bachelor of Technology (Part-time)

BCIT is proud to offer Canada's first competency based management degree at the baccalaureate level. The Bachelor of Technology in Management is a self-paced and self-directed program. The program applies degree level skills and knowledge directly to the workplace. The learner builds management capabilities by focusing strategically on areas needing development, while refining areas of strength. This method is efficient, effective and most importantly — results oriented.

**Please Note:** This program is delivered in a "distance education" format, using e-mail, telephone and on-line chats to communicate with degree coach and student groups. Students do not attend BCIT campus for lecture style classes.

#### Prospective Students:

The program is designed for individuals who are currently working and would like to build their generic management knowledge and skills. The learner will focus directly on knowledge, skills and behaviors vital to managerial success. All of the readings, assignments and major projects are designed to improve the student's on-the-job performance. Information gathering, analytical, problem solving, strategic thinking and decision-making are applied and developed in the learner's current work situation. The application of skills and knowledge will be greatly enhanced by the in-depth knowledge of their organization and industry.

The program combines the academic (reading, report writing, student discussions etc.) with practical behavioral skills (taking responsibility for mistakes, running effective meetings etc.) This combination of learning — then applying the skill is deemed most effective for the mature, adult learner. The term "competency" (used throughout the degree description) refers to the level of skill (or competence) displayed by the individual.

## Program Structure

The program's learning goals are accomplished by creating a close partnership between the learner, the BCIT coach and the student's chosen workplace advisor.

Prior to application, each student will be asked to identify a workplace advisor. This individual should be in a position to "empower" the student to complete the program (possibly by allowing the student to take on additional duties to complete the required assignments). The workplace advisor should be willing to support and encourage the student throughout the degree process.

Each student begins the program in the Self-Assessment and Self-Management module (MGMT 8010). The student will assess themselves and be assessed by employers, peers, and direct reports. The result of this assessment is a clear snapshot of the individual's current level of competency in each key area. A unique roadmap for future development emerges for each student. Some students may move more quickly through modules where clear ability is already demonstrated, **but proof of competency is required for all modules.**

This takes the form of a final assessment for each module of work and will incorporate the learned behavior as well as demonstrate the learned skills and knowledge by completion of a major project.

### Using Technology and the Internet:

The program uses a proven electronic mentoring and management development software system, which will keep the student on-track, focused and paced towards gaining the degree. This software will also provide the student with important information of "how to" make the behavior changes required. Web-based research is required in many modules of work. Suggested internet sites to visit are provided. Many resources are available through the program's Web site.

## System Requirements:

The system requirements are:

- 486 PC with 8 megabytes of RAM
- Microsoft Windows 3.1 (or better)
- internet connection (with e-mail program used to file transfer assignments)

*Use a pencil  
instead of a pen*



## Entrance Requirements:

The Entrance requirements for the Bachelor of Technology in Management are listed below. Please submit the entire package of information with application fee to the Registrar's Office:

- BCIT Diploma or equivalent
- current employment in a management or supervisory position (title is not as important as duties performed on the job)
- two years of relevant, full-time work experience (preference will be given to those in supervisory/managerial roles)
- English 12 or equivalent,
- computer literacy: working knowledge of MS Word, MS Excel, e-mail and internet
- Math 12 or equivalent
- strong communication skills: assessed through written letters and interview
- completion of diploma level accounting: FMGT 1100 or FMGT 1152 or equivalent
- A letter explaining the relationship between the degree program and the candidate's personal goals (please describe current position)
- A letter of support from the employer stating a willingness of the organization to facilitate the employee taking the degree and also identifying workplace advisor for the student
- Two letters of support from colleagues, supervisors, educators, clients or customers commenting on the applicant's ability to complete the degree.
- Resume stressing skills developed, training and projects undertaken.
- An interview with the Program Head. The interview will not be granted till all other entrance requirements have been met.

## Registration Procedures

Individuals interested in applying for entry into the Bachelor of Technology in Management should first contact Program Advising at (604) 434-1610 for general information.

Individuals will register for courses by following BCIT's standard procedures for registering in a distance education course. This can be accomplished in five ways: mail, fax, phone, in-person, web. For more information please see the registration procedures listed under "Services" in your calendar.

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## Program Length

The Bachelor of Technology in Management must be completed within six years from acceptance into the program. The program is self-paced therefore completion time is determined by the learner. The program is designed to be completed in two years.

**Please note:** employment is required to complete the program. Any breaks in employment will result in a break in the program delivery, as proof of competency occurs on-the-job.

## Course Transfer Credit

The program is competency based and therefore no transfer credits are accepted for the Technical Specialty Component. The Liberal Education Component must be transferred in from another Institution.

## Grading

Upon completion of each module, students will be assigned a grade of 80 per cent. BCIT degree coaches will work with each learner to develop their competence in each area until it reflects a superior level of performance. All final project packages are evaluated by an area expert (an academic specialist in the competency area) to ensure that it meets this academic standard.

## Program Content:

The Bachelor of Technology in Management is comprised of two key components:

1) Advanced Technical Specialty	48.0 credits
2) Liberal Education	12.0
Total	60.0

### I. Advanced Technical Component - Management Competency (48 credits)

- a) Required - all students begin the program by taking:  
MGMT 8010 Self Awareness and Self Management 3.0

- b) Students must complete all of the following 45 credits. The order in which courses undertaken will be determined by student and their assigned degree coach:

MGMT 8110	Communicate Effectively	3.0
MGMT 8120	Build Effective Working Relationships	4.0
MGMT 8210	Develop Leadership Roles	1.0
MGMT 8220	Foster Teamwork	2.0
MGMT 8230	Lead Effectively	2.0
MGMT 8310	Prepare for Change	1.0
MGMT 8320	Plan Quality Change	2.0
MGMT 8330	Manage Change	2.0
MGMT 8410	Manage a Work Unit's Human Resources	4.0
MGMT 8420	Manage Financial Resources	6.0
MGMT 8430	Manage Operational Performance	7.0
MGMT 8510	Know the Global Issues Affecting your Industry	1.0
MGMT 8520	Determine Implications of Law and Organizational Regulations	3.0
MGMT 8530	Organizational and Personal Ethics	2.0
MGMT 8610	Think Strategically	1.0
MGMT 8620	Formulate Strategies	2.0
MGMT 8630	Implement Strategies	2.0

### 2. Liberal Education (12 credits)

Students must complete 12.0 credits of Liberal Education. For further information please contact the Bachelor of Technology department in the Registrar's Office at (604) 432-8230.

For Further Information Please Contact:

Marnie Wright, program assistant  
Business Programs  
3700 Willingdon Avenue  
Burnaby, BC V5G 3H2  
(604) 432-8658  
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### Faculty and Staff

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*"Perhaps the most valuable lesson I learned at BCIT was the importance of focus: the most compelling elements of any story are lost without it. Working in industry, time is precious and a focussed story makes the difference between mediocre radio and 'I can't get out of my car' radio."  
— Shiral Tobin, Producer,  
The Rafe Mair Program,  
CKNW, Year and Program*

## Management Systems

### Two-Year Diploma Program (Full-time)

Develops 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 that develop managers who can implement and use microcomputer-based information and decision systems. Graduates of the program will be effective in both larger business firms and in small business and entrepreneurial activity.

### Job Opportunities

Graduates are ready to apply skills they have learned from accounting, operations management, marketing, mathematics, communications, business law, economics, organizational behavior, human resource management and computer applications directly in supervisory and management positions.

Graduates follow careers in a range of areas such as marketing and sales, banking and insurance. Other opportunities are to continue on to complete a university degree program or a professional accounting program, or to start their own businesses.

### The Program

After the first year of core business courses, students will continue in the Management Systems program or may apply for the Human Resource Systems program. The optional courses within the second year of Management Systems are shown under the headings: *Option A-Management Systems* and *Option B-Microcomputers in Business*

Students will generally follow the course of studies shown as Levels 1 through 4, with some changes in the offerings and order of courses as the program is revised and updated to reflect changes in business and industry.

Students in courses such as BUSA 1600 and BUSA 3600 will find it beneficial to have access to a microcomputer outside the Institute. Those who have outside access to microcomputers should so advise their instructors.

### Program Length

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

### Tuition Fees 1999/2000 (subject to change)

\$4676.60 for the two-year program.

### Books and Supplies 1999/2000

First year: \$918; Second year: \$1270 (general estimated cost and subject to change).

## Entrance Requirements

High school graduation. English 12(C+). Math 11(C+). Applicants should apply early, stating full details of work experience and outlining extracurricular activities. Appropriate business experience will strengthen application. Applicants should be good communicators and people-oriented, with a willingness to work effectively with fellow workers and the public.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

### Direct-Entry

Entry into Level 2 (January) is possible when space is available, provided students have: English 12 (C+). All of the level one courses or acceptable equivalents.

Entry into Level 3 (September/ Second Year) is possible when space is available, provided students have: English 12 (C+). All of the level one and two courses or acceptable equivalents.

### 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 toward 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 Content — Management Systems

Level 1	(15 weeks)	hrs/wk	credits
BUSA 1100	Management	3.0	3.0
BUSA 1600	Decision Support I	3.0	3.0
COMM 1100	Business Communication I	3.0	3.0
ECON 2100	Microeconomics	3.0	3.0
FMGT 1100	Accounting I	4.0	4.0
MKTG 1102	Essentials of Marketing	4.0	3.0
OPMT 1110	Business Mathematics	4.0	4.0

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## Management Systems cont.

Level 2	(20 weeks)	hrs/wk	credits
BUSA 2250	Applied Business 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 Behavior 1*	3.0	2.0
ORGB 2300	Organizational Behavior 2*	3.0	2.0

### 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.

### Management Systems Option

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

### Microcomputers in Business Option

Level 3	(15 weeks)	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 I	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

Level 4	(20 weeks)	hrs/wk	credits
BUSA 4600	Microcomputer Applications 3	4.0	5.5
BUSA 4800	Management Policy	3.0	4.0
BUSA 4900	Directed Studies	6.0	8.0
COMP 3110	Networks and 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
OPMT 1171	Materials Management*	4.0	2.5
TDMT 1353	International Business*	4.0	2.5

### Faculty and Staff

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### Advisory Committee

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Greg Basham, I.C.B.C.  
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Rick Boychuk, C.I.B.C.  
Howard Cherniak  
Roger Cullum, Royal Bank  
Lori Daniels, B.C. Hydro  
Tom Getzie, Forest Industrial Relations Ltd.  
Janice Hill, ABR Consultants  
Peter Howes  
Joe Lee, Business Performance Consultants  
Lorne McLauchlan, B.C. Transit  
Bob Miller, Pacemaker Homes  
Chris Offer, City of Vancouver  
Bob Tarnowski, Cymbolic Sciences  
Ken Tongue, First Class Systems



## Marketing Management

### Two-Year Diploma Program (Full-time)

Equips 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 Commercial Real Estate industry; the international trading sector; the business communications industry, tourism firms and services.

Marketing is the task of making available the service a firm or organization can offer to satisfy the needs of its customers or patrons. 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.

### Job Opportunities

**Marketing Communications - General Option** 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 **Marketing Communications - Direct Response** option is presently under development.

The **Commercial Real Estate** program prepares the graduate for sales, agent, mortgage brokerage, appraisal, property management and 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 private sector jobs in firms or organizations engaged in developing new tourism products and services or expanding the existing demand for these services, and in destination management organizations where product/market planning and research is essential.

The **Professional Sales** option prepares individuals for positions in distribution companies that sell their products and services to other businesses, such as industrial buyers, 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 Communications 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 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.

## Tuition Fees 1999/2000 (subject to change)

\$4676.60 for the two-year program.

## Books and Supplies 1999/2000

First year: \$1000; Second year: \$1425 (general estimated cost and subject to change).

## 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. Applicants are encouraged to apply early. Resume recommended.

There are two methods of entry:

1. Applicants who have achieved a Degree, Associate Degree or Diploma of Technology are eligible for entry if they have also achieved equivalency to these first year courses: COMM 1100, COMM 2200, FMGT 1100, FMGT 2100, MKTG 1102, MKTG 2202, MKTG 2243, OPMT 1110, OPMT 1130, TOUR 1260 (Tourism option only), and ECON 2100, ECON 2200 (Commercial Real Estate option only). Plus English 12 with a C+ or better.
2. Applicants who have not achieved a Degree, Associate Degree or Diploma of Technology are eligible for entry if they have achieved equivalency to all of the first year courses. Plus English 12 with a C+ or better.

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## Marketing Management cont.

3. Space is limited. The department selects, from the pool of eligible applicants, those applicants considered to have the greatest chance of success in the program and industry.

### 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 Commercial 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.

Upon completion of the Professional Sales program and industry experience requirements, graduates are eligible to apply to the Canadian Professional Sales Association (CPSA) Sales Institute to obtain the Canadian Professional Sales Representative (CPSR) designation.

### Entrance Requirements

High school graduation. English 12(C+) or better. Math 11(C+) or better. A personal interview with the program faculty may be required to obtain final acceptance.

Applications must be accompanied by a resume and a letter explaining your reason for taking the program. Candidates must state program preference: Marketing Communications, Commercial Real Estate, Tourism, Professional Sales, or Small Business Development when applying for admission to the first year of the Marketing Management Technology.

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 two 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 in the fall and spring. These are free of charge and open to all to attend. Sessions will be held in the IBM Building (SE6), Room 207, on the Burnaby campus, with signs posted at the entrances to the building if the room number has changed. Scheduled dates and times for Fall 1998 and Spring 1999 are as follows.

To register, or for further information, please contact Registration and Information at (604) 434-1610:

Friday, October 23, 1998	1900-2100
Saturday, November 21, 1998	1000-1200
Saturday, February 20, 1999	1000-1200
Friday, March 19, 1999	1900-2100
Saturday, April 17, 1999	1000-1200
Friday, May 14, 1999	1900-2100

Where: IBM (SE6) Building, Room 207

Registration: Contact (604) 434-1610. Registration is requested but not required.

Applicants to the **Commercial Real Estate** program are urged to attend an information session offered throughout the year. These are free of charge and are held on Tuesdays at 1830. Sessions will be held in the Town Square Building on the Burnaby Campus. Scheduled dates and times for Spring 1999 are as follows. To register, or for further information, please contact Registration and Information at (604) 434-1610:

Tuesday, December 1, 1998	1830-2030
Tuesday, March 2, 1999	1830-2030
Tuesday, April 6, 1999	1830-2030
Tuesday, May 4, 1999	1830-2030

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

*Consider your  
input and output -  
think of Mother  
Nature.*



## Program Content — Marketing Management

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 I	4.0	4.0
MKTG	1102	Essentials of Marketing	3.0	3.0
OPMT	1110	Business Mathematics	4.0	4.0

Level 2 (all students, 20weeks)			hrs/wk	credits
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 Behavior*	3.0	2.0
TOUR	1260	Issues in Tourism (Tourism Program only)	3.0	4.0

\*denotes a half-term course

## Marketing Communications - General Option

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

Level 3 (15 weeks)			hrs/wk	credits
BLAW	3100	Business Law	4.0	4.0
FMGT	3222	Management Accounting for Marketing	4.0	4.0
MKTG	2309	Marketing Research I	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 and Event Marketing	4.0	4.0
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	Marketing Communications Internship*	18.0	12.0
MKTG	4419	Direct Marketing Dynamics*	3.0	2.0

## Marketing Communications - Direct Response (Under development)

### Commercial Real Estate Option

Level 3 (15 weeks)			hrs/wk	credits
MKTG	2309	Marketing Research I	4.0	4.0
MKTG	3311	Real Estate Principles I	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
MKTG	3334	Advanced Sales and Negotiating	4.0	4.0

Level 4 (20 weeks)			hrs/wk	credits
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 Principles 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

\*denotes a half-term course

### Tourism Management Option

Level 3 (15 weeks)			hrs/wk	credits
FMGT	3222	Management -Accounting Marketing	4.0	4.0
MKTG	2309	Marketing Research I	4.0	4.0
MKTG	3306	Principles of Small Business Management	4.0	4.0
TOUR	2301	Group Travel, Charters and Tours	3.0	3.0
TOUR	2900	Regional Tourism Field Study (Practicum)	1.0	1.0
TOUR	3320	Convention, Trade Show Markets	4.0	4.0
TOUR	3324	Tourism Mktg Planning	4.0	4.0
TOUR	3410	Special Events and Promotion	3.0	3.0

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## Marketing Management cont.

Level 4	(20 weeks)	hrs/wk	credits
BLAW 3100	Business Law	3.0	4.0
HRMG 3100	Human Resource Management*	3.0	2.0
MKTG 3409	Marketing Research 2*	3.0	2.0
MKTG 4407	Case Studies - Entrepreneurship*	4.0	2.5
TOUR 3411	Passenger Transportation Marketing*	3.0	2.0
TOUR 3415	Resort/ Hotel Marketing & Sales*	3.0	2.0
TOUR 3445	Cultural Tourism & Geography	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

### Professional Sales Option

Level 3	(15 weeks)	hrs/wk	credits
FMGT 3222	Management -Accounting Marketing	4.0	4.0
MKTG 2309	Marketing Research I	4.0	4.0
MKTG 3301	Computer Applications in Marketing	4.0	4.0
MKTG 3306	Principles of Small Business Management	4.0	4.0
MKTG 3334	Advanced Sales & Negotiating	4.0	4.0
MKTG 3343	Sales Management	4.0	4.0

Level 4	(20 weeks)	hrs/wk	credits
BLAW 3100	Business Law	4.0	4.0
MKTG 3305	International Marketing	4.0	5.5
MKTG 3338	New Product Development*	4.0	2.5
MKTG 3409	Marketing Research 2*	3.0	2.0
MKTG 4401	Marketing Planning	4.0	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

### Small Business Development Option

Level 3	(15 weeks)	hrs/wk	credits
FMGT 3222	Management Accounting - Marketing	4.0	4.0
MKTG 2309	Marketing Research I	4.0	4.0
MKTG 3301	Computer Applications in Marketing	4.0	4.0
MKTG 3306	Principles of Small Business Management	4.0	4.0
MKTG 3334	Advanced Sales & Negotiating	4.0	4.0
MKTG 3343	Sales Management	4.0	4.0

\*denotes a half-term course

Level 4	(20 weeks)	hrs/wk	credits
BLAW 3100	Business Law	3.0	4.0
MKTG 3305	International Marketing	4.0	5.5
MKTG 3338	New Product Development*	4.0	2.5
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

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## **Operations Management**

### **Two-Year Diploma Program (Full-time)**

Operations Managers are responsible for the production and distribution of goods and services in daily use. Their work involves them in the process of continuously improving methods and processes to increase productivity for the benefit of the organization and for society at large.

Students in Operations Management develop strong analytic and team abilities that will enable them to become prime movers in organizational change. Graduates have the technical and managerial skills to assist organizations in minimizing new product development times, reducing inventories, responding quickly to customer needs, increasing productivity, improving the quality of goods and services, and enriching the work environment.

Operations Management emphasizes business process improvement through people and communication skills, creative problem solving, and innovation. These skills are developed by a mix of business and technical courses in industrial engineering, total quality management, materials management, accounting, economics, computer applications, systems analysis, business mathematics, statistics and industrial relations.

In the final 10 weeks of the two-year program, students work in teams to collect data, analyze and recommend solutions to an opportunity for improvement in a real life setting. Organizations of all types producing the entire range of goods and services including government and not for profit firms participate in this. Typical projects are:

- Quality control improvements of process control methods for a wood fibre plant
- Development of an effective inventory control system for a building supply outlet
- Work measurement and layout improvement for a high quality custom office furniture firm
- Improvements in work ordering cycle and vehicle usage for the plant operations of a large university
- Ordering accuracy and inventory improvements for a movie catering company
- Banquet pricing model development for a hotel chain
- Substantial reduction of the annual multi million dollar waste fill disposal bill for a gas utility
- Work layout improvements for a manufacture of automobile deflector shields
- Work measurement and methods improvement for a bakery employing 120 people

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## Operations Management cont.

- Flow process analysis and optimization for a manufacturer of fuel cells
- Reduction of passenger waiting times for an airport operation

### Job Opportunities

Graduates have found careers in a variety of industries including manufacturing, service, distribution and government. Typical entry-level positions include material planner/scheduler, buyer, project coordinator, production supervisor, quality assurance technologist, shipping/receiving supervisor, systems analyst, inventory analyst, maintenance coordinator, management trainee, business analyst, warehouse supervisor, assistant plant manager, purchaser, industrial engineering technologist, product analyst, or systems troubleshooter.

With related experience, Operations Management graduates may achieve positions as 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/or vice president operations.

### Professional Membership

Operations Management students are excellent candidates to pursue professional membership in:

- APICS
- American Society for Quality Control
- Purchasing Management Association of Canada
- Canadian Material Handling and Distribution Society
- Project Management Institute
- International Facilities Management Association
- Data Processing Management Association

### Program Length

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

### Tuition Fees 1999/2000 (subject to change)

\$4676.60 for the two-year program.

### Books and Supplies 1999/2000

First year: \$1690; Second year: \$1250 (general estimated cost and subject to change).

### 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 Bachelor's 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 toward their Bachelor of Administrative Studies degree.

## Entrance Requirements

High school graduation. English 12(C+). Math 11(C+). If your mathematical skills are in doubt, it is recommended that you take Preparatory Business Math OPMT 0199.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

### Direct-Entry to Second-Year

Applicants who already possess a Canadian university Degree, Associate Degree, or a Diploma of Technology may be eligible for direct entry to the second year of the Operations Management program. The specific entrance requirements are: English 12 (C+); Canadian Degree, Associate Degree, or Diploma of Technology; FMGT 1152 with 70 per cent or better or FMGT 2100 with 50 per cent or better; OPMT 1200 (offered over 3 weeks in August); COMM 2099 (offered over one week in August) or COMM 2203; working knowledge of Windows, WORD, and EXCEL; strong oral communication skills.

Those interested in pursuing this option should attend an Operations Management Information Session (call (604) 434-1610 for dates) and identify themselves at the end of the session as an individual interested in the Direct-Entry option. Applicants are encouraged to apply early.

Applicants who have completed the equivalent of the first-year program at BCIT may also be eligible for direct-entry to second year.

All direct-entry applicants are encouraged to contact the department directly to clarify their opportunities as early as possible, (604) 451-6714

### Program Content — Operations Management

Level I	(15 weeks)	hrs/wk	credits
BUSA 1100	Intro to 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 I	4.0	4.0
MECH 1801	Interpretation of Engineering Drawings	3.0	3.0
OPMT 0300	Learning Skills	0.0	0.0
OPMT 1108	Applied Mathematics for Business/Industry	4.0	4.0
OPMT 1140	Tools for Quality Management	6.0	6.0

Level 2	(20 weeks)	hrs/wk	credits
COMM 2200	Business Communication	3.0	4.0
ECON 2200	Macroeconomics	3.0	4.0
FMGT 2100	Accounting 2	4.0	5.5
MECH 1910	Manufacturing Processes	4.0	5.5
OPMT 1208	Applied Statistics for Business/Industry	4.0	5.5
OPMT 1250	Inventory Management	2.0	3.0
OPMT 2209	Spreadsheet Applications	2.0	2.5
OPMT 2240	Quality Management	5.0	6.5
OPMT 2265	Business Process Management	3.0	4.0

Level 3	(15 weeks)	hrs/wk	credits
FMGT 3224	Cost Accounting: Operations Management	4.0	4.0
OPMT 2360	Material/Capacity Requirements Planning	2.0	3.0
OPMT 3308	Quantitative Business Analysis	4.0	4.0
OPMT 3341	Process Improvement Project	6.0	6.0
OPMT 3344	Information Technologies	2.0	2.0
OPMT 3361	Database Applications	4.0	4.0
OPMT 3445	Project Management	3.0	3.0
HRMG 3095	Coaching Skills	4.0	4.0

Level 4	(20 weeks)	hrs/wk	credits
COMP TBA	Enterprise Systems*	3.0	2.0
HRMG 3200	Industrial Relations	3.0	3.0
MKTG 1115	Entrepreneurial Management	3.0	4.0
OCHS 1441	Introduction to Safety for Operations Management*	3.0	2.0
OPMT 3460	Just in Time Manufacturing*	5.0	3.5
OPMT 4408	Math Models for Decision-making*	4.0	2.5
OPMT 4440	Implementing Quality Systems*	6.0	4.0
OPMT 4449	Industry Project*	18.0	12.0
OPMT 4460	Purchasing*	4.0	2.5
OPMT 4560	Logistics	3.0	4.0

\*denotes a half-term course

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 Glen Thorne, Weatherhaven Resources Ltd.

## Applied Operations Management

### One-Year Certificate Program (Full-time)

#### Program Aim

Prepares students for positions of greater responsibility in business operations, in all sectors of the economy, by building on their life skills through a program of business and technical training in the following areas: communication, critical thinking, personal management, teamwork, resource management and business process improvement. The program emphasizes the effective use of resources, critical analysis, oral and written communications, personal management skills, adaptability, creative thinking, computer literacy and teamwork skills.

#### Program Description

The program features four levels of training that can be taken while the student continues to work. Starting with the Associate Certificate Level, the program allows the student to advance to the levels of: Management Certificate, Certificate of Technology, and Senior Management Certificate.

The first two levels of the program are taken in a lock step format (all students at the same speed and duration) and can be completed in nine months. Students will be placed in a class of 25 students and spend the entire school year with classmates, interacting, working and learning as a team.

#### The Certificate Level (Levels 1 and 2) of the program feature:

1. An emphasis on business performance improvement skills such as problem-solving and creative thinking, communication (oral and written presentations), electronic office applications, teamwork and leadership, and numeracy.

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## Applied Operations Management cont.

2. All students must be employed and endorsed by their companies.
3. Classroom study will be limited to two evenings per week plus alternate Saturdays (An average of nine hours/week.)
4. A significant component of the study program will be done at the student's place of work. This relevancy and practicality of assignments will be of great benefit to both the student and the sponsoring company.
5. In addition to classroom contact, students will communicate with their classmates and instructors using the Internet. All students will be expected to have hardware and software to access the World Wide Web in order to use the computer mediated study software that will be provided.

The specialization level (Level 3) is offered through Part-time Studies, and allows you to select a career option consisting of six 36-hour courses. The third level courses can be completed on a self-paced basis. Many of the option streams in the third level ladder to further certification by industrial associations such as the American Production and Inventory Control Society, The American Society for Quality Control, etc.

The Senior Certificate level (Level 4) is offered through Part-time Studies, and provides a consulting opportunity for you to demonstrate and further develop skills by completing an industry practicum. Students gain valuable experience and further insights into your area of specialization.

### Entrance Requirements

High school graduation. English 12(C+). Math 11(C+).  
Employment endorsement letter, letter of intent and interview.

Students must submit a letter of application stating reasons for wishing to take the program and a letter of endorsement from an employer. Students must have a minimum of three years of documented positive work history. Students will be interviewed by a member of the faculty team.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

Opportunities for academic upgrading are available through BCIT Part-Time Studies for applicants who do not have required entrance requirements. Contact the program head at (604) 451-6749 for details. Please note: As this is a newly revised program, curriculum content is evolving. Please contact the program head at (604) 451-6749 for more information.

### Industrial Association Opportunities

Students are encouraged to apply for membership with industrial associations such as: Canadian Manufacturing Association, Canadian Association for Production and Inventory Control, American Society for Quality Control, Institute of Industrial Engineers, International Facilities Management Association, Canadian Materials Handling and Distribution Society, Canadian Professional Logistics Institute, Canadian Institute of Traffic and Transportation and Project Management Institute.

### Program Content — Applied Operations Management

#### Level 1 (15 weeks) September-December

	Total Hours
COMM 1910 Communications 1	76
OPMT 1900 Introduction to Operations Management	31
OPMT 1915 Problem Solving 1	68
OPMT 1930 Business Computer Skills	71

#### Level 2 (20 weeks) January - May

COMM 2910 Communications 2	50
OPMT 2915 Problem Solving 2	76
FMGT 1925 Financial Management*	30
HRMG 1995 Labour Management*	30
MKTG 1980 Marketing Management*	30
OPMT 1945 Materials Management*	40
OPMT 1950 Facilities Resource Management*	25
OPMT 1965 Quality Management*	25

\* denotes a half term course

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# Computing & Information Technologies



*“BCIT graduates from the Computer Systems Technology program have proven to be real assets at Seagate Software. BCIT’s focus on team projects and its two-year condensed coursework covers many of today’s most marketable technologies. We are continually looking for individuals like BCIT graduates who have proven technical aptitude and love a challenge. The program is comprehensive and prepares graduates for the dynamic, challenging and ever-changing work environment of hi-tech companies. BCIT graduates have unlimited potential within our organization.”*

*~ Monica Deane,  
Technical Recruiter,  
Seagate Software*

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## General Description

Computing and Information Technologies supplies graduates to the computer industry through a broad spectrum of programs and courses that includes a two-year diploma program, a Bachelor of Technology degree and an extensive selection of courses leading to certification through Part-time Studies.

## Administration

Ken Takagaki, B.A.(Hons.), C.M.A., C.D.P., Ph.D., Dean  
 Suzanne Geddes, B.A., B.Sc., Operations Manager  
 Pam Curtis, Secretary  
 Bill Howorth, B.Sc. (Comp. Sc.), Program Head,  
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 Rick Long, C.G.A., Manager, Information Technology Programs  
 Part-time Studies  
 Tony Wong, B.A.Sc., M.Eng., PEng.,  
 Service Course Coordinator  
 Ben Yu, B.Sc., M.Sc., Ph.D., Program Head, Advanced  
 Diploma, Bachelor of Technology Program Coordinator

## Computer Systems Technology

### Two-Year Diploma Program (Full-time)

#### Program Aim

Prepares graduates for entry-level computing positions in all sectors of industry including (but not limited to) business, engineering, manufacturing, health, and education. The CST Diploma program offers a diverse and flexible curriculum that emphasizes practical skills coupled with a strong work ethic to meet end-user needs.

Graduates achieve the necessary knowledge, skills and experience in programming, systems analysis and business to be successful in their chosen careers, and to become future managers, entrepreneurs and leaders in the computing field. A strong practical and academic foundation encourages continued lifelong learning. Graduates from the CST Diploma Program are eligible to enter the BCIT Bachelor of Technology in Computer Systems program.

#### Job Opportunities

Many graduates begin their careers as programmers and, after some experience, are promoted to 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 management, software and hardware sales, technical writing, training, and technical support. Some typical job titles include: Telecommunications Software Engineer, Database Administrator, Systems Integration Technologist, LAN/WAN Administrator, Software Developer, MIS Administrator, Systems Analysts and Multimedia Programmer.

## The Diploma Program

In first year, the program offers a mix of computer-related and general business courses. A variety of computers are used to introduce standard programming techniques, systems analysis and design, and standard software application packages. Accounting, mathematics, marketing, economics, statistics and business communication round out the first year.

In second year, a specialized option is chosen from one of the following: Applied Artificial Intelligence, Client Server, Database Management, Data Communications and Internetworking, Decision Systems, Information Systems, Multimedia Software Development and Technical Programming. A Combined Option, based on a selection of courses from across the specialized Options, is offered periodically. Option selection is competitive and is done at the end of the first year of study.

### Second-year Options:

Not all options listed will necessarily be offered in any given year. New course and option information may be obtained from the Computer Systems Technology office or from BCIT Registration and Information.

#### Applied Artificial Intelligence (AAI) Option:

The AAI Option specializes in structures and strategies for the solution of complex problems. Many real-world problems, such as scheduling and fleet routing, feature search spaces much too large to be explored exhaustively. AAI students typically use a variety of tools such as: Common LISP; CLOS; PROLOG; knowledge-system shells; genetic algorithms; neural networks, and VR to build proof-of-concept prototype applications that address such challenging problems. The concepts studied may be used to improve many computer systems - on applications as diverse as data mining, speech processing, computer gaming, or scheduling.

#### Client/Server Computing Option (C/S):

Offers specialized courses in the areas of Client/Server Computing. Distributed Computing and Network Computing. Students develop client/server based systems or distributed applications using state-of-the-art tools and technology. Topics include architecture, modeling and structural issues, inter-process communications, performance, reliability, scalability, consistency and security in a distributed system. Functional requirements, design methodologies and implementation details of Client/Server based systems or distributed systems are also discussed. Students obtain working knowledge of TCP/IP, Unix, Windows NT, SUN RPC, X Window Systems, CORBA, RDBMS, Visual Basic, Oracle, SQL Server, etc.

**Combined Option (CP):**

Allows the student to choose from a selection of specialized option courses and will be of particular interest to students seeking a broader training base than offered in the Option programs. The program also allows students to pursue individual interests within the context of the Diploma program. The Combined option may not be available in every academic year.

**Database Option (DBase):**

This program specializes in the design and implementation of database applications using modern database management systems. Students will work with a number of industry-standard DBM's such as Oracle, SQL/DS, DB2/2, Informix, Access and a variety of application development tools such as Delphi, Powerbuilder, Visual Basic and Visual C++ . Client/server application development, data warehousing, on-line analytical processing, object-orientated databases and other advanced database topics will also be covered.

**Data Communications & Internetworking Option (DComm):**

Offers highly specialized courses in the dynamic Data Communications and Internetworking field. Emphasis is placed on Multimedia communications, Internet-working (WWW), and Netcentric Computing. Students design and develop Internetworking software using TCP/IP protocol suite in the UNIX and Windows 95/NT environment. Multimedia communications software design and implementation includes applications that transfer video, audio, and graphical information in a client-server environment. Topics include implementation issues, modularity and efficiency for protocol implementation. Netcentric computing applications on the WWW are implemented using Java and Java applets. Also addressed are OSI protocol implementation issues and serial communications programming. LAN administration is taught using Novell Netware.

**Decision Systems Option (Decision):**

Specializes in scientific systems and computer modeling as an aid to decision making; emphasizes object-oriented systems/programming (C++/Java) and Windows/Motif programming. Topics include UNIX, computer simulation, linear/integer/dynamic programming, and Graphical User Interface (GUI) programming for Microsoft (MS) Windows, Motif and the Internet.

**Information Systems Option (Info):**

Provides a specialization involving system development in the information processing environment, with special emphasis on Business Systems and Software Engineering for medium and large computer systems.

**Multimedia Software Development (MM):**

This option is a "specialty" with significantly more program-specific content than other CST options. Students spend approximately 40 per cent of third level, and all of fourth level, on multimedia content design and production, with a significant practical and creative focus. The specialty courses will be offered at the Downtown campus.

Multimedia content is addressed in courses which address the principles and techniques used to develop digital media that delivers a specific message to the appropriate target audience. Multimedia production is addressed in courses dealing with the principles and techniques of instructional design, animation, and multimedia authoring. A systematic technical approach, to "gluing" the multimedia content together, is used throughout.

A substantial portion of the multimedia curriculum uses Java as the software development tool. This provides cross-platform delivery of content, and is oriented to the World Wide Web "style" of delivery. The students practice these skills with a significant multimedia project and a major practicum.

Students graduating under the Multimedia option will receive a "Diploma of Technology in Multimedia Software Development".

**Technical Programming Option (Tech):**

Specializes in software development for microcomputers. Addresses the principles and techniques for the creation of modern computer applications. The principles include the design and implementation of friendly user interfaces and on-line help systems. The techniques include improving performance through multi-threading, multi-tasking, and inter-process communications. Many of the assignments and projects will be graphical in nature. Most of the assignments and projects involve C or C++ programming. Each of the three Tech option courses has a term project; in two of the courses, students are allowed to select term projects that meet their own interests, within the guidelines of applying principles and techniques presented in the option courses. Some of the many previous term projects have included: network administration, CASE (computer aided software engineering), grading diamonds, tablature display – synchronized to a CD, human resources, inventory control and computer games.

**Program Length**

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

**Tuition Fees 1999/2000 (subject to change)**

\$4676.60 for the two-year program.

**Books and Supplies 1999/2000**

First year: \$2095; Second year: \$1350 (general estimated cost and subject to change). In addition, it is strongly recommended that all students in the program should own a computer suitable to run software used in their courses. Costs for such a computer will vary depending on configuration chosen but will likely range from approximately \$2000. - \$4000. Software purchases will increase this cost.

*continued next page*

## Computer Systems Technology cont.

### Entrance Requirements

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: High School graduation. English 12(C+) or better. Math 12(C+) or better. Computer Science 12(C+) or better, or Information Technology 12(C+) or better.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

Applicants may be required to demonstrate programming skills or aptitudes before acceptance into the program. For program information session dates contact BCIT Registration and Information at (604) 434-1610.

### Engineering Technology Entry (ETE)

This full-time, day school program provides academic upgrading to students wishing to enrol in engineering-based technology programs at BCIT.

For information about the ETE program, please refer to page 51 of this Calendar.

### Technology Entry with English Language Training Program (TEWELT)

This program is offered through Academic Studies and runs concurrently with the ETE January intake. Computer literacy, math and physics lectures are common courses with ETE, but TEWELT has its own extended communication course which focuses on skills needed by students who require English language training. For more information about the TEWELT program please refer to page 52 of this calendar.

### Second-Year Direct-Entry

Qualified applicants are considered for direct-entry into terms two (January) or three (September) of the program. Admission to either of these terms requires candidates to have skills and knowledge equivalent to those normally possessed by students at that point in the program. Candidates should be prepared to demonstrate their capabilities through the provision of transcripts and course outlines from post-secondary educational institutions, or through prior learning, or by successfully

completing BCIT Part-time Studies courses. Since the curriculum is revised annually, candidates should check with the Registrar's Office for detailed requirements. Direct-entry applicants should apply well in advance since seat availability is limited and to ensure they will have the time necessary to complete any prerequisite coursework.

### Prior Learning Assessment (PLA)

Many individuals have acquired skills and knowledge that are relevant to their field of study but they are not acknowledged in formal academic credentials. Examples would include those who have extensive on-the-job learning or learning which does not qualify for Transfer Credit. BCIT provides the opportunity for these individuals to demonstrate their expertise and to receive credit where appropriate. For more information on this service contact either a program advisor or the PLA coordinator.

### 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.).

### Diploma Program Completion

In order to be eligible for graduation, students must complete the Diploma Program requirements:

- within three years of the start of the program for students who enter the program in first year, or
- within three years of the start of second year for students who enter the program directly into second year.

Students who do not complete the diploma program requirements within the specified time period will be required to re-apply to for permission to complete the diploma program. BCIT cannot guarantee that courses taken prior to this re-application will be credited towards the current diploma of Technology.

### Additional Information

Applicants should enjoy using a logical and systematic approach to solve 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 strongly recommended. Specifications are provided at the beginning of term one.

The Computer Systems curriculum is under continual review to ensure it remains current. Current courses may therefore vary from this calendar. New course information may be obtained from the Computer Systems Technology web site, the departmental office, or from BCIT Registration and Information.

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 flyer or contact the coordinator of Part-time Studies at (604) 432-8470.

## Program: Computer Systems Technology

Level 1			hrs/wks	credits	option
COMP	1100	Enhanced Learning Skills	1.0	1.0	All
COMM	1114	Business Communication 1 for Computer Systems	3.0	3.0	All
COMP	1510	Programming Methods	5.0	5.0	All
COMP	1525	Intro to Object Oriented Prog Java	3.0	3.0	All
COMP	1710	Computer Applications Fundamentals	6.0	6.0	All
ECON	1150	Economic Issues	3.0	3.0	All
FMGT	1100	Accounting 1	4.0	4.0	All
OPMT	1113	Applied Mathematics	4.0	4.0	All

### Level 2

COMM	2214	Business Communication 2 for Computer Systems	4.0	5.5	All
COMP	2510	Procedural Programming in C	4.0	5.5	All
COMP	2530	Visual Tools *(A Term)	4.0	3.0	All
COMP	2710	Systems Analysis and Design	5.0	6.5	All
COMP	2720	Computer Organization/Architecture	4.0	5.5	All
FMGT	2100	Accounting 2	4.0	5.5	All
MKTG	1102	Essentials of Marketing *(B Term)	4.0	3.0	All
OPMT	1133	Statistics in Industry	4.0	5.5	All

\* denotes a half term (10 week) course

### Level 3 Common courses

COMP	2750	Introduction to Decisions Systems	3.0	3.0	All
COMP	3511	Object Oriented Programming in C++	6.0	6.0	All
COMP	3710	Relational Database Systems	4.0	4.0	All
COMP	3720	Introduction to Data Communications	3.0	3.0	All
COMP	3900	Computer Projects Practicum 1	5.0	5.0	All

Students take one of the following courses, depending upon option.

ELEX	2865	Introduction to PC Hardware	4.0	4.0	AAI, Decision, Tech, DComm, some CP
ORGB	2110	Organizational Behavior	3.0	3.0	Info, Dbase, C/S some CP
COMP	3961	Multimedia Communications	4.0	4.0	MM

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 I	5.0	5.0	Dbase
COMP	3930	Decision Systems	5.0	5.0	Decision
COMP	3940	Client/Server Computing I	5.0	5.0	C/S
COMP	3950	Technical Programming with Win32 API	5.0	5.0	Tech
COMP	3960	Multimedia Content	5.0	5.0	MM
COMP	3970	Applied Artificial Intelligence I	5.0	5.0	AAI
COMP	3980	Data Communications/Internetworking I	5.0	5.0	DComm

### Level 4 Common courses (except Multimedia)

BLAW	3600	Computers and the Law	3.0	4.0	
COMP	3730	Operating Systems Concepts *(A Term)	5.0	3.5	
COMP	4550	Advanced Programming Topics: OOPL *(A)	6.0	4.0	
COMP	4560	Advanced Programming Topics *(B Term)	6.0	4.0	
COMP	4710	Software Engineering/CASE * (B Term)	4.0	2.5	
COMP	4730	Topics in Operating Systems * (B Term)	5.0	3.5	
COMP	4900	Computer Projects Practicum 2	5.0	6.5	

Students take the following courses depending upon option. Combined program students select two courses from the list (seats limited).

continued next page

## Computer Systems Technology cont.

		hrs/wk	credits	option
<b>Applied Artificial Intelligence Option</b>				
COMP	4971 Applied Artificial Intelligence 2	4.0	5.5	
COMP	4975 PROLOG and Logic Programming	4.0	5.5	
<b>Client/Server Option</b>				
COMP	4941 Client/Server Computing 2	4.0	5.5	
COMP	4945 Special Topics in Client/Server	4.0	5.5	
<b>Database Option</b>				
COMP	4921 Database Systems 2	4.0	5.5	
COMP	4925 Special Topics in Database	4.0	5.5	
<b>Data Communications Option</b>				
COMP	4981 Data Communications/Internetworking 2	4.0	5.5	
COMP	4985 Special Topics in Data Communications/ Internetworking	4.0	5.5	
<b>Decision Systems Option</b>				
COMP	4931 GUI Programming (MS Windows)	4.0	5.5	
COMP	4935 Geographical Information Sys *(A Term)	4.0	2.5	or,
COMP	4936 GUI Programming (Motif) *(B Term)	4.0	2.5	(count as one course)
<b>Information Systems Option</b>				
(Students do not take COMP 4560 from the level 3 common courses list)				
COMP	4570 Intranet Planning and Development	6.0	4.0	
COMP	4911 Selected MIS Topics	4.0	5.5	
COMP	4915 Special Topics in MIS	4.0	5.5	
COMP	4937 GUI Programming (Internet)*(B Term)	4.0	2.5	
<b>Multimedia Option (level four)</b>				
COMP	4961 (A) Internetworking with Java	8.0	5.5	
COMP	4962 (A) Instructional Design for Multimedia	6.0	4.0	
COMP	4963 (A) Component and Media Frameworks	6.0	4.0	
COMP	4965 (A) Computer Animation Fundamentals	8.0	5.0	
COMP	4966 (B) Multimedia Development	6.0	4.0	
COMP	4967 (B) Multimedia Paradigms	6.0	4.0	
COMP	4969 (B) Multimedia Practicum	19.0	12.5	
<i>Students in the Multimedia Option take all of the level four courses mentioned above.</i>				
<b>Technical Programming Option</b>				
COMP	4951 Special Topics in Technical Programming	4.0	5.5	
COMP	4955 Technical Programming with MFC	4.0	5.5	
<b>Combined Program Option (select two)</b>				
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	or,
COMP	4936 (B) Graphical User Interface Programming (GUI)	4.0	2.5	(count as one course)
COMP	4941 Client/Server Computing 2	4.0	5.5	
COMP	4955 Special Topics in Micro Systems and Applications	4.0	5.5	
COMP	4975 PROLOG and Logic Programming	4.0	5.5	
COMP	4985 Special Topics in Data Communications/Internetworking	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 vary from this calendar. In addition, not all options listed will necessarily be offered in any given year. New course and option information may be obtained from the Computer Systems Technology office or from BCIT Registration and Information.

### Faculty and Staff

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 Bill Howorth, B.Sc., Program Head, Diploma Program and Combined Program  
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 T.B.A., Coordinator, Information Technology Programs (Part-time Studies)  
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 Benjamin Yu, B.Sc., M.Sc., Ph.D., Program Head, Advanced Diploma Bachelor of Technology Program Coordinator

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 D. Jennings, IBM  
 A. Klopfer, Consultant  
 S. McClain, Consultant  
 R. Nielsen, GNA Consulting  
 D. Wedge, Computer Law  
 C. Welman, Mainframe Entertainment

## Computer Systems

### Bachelor of Technology (Part-time Studies)

#### Introduction

The Bachelor of Technology in Computer Systems is a practitioner-oriented degree. It is a career enhancement degree designed to increase the breadth and depth of knowledge and practical skills for computer technologists, and facilitate graduates in widening their career opportunities or advancing in their career paths. Graduates are awarded a credential which the industry considers equivalent to a traditional university degree in Computer Science.

The program of study for the degree is composed of two components. The first is a Technical component comprising of 48.0 credits. This component comprises of coursework in the Computer Systems areas including core coursework, a specialty section (depth in one specific computer area), technical electives, management electives and practicums (or graduating projects). The second is Liberal Education component. This component is comprised of 12.0 credits of liberal education.

The Bachelor of Technology in Computer Systems is offered in a flexible delivery format to serve the needs of working professionals. Candidates can take course loads ranging from a minimum of three courses per year to an equivalent of full-time program of studies. Most courses are offered in the evening or on weekends. Some are offered in the day (depending on demand). Applicants can apply to the program at anytime throughout the year.

*continued next page*

## Computer Systems cont.

### Entrance Requirements

The entrance requirements for the Bachelor of Technology in Computer Systems are:

- BCIT Computer Systems Diploma of Technology or equivalent\*\*
- BUSA 7250: Management Skills and Applications (BCIT CST Diploma holders will have met this requirement through completion of the BCIT CST Diploma)
- English 12 or equivalent
- Two years of relevant work experience

(\*\* Equivalent courses will be assigned by the program head during the interview. These courses can be taken through evening or fast-track programs offered through Part-Time Studies)

### Application Procedure

Individuals interested in applying for entry into the Bachelor of Technology in Computer Systems should first arrange to be interviewed by the Bachelor of Technology CS Program Head, call (604) 432-8459 to arrange an interview. During this interview applicants may be required to complete several "upgrading" courses to ensure they have the necessary computer skills to enter the Degree program. Once these courses are completed BCIT welcomes applications to complete a BCIT Bachelor of Technology Application Form and send it, along with official transcripts, resume and application fee to the BCIT Admissions Department, 3700 Willingdon Ave, Burnaby, B.C., V5G 3H2.

Candidates may select and register for courses after reviewing each term's course offerings in the BCIT Part-time Flyer. Candidates should be aware that they may complete only 6.0 credits of BCIT Bachelor of Technology level coursework (eg. courses beginning with a 7000 or 8000 number) prior to acceptance into the degree program. Candidates are required to complete the Bachelor of Technology in Computer Systems within six years of starting their first degree level coursework).

### Structure of the Bachelor of Technology Program

Technical Component	48.0 credits
1. Core courses, or equivalents	9.0
2. Specialty courses	9.0
3. Technical Electives	6.0
4. Management Electives	6.0
5. Practicums	18.0
Liberal Education Component	12.0
<b>Total</b>	<b>60.0</b>

## Computer Systems Degree Program Structure

### 1. Core Courses

Students must complete all core courses, or equivalents (9.0 credits):

		credits
COMP 7036	Applied Research Methods in Software Development	3.0
COMP 7081	Technical Issues in Software Development	3.0
COMP 8081	Management Issues in Software Engineering	3.0

### 2. Specialty Courses:

Students must complete one specialty area (9.0 credits).

#### Data Communications

COMP 7005	Data Communication Principles	3.0
COMP 8005	Data Communications Applications	3.0
COMP 8505	Selected Topics in Data Communications	3.0

#### Computer Graphics

COMP 7011	Computer Graphics Fundamentals	3.0
COMP 8011	Photo-realism in Computer Graphics	3.0
COMP 8511	Selected Topics in Computer Graphics	3.0

#### Database

COMP 7071	Database Design	3.0
COMP 8071	Advanced Database Modelling	3.0
COMP 8571	Selected Topics in Database	3.0

#### Distributed Systems

COMP	Distributed Systems Principles	3.0
COMP	Distributed Systems Applications	3.0
COMP	Selected Topics in Distributed Systems	3.0

### 3. Technical Electives

Students must complete 6.0 credits of coursework in two alternate areas from their specialty or select from the courses listed below:

#### Non-Specialty Electives (may be taken to satisfy the "Technical Elective" section)

COMP 7401	Advanced Topics in Programming Methods	3.0
COMP 7615	Selected Topics in Computer Systems	3.0
COMP 7881	Advanced Topics in Software Engineering	3.0

### 4. Management Electives

Students are required to complete 6.0 credits of management electives. Please note that courses used to determine entrance into the Bachelor of Technology program, those that or are equivalent to course requirements of the BCIT CST Diploma program, may not be used to meet the management electives requirement.



## 5. Practicums

Students are required to complete two small or one large project. Proposals must be submitted to the program head for approval.

COMP 8045	Practicum 1	9.0
COMP 8046	Practicum 2	9.0

## Liberal Education Component

Students are required to complete 12.0 credits of liberal education coursework.

## Passing Grade

The passing grade is 50 per cent. However, students are only allowed to take the next course in the sequence for their specialization if they attain 60 per cent or higher.

## Additional Information

For the most current information package on the Bachelor of Technology Degree in Computer Systems, please contact:

Benjamin Yu, Ph.D., Program Head,  
Bachelor of Technology Program

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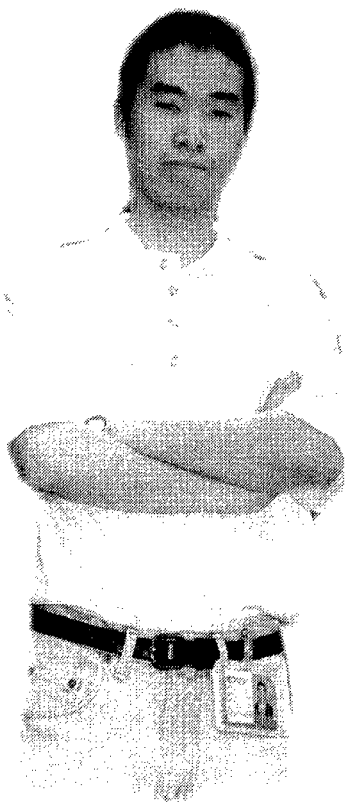
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W. Welsh, UCFV

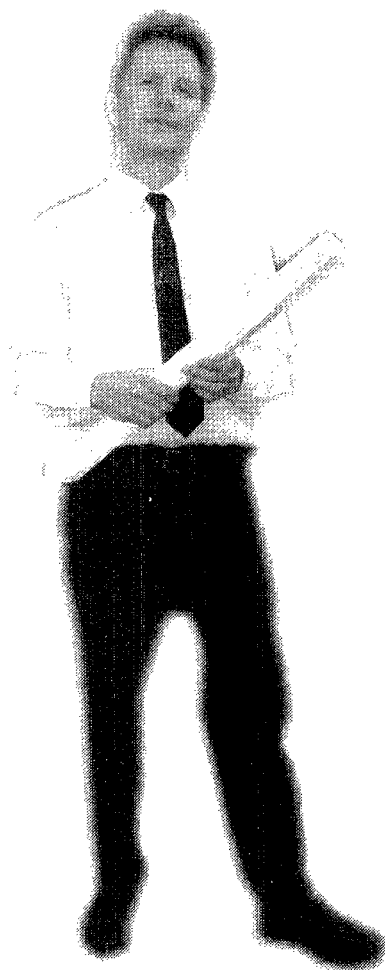


*"To date, I have worked on two, multi-million dollar projects. On both, I have had the opportunity to apply all of the technical skills I have obtained from graduating from my BCIT program. The rigorous BCIT course/work load and array of courses which were taught in my program has allowed me to easily adapt to the work environment of a high-technology company, as well as pick up new skills with no difficulty."*

— Ken Sato, 1997,  
Computer Systems Technology  
(Data Communications) graduate, Software Engineer,  
MacDonald Dettwiler



# Construction



*“Students from BCIT are very well trained from the apprenticeship stage to the completion of being full journeymen. I have hired many graduates from the program, and they have proven to be outstanding employees; the company has benefited greatly from their excellent workmanship.”*

*~ Dave Smith  
President, Brite Sheet Metal*

Construction

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## Administration

### Office of the Dean

Tony Barren, B.Sc., Ph.D., P.Eng., Dean  
 Shirley Conder, Administrative Assistant  
 Sherry Lipp, Operations Manager

### Program responsibilities:

Building Engineering Technology  
 Civil and Structural Engineering Technology  
 Bachelor of Technology in Construction Management  
 Bachelor of Technology in Environmental Engineering Technology

### Construction and Metal Industries Training

Rod MacNeill, Ed.D., M.B.A., Associate Dean  
 Joyce Glover, Secretary

### Program responsibilities:

Boilermaking  
 Carpentry  
 Drafting  
 Drywall Trades  
 Ironworking  
 Joinery (Cabinetmaker)  
 Painting and Decorating  
 Plumbing  
 Sheet Metal Working  
 Steamfitting  
 Steel Fabrication  
 Welding

## Construction Programs

### Building Engineering Technology

#### Two-Year Diploma Program (Full-time)

**Program is presently under curriculum review and is subject to change.**

Spiraling advances in technology have increased public expectations 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 Engineering 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, and electrical systems; the feasibility implications and the contractual and managerial processes.

Graduates of Building Engineering 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, technical representatives and sales staff 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 Engineering 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, achieve an architectural degree or pursue the "Architectural Technologist" program through the AIBC.

**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 option.

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.

In an Open House year (even years) both first-year and second-year students have a term project related to the Open House in order to experience a mini-construction project from start to finish. It is primarily student organized and directed, with input from staff.

### Program Length

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

### Tuition Fees 1999/2000 (subject to change)

\$4676.60 for the two-year program.

### Books and Supplies 1999/2000

Year 1: \$1800; Year 2: \$1900 (general estimated cost and subject to change).

### Post-graduation

Application for Bachelor of Technology in Construction Management: prerequisite is two years of relevant experience after graduation from Building Engineering Technology (BCIT) or approved alternative diploma program. Please see page 53 of this calendar.

### Accreditation

1. The Building Engineering 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.
2. The Building Engineering Technology diploma program is accredited by the Architectural Institute of British Columbia (AIBC). Full-time students may apply for Student Associate status with AIBC. Graduates are eligible for membership and may apply for registration as an Architectural Technologist after completing two years of relevant experience and the registration examination.
3. 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.

### Entrance Requirements

High school graduation. English 12(C). Math 12(C). Physics 11(C). Resume. Letter of Intent. Preference will be given to applicants who have: a grade (B) or better in the entrance requirements, post-secondary academic experience and/or construction industry experience.

The letter of intent must be a minimum 500-word description of your interest/background in the building industry, your motivation/purposes in pursuing the two-year diploma program and your career goals/aspirations. You may also include your own perspective/observations/opinions concerning the building industry in B.C.

The letter **MUST** be hand written or hand lettered.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

### Engineering Technology Entry (ETE)

This full-time, day school program provides academic upgrading to students wishing to enrol in engineering-based technology programs at BCIT.

For information about the ETE program, please refer to page 51 of this calendar.

### Technology Entry with English Language Training Program (TEWELT)

This program is offered through Academic Studies and runs concurrently with the ETE January intake. Computer literacy, math and physics lectures are common courses with ETE, but TEWELT has its own extended communication course that focuses on skills needed by students who require English language training. For more information about the TEWELT program please refer to page 52 of this calendar.

### Diploma Program Continuation

A student who fails or withdraws from one to three courses, in a specific term, may be required to move from "set" registration to course-by-course registration. In these cases the student will be notified by mail at the end of term where the failures or withdrawals occurred. Students will be required to meet with their program head during the first week of the following term to create an approved registration plan.

*continued next page*

## Building Engineering Technology cont.

Students on "set" registration will be given first priority for course placement, students who are registering on a course-by-course basis and who are registering for at least 60 per cent of a standard term course load will be given second priority, and students registering course-by-course with less than 60 per cent of a standard term course load will be given third priority for course placement.

A student who fails or withdraws from four or more courses any one term will be required to withdraw from the program. Prior to applying for re-acceptance the student must complete the failed course(s) successfully through BCIT Part-time Studies, or on a program head approved alternate route (in writing). Completion of the missing course(s) does not guarantee re-acceptance into the program.

A student who fails to complete a first year course for a second time may be required to withdraw from the program for a period of one academic year. Prior to applying for re-acceptance the student must complete the failed course successfully through BCIT Part-time Studies, or on a program head approved alternate route. Completion of the missing course does not guarantee re-acceptance into the program.

A student who fails to complete a second-year course for a second time will be required to enter into a re-admission contract with the program head of the Department. This contract may require the student to repeat pre-requisite courses (even if they had previously been completed successfully) prior to a third, and final, attempt to complete the second year course.

### Diploma Program Re-Admission

Students who have been withdrawn from the program due to failures, or have left of their own accord, must apply for re-acceptance when they are ready to re-enter full time study (at least a 60 per cent course load). BCIT recommends that you apply as early as possible, however space is limited and where a program area receives more eligible applicants than there are seats available, then the department may select those applicants considered to have the strongest chance of success in the program.

### Diploma Program Completion

In order to be eligible for graduation, students must complete the Diploma Program requirements:

1. within 5 years of the start of the program for students who enter the program in first year, or
2. within 3 years of the start of second year for students who enter the program directly into second year.

Students who do not complete the Diploma Program requirements within the specified time period will be required to re-apply to the BCIT Admissions Department for permission to complete the diploma program. BCIT cannot guarantee that courses taken prior to this re-application will be credited towards the current Diploma of Technology.

## Program Content — Building Engineering Technology

Level 1 (15 weeks)				hrs/wk	credits
BLDG	1000	Building Drafting		3.0	3.0
BLDG	1050	Construction Materials and Processes I		3.0	3.0
BLDG	1200	Building Construction I		6.0	6.0
BLDG	1400	Introduction to Computers		3.0	3.0
CIVL	1200	Building Structures I		3.0	3.0
COMM	1140	Technical Communication for Building		3.0	3.0
MATH	1401	Technical Mathematics for Building		5.0	5.0
PHYS	1140	Applied Physics for Building I		4.0	4.0

Level 2 (Term 2A 10 weeks)				hrs/wk	credits
BLDG	2000	Planning		3.0	4.0
BLDG	2050	Construction Materials and Processes 2*		2.0	1.5
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	2255	Technical Communication 2 for Building		3.0	3.5
MATH	2401	Analytic Geometry & Calculus		5.0	6.5
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	4.0
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	2255	Technical Communication 2 for Building		2.0	3.5
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	3350	Construction Specifications I		2.0	2.0
BLDG	3500	Codes and Regulations		2.0	3.0
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 I		6.0	6.0
BLDG	3050	Economics - Construction Operations Option I		6.0	6.0
BLDG	3100	Building Science Option I		6.0	6.0

**Level 4 (Term 4A 10 weeks)**

<b>Core Courses</b>			<b>hrs/wk</b>	<b>credits</b>
BLDG	4200	Building Construction 4	6.0	8.0
BLDG	4303	Construction Estimating 3	4.0	3.0
BLDG	4400	Construction Management *	3.0	2.0
BLDG	4500	Codes and Regulations	3.0	2.0
CIVL	4203	Building Structures 4*	3.0	2.0
ELEX	2805	Illumination*	2.0	1.5
MSYS	3980	Plumbing Systems*	2.0	1.5

<b>Options</b>			<b>hrs/wk</b>	<b>credits</b>
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)**

<b>Core Courses</b>			<b>hrs/wk</b>	<b>credits</b>
BLDG	4200	Building Construction 4	6.0	8.0
BLDG	4304	Construction Estimating 4	3.0	2.0
BLDG	4350	Construction Specifications 2	2.0	1.5
BLDG	4505	Building Acoustics*	2.0	1.5
OPMT	1260	Management Engineering I for Building	3.0	2.0
SURV	1120	Survey for Building*	3.0	2.0

<b>Options</b>			<b>hrs/wk</b>	<b>credits</b>
BLDG	4220	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

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**Advisory Committee Members**

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 D. Dalzell, Keith Panel Systems  
 T. Hamilton, E.W. Hamilton Ltd.  
 J. Hiebert, Task Construction Management Inc., Chair  
 D. James, David H. James Ltd.  
 G. Johnson, B.C. Building Corporation  
 M. Kaustinen, Britco Structures Division  
 P. Kernan, City of Vancouver  
 K. Kompauer, Canadian Portland Cement Association  
 B. Light  
 N. McNeill, B.C. Hydro  
 E. Stregger, Costex Management Inc.

**Civil and Structural  
Engineering Technology****Two-Year Diploma Program (Full-time)**

*Program is presently under curriculum review and is subject to change.*

Civil and Structural technologists are involved in the design and construction of municipal works, residential development, industrial and commercial buildings, highways, bridges, railways, dams, power developments, canals, docks, harbors, and environmental protection and remediation works. A career in this field allows the technologist to fully develop his or her creative potential, providing the opportunity for involvement in all phases of most projects, from design to inspection of the finished job.

**Job Opportunities**

Graduates find employment as surveyors, material testing lab technicians, field inspectors, construction supervisors, designers, detailers, and investigation and construction technologists. More than 80 per cent of graduates find work related to their training within six months of graduation. There are an abundant variety of possible career paths in contracting, consulting, and government. A number of graduates have reached senior positions in major engineering organizations or even started their own enterprises. Others are project managers and supervisors in engineering, contracting, surveying or architectural companies.

**The Program**

This diverse and stimulating program provides a broad foundation of knowledge, allowing students opportunities to develop their critical thinking and creative abilities. Hands-on testing, communication, problem-solving, and organizational skills are all emphasized. Many of the courses, particularly in the second year, utilize industry-based projects to reinforce theoretical and analytical concepts in an applied setting.

*continued next page*

## Civil and Structural Engineering Technology cont.

In second year, students must choose an option, which provides additional exposure to one of four principal areas in civil and structural technology. These include Geotechnical, 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) 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. Part-time day studies are available at all levels above Level 1.

### Tuition Fees 1999/2000 (subject to change)

\$4676.60 for the two-year program.

### Books and Supplies 1999/2000

Year 1: \$2100; Year 2: \$1600 (general estimated cost and subject to change).

### 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 successful completion of a bridging program for either location.

Alternatively, graduates may consider entering the Bachelor of Technology program in Environmental Engineering Technology. 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 Engineering 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.

### Entrance Requirements

High school graduation. English 12(C). Math 12(C). Physics 11(C).

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

### Engineering Technology Entry (ETE)

This full-time, day school program provides academic upgrading to students wishing to enrol in engineering-based technology programs at BCIT.

For information about the ETE program, please refer to page 51 of this calendar.

### Technology Entry with English Language Training Program (TEWELT)

This program is offered through Academic Studies and runs concurrently with the ETE January intake. Computer literacy, math and physics lectures are common courses with ETE, but TEWELT has its own extended communication course that focuses on skills needed by students who require English language training. For more information about the TEWELT program please refer to page 52 of this calendar.

### Program Content — Civil and Structural Engineering Technology

#### Core Courses

Level 1	(15 weeks)	hrs/wk	credits
CIVL 1000	Statics	6.0	6.0
CIVL 1001	Graphical Communication I	2.0	2.0
CIVL 1040	Hydrology	3.0	3.0
CIVL 1080	Construction Materials I	3.0	3.0
COMM 1135	Technical Communication I	3.0	3.0
MATH 1421	Technical Mathematics for Civil and Structural	5.0	5.0
PHYS 1142	Physics for Civil & Structural I	5.0	5.0
SURV 1130	Surveying for Civil Structural I	3.0	3.0

Level 2A	(10 weeks)	hrs/wk	credits
CIVL 2002	Mechanics of Materials*	6.0	4.0
CIVL 2004	Civil Computer Applications	3.0	4.0
CIVL 2041	Hydraulics I	3.0	4.0
CIVL 2081	Construction Materials 2*	3.0	2.0
COMM 2242	Technical Communication 2	3.0	4.0
MATH 2421	Calculus for Civil and Structural	5.0	6.5
PHYS 2142	Physics for Civil and Structural 2	4.0	5.5
SURV 2230	Surveying for Civil and Structural 2	3.0	4.0



Level 2B (10 weeks)		hrs/wk	credits
CIVL	2004 Civil Computer Applications	3.0	4.0
CIVL	2007 Computer Aided Design 1*	3.0	2.0
CIVL	2041 Hydraulics 1	3.0	4.0
CIVL	2160 Elementary Structural Design*	7.0	4.0
COMM	2242 Technical Communication for Civil and Structural	3.0	4.0
MATH	2421 Calculus for Civil and Structural	5.0	6.5
PHYS	2142 Physics for Civil and Structural	3.0	5.5
SURV	2230 Surveying for Civil and Structural 2	3.0	4.0

**Second-year Program Options**  
**Set A - Geotechnical Highways**

Level 3 (15 weeks)		hrs/wk	credits
CIVL	3007 Computer Aided Design 2	3.0	3.0
CIVL	3042 Hydraulics 2	3.0	3.0
CIVL	3082 Soil Mechanics I	6.0	6.0
CIVL	3090 Project Proposal	1.0	1.0
CIVL	3164 Structural Design General	6.0	6.0
COMM	3342 Technical Communication	2.0	2.0
MATH	3421 Applied Linear Algebra and Calculus	4.0	4.0
OPMT	1180 Engineering Economics	2.0	2.0
SURV	3330 Surveying for Civil and Structural 3	3.0	3.0

Level 4 A (10 weeks)		hrs/wk	credits
CIVL	3122 Basic Subdivision Planning *	3.0	2.0
CIVL	4008 Civil Engineering Construction	3.0	4.0
CIVL	4009 Construction Contract Law	1.0	1.5
CIVL	4020 Projects	3.0	4.0
CIVL	4083 Soil Mechanics 2*	6.0	4.0
CIVL	4085 Geotechnics	3.0	6.0
CIVL	4122 Municipal Services	3.0	4.0
COMM	4442 Technical Communication	2.0	2.5
MATH	4421 Statistics for Civil and Structural	3.0	4.0
SURV	4430 Surveying for Civil and Structural 4	3.0	4.0

Level 4 B (10 weeks)		hrs/wk	credits
CIVL	3005 Highway Design Basic *	3.0	2.0
CIVL	3123 Urban Street Design *	3.0	2.0
CIVL	4008 Civil Engineering Construction	3.0	4.0
CIVL	4009 Construction Contract Law	1.0	1.5
CIVL	4020 Projects	3.0	4.0
CIVL	4085 Geotechnics	6.0	6.0
CIVL	4122 Municipal Services	3.0	4.0
COMM	4442 Technical Communication	2.0	2.5
MATH	4421 Statistics for Civil and Structural	3.0	4.0
SURV	4430 Surveying for Civil and Structural 4	3.0	4.0

**Set B - Water Resources**

Level 3 (15 weeks)		hrs/wk	credits
CIVL	3007 Computer Aided Design 2	3.0	3.0
CIVL	3042 Hydraulics 2	3.0	3.0
CIVL	3082 Soil Mechanics I	6.0	6.0
CIVL	3090 Project Proposal	1.0	1.0
CIVL	3164 Structural Design General	6.0	6.0
COMM	3342 Technical Communication	2.0	2.0
MATH	3421 Applied Linear Algebra and Calculus	4.0	4.0
OPMT	1180 Engineering Economics	2.0	2.0
SURV	3330 Surveying for Civil and Structural 3	3.0	3.0

Level 4 A (10 weeks)		hrs/wk	credits
CIVL	3122 Basic Subdivision Planning *	3.0	2.0
CIVL	4008 Civil Engineering Construction	3.0	4.0
CIVL	4009 Construction Contract Law	1.0	1.5
CIVL	4020 Projects	3.0	4.0
CIVL	4044 Water Resources	3.0	6.0
CIVL	4083 Soil Mechanics 2* Services	6.0	4.0
COMM	4442 Technical Communication	3.0	4.0
MATH	4421 Statistics for Civil and Structural	3.0	4.0
SURV	4430 Surveying for Civil and Structural 4	3.0	4.0

Level 4 B (10 weeks)		hrs/wk	credits
CIVL	3005 Highway Design Basic *	3.0	2.0
CIVL	3121 Urban Street Design *	3.0	2.0
CIVL	4008 Civil Engineering Construction	3.0	4.0
CIVL	4009 Construction Contract Law	1.0	1.5
CIVL	4020 Projects	3.0	4.0
CIVL	4044 Water Resources	6.0	6.0
CIVL	4122 Municipal Services	3.0	4.0
COMM	4442 Technical Communication	2.0	2.5
MATH	4421 Statistics for Civil and Structural	3.0	4.0
SURV	4430 Surveying for Civil and Structural 4	3.0	4.0

**Set C - Construction**

Level 3 (15 weeks)		hrs/wk	credits
CIVL	3007 Computer Aided Design 2	3.0	3.0
CIVL	3015 Construction I	3.0	3.0
CIVL	3042 Hydraulics 2	3.0	3.0
CIVL	3090 Project Proposal	1.0	1.0
CIVL	3120 Subdivision Planning	3.0	3.0
CIVL	3161 Structures I	6.0	6.0
COMM	3342 Technical Communication	2.0	2.0
MATH	3421 Applied Linear Algebra and Calculus	4.0	4.0
OPMT	1180 Engineering Economics	2.0	2.0
SURV	3330 Surveying for Civil and Structural 3	3.0	3.0

continued next page

## Civil and Structural Engineering Technology cont.

Level 4 A	(10 weeks)	hrs/wk	credits
CIVL 3081	Soil Mechanics I Basic *	6.0	4.0
CIVL 3123	Urban Street Design	2.0	2.0
CIVL 4009	Construction Contract Law	1.0	1.5
CIVL 4016	Construction 2 *	3.0	2.0
CIVL 4020	Projects	3.0	4.0
CIVL 4122	Municipal Services	3.0	4.0
CIVL 4162	Structures 2	3.0	4.0
COMM 4442	Technical Communication	2.0	2.5
MATH 4421	Statistics for Civil and Structural	3.0	4.0
SURV 4430	Surveying for Civil and Structural 4	3.0	4.0

Level 4 B	(10 weeks)	hrs/wk	credits
CIVL 3005	Highway Design Basic *	3.0	2.0
CIVL 4009	Construction Contract Law	1.0	1.5
CIVL 4020	Projects	3.0	4.0
CIVL 4083	Soil Mechanics 2*	6.0	4.0
CIVL 4122	Municipal Services	3.0	4.0
CIVL 4162	Structures 2	3.0	4.0
CIVL 4166	Structural Detailing*	3.0	2.0
COMM 4442	Technical Communication	2.0	2.5
MATH 4421	Statistics for Civil and Structural	3.0	4.0
SURV 4430	Surveying for Civil and Structural 4	3.0	4.0

### Set D - Structure

Level 3	(15 weeks)	hrs/wk	credits
CIVL 3007	Computer Aided Design 2	3.0	3.0
CIVL 3015	Construction I	3.0	3.0
CIVL 3042	Hydraulics 2	3.0	3.0
CIVL 3090	Project Proposal	1.0	1.0
CIVL 3120	Subdivision Planning	3.0	3.0
CIVL 3161	Structures I	6.0	6.0
COMM 3342	Technical Communication	2.0	2.0
MATH 3421	Applied Linear Algebra and Calculus	4.0	4.0
OPMT 1180	Engineering Economics	2.0	2.0
SURV 3330	Surveying for Civil and Structural 3	3.0	3.0

Level 4 A	(10 weeks)	hrs/wk	credits
CIVL 3081	Soil Mechanics I Basic *	6.0	4.0
CIVL 3123	Urban Street Design	2.0	2.0
CIVL 4009	Construction Contract Law	1.0	1.5
CIVL 4016	Construction 2 *	3.0	2.0
CIVL 4020	Projects	3.0	4.0
CIVL 4162	Structures 2	3.0	4.0
CIVL 4163	Structures 3	3.0	4.0
COMM 4442	Technical Communication	2.0	2.5
MATH 4421	Statistics for Civil and Structural	3.0	4.0
SURV 4430	Surveying for Civil and Structural 4	3.0	4.0

Level 4 B	(10 weeks)	hrs/wk	credits
CIVL 3005	Highway Design Basic *	3.0	2.0
CIVL 4009	Construction Contract Law	1.0	1.5
CIVL 4020	Projects	3.0	4.0
CIVL 4083	Soil Mechanics 2*	6.0	4.0
CIVL 4162	Structures 2	3.0	4.0
CIVL 4163	Structures 3	3.0	4.0
CIVL 4166	Structural Detailing*	3.0	2.0
COMM 4442	Technical Communication	2.0	2.5
MATH 4421	Statistics for Civil and Structural	3.0	4.0
SURV 4430	Surveying for Civil and Structural 4	3.0	4.0

\*denotes half-term course

## Civil and Structural Engineering Technology Faculty and Staff

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K. Fyvie, A.Sc.T., Terra Engineering Ltd.

B. Jebson, A.Sc.T., Fraser River Pile and Dredge Ltd.

J. Kupskey, PEng., Paragon Engineering Ltd., Chair

J. Martens, A.Sc.T., R.F. Binnie and Associates Ltd.

J. Miller, Dipl.T., President, Miller Construction

J. Pao, PEng., Bogdonov Pao Associates Ltd.

T. Pataky, PEng., B.C. Hydro

Sinclair, PEng., City of Burnaby

## Construction Management

### Bachelor of Technology Degree (Part-time)

The construction sector increasingly requires individuals who can participate at the professional level as part of a construction management team. This Construction Management degree completion program will provide participants with structured management and leadership techniques that will provide the basis for broader management decisions as well as on-site leadership in construction operations. The flexible delivery format and the direct relevance of the course materials make this program distinctive for those aspiring to be part of the management team. Existing team members may wish to broaden their knowledge and skills and participate on the basis of continuing professional development.

### Job Opportunities

Individuals completing this program of studies will be well prepared to function as one of the key members of the construction management team. The advanced knowledge presented in such topics as Project Controls, Legislation, Finance, Leadership, Industrial Relations and Management of Project Stakeholders reflects the scope of knowledge necessary to make the correct decisions associated with national and international construction projects. In this capacity, you will be able to help direct and manage a multi-disciplined construction project to a satisfactory conclusion. While most career opportunities will likely be directly involved with construction companies, other opportunities will occur in both the development and consulting areas.

### The Program

Developed with the guidance of senior industry representatives, the curriculum has been divided into the following sections; Construction Controls and Techniques, Construction Management, Stakeholder Management, an Industry based Project and liberal education courses. Presented by some of industry's leading specialists (e.g. Dr. Roger Woodhead PEng and Dr. Robert Gray PEng), the topics will be both challenging and practical. Graduates of the program will be able to methodically and rationally select or develop suitable construction procedures, schedule, manage, utilize human resources and equipment within the complex environment of labor relations and business decision-making.

### Program Length

Presented in a six-week modular format, most participants will typically register in evening courses offered at the Burnaby campus. This will allow individuals to maintain full-time employment while working towards completing their degree. The rate of progress through the program will be dependent on the aggressiveness of each participant. Most individuals will likely take three to four years to complete their studies, but have up to 6 years to complete all the program requirements.

The scheduling of courses will be increased as the program matures so as to allow individuals to start some of the courses at almost any point in time throughout the academic year. It is also anticipated that an "accelerated mode" of study will be introduced in the near future. This will allow participants to complete the majority of courses in one, longer academic year, with the balance of their studies being completed when they have returned to the workforce. Current initiatives at BCIT indicate that a computer mediated communication (CMC) mode of delivery will likely be available that will allow participants to study using the electronic media as the mode of delivery.

### Accreditation

Recognition of this Bachelor of Technology degree as a qualification for advanced technical and management positions is anticipated from related professional groups and industry associations. Negotiations are also ongoing with such groups as the Canadian Construction Association as well as universities for entrance in Master's programs in related disciplines.

### Entrance Requirements

The minimum entrance requirement is:

- a recognized Diploma of Technology in a related engineering or science discipline,
- or a degree in Engineering, Architecture, Applied Science or related field,
- or through Prior Learning Assessment and Recognition (PLAR) of documented work history in conjunction with academic studies of a relevant nature,
- 2 years relevant work experience
- English 12 or equivalent

All participants will be required to meet with the program head to review the initial application for acceptance. Supplemental courses may be required in order to fulfill the educational background required for practice in the engineering and construction industry.

### Program Structure

1. Technical Component	48.0
Construction Controls and Techniques	14.0
Management in Construction	10.0
Stakeholder Management	8.0
Electives	3.0
Industry Project	12.0
2. Liberal Education Component	12.0
<b>Total</b>	<b>60.0</b>

*continued next page*

## Construction Management cont.

### Program Content — Construction Controls and Techniques (14.0 credits required)

#### Part I

CMGT 7100	Construction Project Controls 1	1.0
CMGT 7110	Construction Project Controls 2	1.0
CMGT 7120	Construction Project Controls 3	1.0
CMGT 7140	Construction Statistics 1	1.0
CMGT 7150	Construction Statistics 2	1.0
CMGT 7200	Construction Mgt. of Equip & Plant 1	1.0
CMGT 7210	Construction Mgt. of Equip & Plant 2	1.0
CMGT 7220	Health & Safety in Construction	1.0
CMGT 7230	Quality Assurance and Control 1	1.0
CMGT 7240	Quality Assurance and Control 2	1.0
CMGT 7250	Quality Assurance and Control 3	1.0

#### Part II

CMGT 8200	Special Techniques in Large Constr Projects 1	1.0
CMGT 8210	Special Techniques in Large Constr Projects 2	1.0
CMGT 8220	Special Techniques in Large Constr Projects 1	1.0

### Management in Construction (10.0 credits required)

#### Part I

CMGT 7300	Construction Finance 1	1.0
CMGT 7310	Construction Finance 2	1.0
CMGT 7320	Construction Finance 3	1.0
BUSA 7250	Management Skills and Applications	3.0
CMGT 7420	Construction Law and Ethics 1	1.0
CMGT 7430	Construction Law and Ethics 2	1.0

#### Part II

CMGT 8430	Management of a Construction Enterprise 1	1.0
CMGT 8440	Management of a Construction Enterprise 2	1.0
CMGT 8450	International Construction Management	1.0

### Stakeholder Management (8.0 credits required)

#### Part I

CMGT 7530	Leadership and Interpersonal Skills	2.0
CMGT 7600	Industrial Relations in Construction 1	1.0
CMGT 7610	Industrial Relations in Construction 2	1.0
CMGT 7640	Environmental Issues in Construction 1	1.0
CMGT 7650	Environmental Issues in Construction 2	1.0

#### Part II

CMGT 8600	Management of Project Stakeholders	2.0
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### Electives (3.0 credits)

Students may select three additional management credits from any combination of other Bachelor of Technology courses at BCIT. Pre-approval of course selection is required from your program head.

### Industry Project (12.0 credits required)

All students seeking to graduate from the program must successfully complete an industry-sponsored project. The objective of the project is to allow students to apply specialty knowledge in a real-life situation, study or applied research activity in conjunction with an industry sponsor and an academic mentor. The project assignment should contain elements that are considered innovative, experimental or exploratory in nature. The participant will be responsible for securing an industry sponsor with expertise in the project area.

CMGT 7800	Project Reports	1.0
CMGT 7829	Project Proposal	1.0
CMGT 7840	Technical Presentations	2.0
CMGT 8800	Applied Research Project	8.0

### Liberal Education (12.0 credits)

All students will be required to achieve these credits in accordance with the BCIT policy on Liberal Education course requirements. Information regarding the topic areas and/or eligibility for transfer credits may be obtained from the Registrar's Office.

### Faculty and Administrative Staff

Tony Barren, Ph. D., PEng., Dean, Construction Programs  
Phil Cunnington, PEng., Program Head  
Jim Klipa, PEng.

### Sessional Instructors

Richard Alexander, B.B.A.  
Andrew Collins, QS.  
Darwin Fraser, B.Com.  
Robert Gray, Ph.D., PEng.  
Chris Makela, PEng., M.Com.  
Fred Mandl, B.Sc. MBA  
Al Morgan, PEng.  
Brian Samuels, PEng., MBA, LL.B.  
Roger Woodhead, Ph.D., PEng.  
Yoga Yogendran, Ph.D., PEng.

### Advisory Committee Members

#### Construction Management Degree

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K. Gissing, Canadian Portland Cement Association  
D. Louvier, The Dominion Company  
C. Makela, Accuron Construction Ltd.  
A. Marshall, Marshall Consultants  
D. Meyers, Bentall Group  
V. Muir, HA Simons Ltd.  
N. Thomson, Whelan Mechanical Installations  
R. Woodhead, Woodhead Consultants Inc.  
Y. Yogendran, Powertech Labs Inc.  
E. Zuccolin, Fraser River Pile & Dredging

## Environmental Engineering Technology

### Bachelor of Technology Degree (Compressed and Part-time) (604) 451-6906/432-8344

The Environmental Engineering Technology program is intended to provide the additional skills and knowledge that engineering and science graduates require to successfully work on environmental assignments such as site remediation, site audits, waste treatment facilities, wastewater management, geohydrology, residuals management, solid waste management, industrial air pollution and recycling projects.

### Job Opportunities

Graduates are well prepared to function as a member of a multi-disciplinary team addressing the environmental challenges faced by the industry. Working as a member of an environmental team comprised of engineers, chemists, biologists and microbiologists, graduates of the environmental engineering technology program will be uniquely positioned to operate across disciplinary boundaries.

### The Program

Recognizing the wide range of science and engineering backgrounds associated with the industry, this program is structured to accommodate the requirements from a diverse range of applicants. The blend of common core topics, major elective studies, management courses, the industry sponsored project and liberal education courses will provide a unique balance of skill sets that will prepare candidates for a broader range of career opportunities. While many of the participants are pursuing this degree credential, others are upgrading their skills as professional development to complement other professional and university credentials.

### Program Length

Presented in a modular six-week format, students can choose to participate in either the Planned Program (an accelerated mode of study) or the more traditional night school mode of study. Students in the Planned Program mode can expect to complete their technical courses after a one-year period of intense study. The industry-sponsored project and liberal education courses (if required), will likely be completed during employment after completion of the technical courses. For those who choose to maintain their full-time employment while continuing their studies, they may register in just evening classes as well as the occasional afternoon class as circumstances permit. Students may proceed at a pace of their choice, but must complete the program within six years.

### Accreditation

Bachelor of Technology degree studies will be recognized as a qualification for advanced technical positions by employers and for advanced certification by professional associations.

Recognition and accreditation of this program with related environmental industry associations and professions continues.

### Entrance Requirements

The minimum entry requirement is:

- a recognized Diploma of Technology in an engineering or science discipline or a related degree in engineering or science.
- two years of relevant work experience, subject to departmental approval
- English 12 or equivalent

Students are required to meet with the program head to review the initial course requirements to supplement the student's educational background in engineering and/or science.

For more information about Bachelor of Technology degree studies at BCIT please refer to page 53 of this calendar.

### Program Structure

- I. Common Core Courses (27 credits minimum)  
(8 credits min. required in addition Credits to eligible transfer credits)

			credits
EENG	7700	Environmental Case Studies	1.0
EENG	7710	Chemistry 1 for EET	1.0
EENG	7711	Chemistry 2 for EET	1.0
EENG	7712	Organic Chemistry for EET	1.0
EENG	7713	Environmental Analytical Chemistry	1.0
EENG	7714	Methods of Wastewater Analysis2.0	
EENG	7715	Hydraulics 1 for EET	1.0
EENG	7716	Soils and Groundwater for EET	1.0
EENG	7717	Hydrology for EET	1.0
EENG	7718	Hydraulics 2 for EET	1.0
EENG	7719	Survey Techniques for EET	1.0
EENG	7720	Applied Microbiology	1.0
EENG	7721	Applied Toxicology	1.0

Students will be required to complete all the required common core courses prior to entering into their choice of major elective studies. Some exceptions may be possible, based on transfer credits from prior studies, and will require departmental approval.

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## Environmental Engineering Technology cont.

### Major Elective Studies (19 credits minimum from four topic areas)

Ground Water (5 credits)		credits
EENG	7740 Physical Hydrogeology	1.0
EENG	7741 Contaminant Hydrogeology	2.0
EENG	7742 Groundwater Modelling: Numerical Methods	2.0

Water Treatment (6 credits)		credits
EENG	8750 Municipal Wastewater Characteristics	1.0
EENG	8751 Municipal Wastewater Treatment Processes	1.0
EENG	8752 Industrial Wastewater Treatment 1	1.0
EENG	8753 Industrial Wastewater Treatment 2	1.0
EENG	8754 Industrial Wastewater Treatment 3	1.0
EENG	8755 Drinking Water Treatment	1.0

Solid Waste (4 credits)		credits
EENG	8760 Solid Waste Management	1.0
EENG	8761 Recycling and Reduction Techniques	1.0
EENG	8762 Landfill Design and Operation	1.0
EENG	8763 Environmental Controls for Landfills	1.0

Residuals Management (4 credits)		credits
EENG	8768 Advanced Residuals Management	2.0
EENG	8769 Advanced Residuals Treatment	2.0

Contaminated Sites (5 credits)		credits
EENG	8770 Environmental Site Assessment	1.0
EENG	8771 Contaminated Site Investigation Process	1.0
EENG	8772 Site Remediation and Risk Assessment Process	1.0
EENG	8773 Sampling Methods for Contaminated Sites	1.0
EENG	8774 Site Remediation Technologies	1.0

Air Quality Management (6 credits)		credits
EENG	8790 Air Quality Management	2.0
EENG	8791 Industrial Air Pollution Control Techniques	2.0
EENG	8792 Air Quality Monitoring and Testing	2.0

Integrated Resource Management (5 credits)		credits
EENG	8801 Terrain Map/Erosion Processes	1.0
EENG	8802 Forest Road Design & Construction	1.0
EENG	8803 Forest Road Rehabilitation	1.0
EENG	8804 Hydrological Map & Hydrometric	1.0
EENG	8805 Stream Channel Protection	1.0

Advanced Process Technologies (6 credits)		credits
EENG	8810 Pulp and Paper Industry for EET	2.0
EENG	8811 Mining and Extractive Metal Industry	2.0
EENG	8812 Petroleum Industry	2.0

Advanced Chemical Analysis (6 credits)		credits
EENG	8820 Separation and Identification Techniques	2.0
EENG	8822 Analytical Atomic Spectroscopy 1	1.0
EENG	8823 Analytical Atomic Spectroscopy 2	1.0
EENG	8824 Gas Chromatography and Mass Spectrometry	2.0

### 2. Management (7 credits required)

Required (7 credits)		credits
BUSA	7250 Management Skills Applications	3.0
EENG	8780 Environmental Law 1	1.0
EENG	8781 Risk Assessment	1.0
EENG	8782 Value Analysis and Environmental Mgmt	1.0
EENG	8783 Risk Management	1.0

### Plus two additional credits from either the Technology Management program in the Engineering Technology, or below:

		credits
EENG	8760 Solid Waste Management	1.0
EENG	8761 Recycling and Reduction Techniques	1.0
EENG	8768 Advanced Residuals Management	2.0
EENG	8784 Environmental Law 2	1.0
EENG	8785 Decision Making in Environmental Management	2.0

### 3. Graduating Project (12 credits)

All students seeking to graduate from the program must successfully complete the project. The objective of the project is to allow students to apply specialty knowledge in a real-life situation, study or applied research project in conjunction with an industry sponsor. The project assignment should contain some elements which are deemed to be innovative, experimental or exploratory in nature. The student will be responsible for securing an industry sponsor with expertise in the project area.

		credits
EENG	8900 Project Reports	1.0
EENG	8901 Project Proposal	1.0
EENG	8902 Technical Presentations	2.0
EENG	8903 Applied Research Project	8.0

### 4. Liberal Education (12 credits)

Students will be required to achieve these credits in accordance with BCIT Policy on Liberal Education course requirements. Information on subject areas may be obtained from the program head or the Registrar's Office.

### Faculty and Staff

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 Bill Lightowlers, B.Sc., MBA, Beak Consultants  
 Elizabeth McDonald, CIH, ROH, M.Sc., Analytical Service Laboratories Ltd.  
 G.M. Pichler, Association of Professional Engineers and Geoscientists of B.C.  
 B. Shepherd, PEng., Environment Canada  
 Ken Stubbs, B.Sc., MA., QEP (Chair) Greater Vancouver Regional District  
 T.D. Vassos, Ph.D., PEng., NovaTec Consultants Ltd.  
 W. Yang, B.C. Environment  
 R. Zapf-Gilje, Ph.D., PEng., Golder Associates Ltd.

## Construction Trades Programs

### Boilermaking

#### Certificate Program (Full-time)

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 fibreglass 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.

#### Grading

A minimum of 70 per cent grade point average in each of the Total Theory and Practical Projects is required to successfully complete the program.

#### Program Length

Full-time, 23 weeks.

#### Normal Course Hours

0700-1330, Monday through Friday.

#### Tuition Fees 1999/2000 (subject to change)

\$838.45 for the 23-week program.

#### Books and Supplies 1999/2000

\$367 (general estimated cost and subject to change).

#### Entrance Requirements

Successful completion of grade 11. English 11 or acceptable equivalent. Academic Math 11. BCIT pretest is acceptable for English and Math. Departmental interview is required. Contact the Boilermaker instructor, Joe Kiwior at (604) 412-7435, for an appointment. Good physical condition is required for success in the Boilermaking trade, as well as good hearing and no color blindness.

*continued next page*

## Boilermaking cont.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

### Program Content — Boilermaking

Courses	Hours
BMKR 1100 Safe/Acceptable Work Practices	30
BMKR 1101 Mathematics	30
BMKR 1102 Sketch and Read Drawings	60
BMKR 1103 Basic Measuring/Layout/Tools	15
BMKR 1104 Metal Fab Power Equipment	30
BMKR 1105 Patterns/Templates-Shop Applications	15
BMKR 1106 Use Oxyacetylene	60
BMKR 1107 Arc Welding	120
BMKR 1108 Use Fibre Rope	30
BMKR 1109 Use Wire Rope	30
BMKR 1110 Safe Rigging Practices Procedures	60
BMKR 1111 Erect Tanks	90
BMKR 1112 Boiler Construction Processes	60
BMKR 1113 Fabricate/Erect Penstock	30
BMKR 1114 Assemble/Dismantle Refin Comps	30
<b>Total</b>	<b>690</b>

### Instructors

Joe Kiwior  
Richard MacIntosh  
Kevin Neustaedter, Chief Instructor, kneustae@bcit.bc.ca

### Fresh Start

This full-time technical literacy program provides academic upgrading in an applied setting for students wishing to enter a trades/technical program at BCIT.

For information about the Fresh Start program, please refer to page 51 of this calendar.

### Trades Discovery for Women

This full-time program is designed to prepare participants to successfully enter and complete a Trades Training program. For information about the Trades Discovery for Women program, please refer to page 52 of this calendar.

## Carpentry

### Certificate Program (Full-time)

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 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 can 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 the Educational Resource Centre for Students with Disabilities to arrange an interview (telephone interview if out of town) with the Institute's Rehabilitation Specialist, (604) 451-6963.

### Grading

A minimum of 70 per cent grade point average in each of the Total Theory and Practical Projects is required to graduate.

### Program Length

Full-time, 28 weeks, with five to six classes starting each year.



### Normal Course Hours

0730-1415, Monday through Friday.

### Tuition Fees 1999/2000 (subject to change)

\$1014.20 for the 28-week program.

### Books and Supplies 1999/2000

\$665 (general estimated cost and subject to change).

### Entrance Requirement

High school graduation. English 12. Any Math course at the Grade 11 level. BCIT pretest is acceptable for English and Math.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

### Fresh Start

This full-time technical literacy program provides academic upgrading in an applied setting for students wishing to enter a trades/technical program at BCIT.

For information about the Fresh Start program, please refer to page 51 of this calendar.

### Trades Discovery for Women

This full-time program is designed to prepare participants to successfully enter and complete a Trades Training program. For information about the Trades Discovery for Women program, please refer to page 52 of this calendar.

### Program Content — Carpentry

Courses	Hours
CARP 1205 Use Safe Work Practices	7.5
CARP 1300 Describe Carpentry Trade	7.5
CARP 1310 Interpret Drawings and Specs	15.0
CARP 1315 Identify Materials	15.0
CARP 1320 Use Hand Tools	15.0
CARP 1325 Use Portable Power Tools	7.5
CARP 1330 Use Shop Equipment	15.0
CARP 1335 Use Survey Instruments	7.5
CARP 1340 Use Rigging and Hoisting Equip	15.0
CARP 1345 Use Site Layout	7.5
CARP 1350 Build Concrete Formwork	22.5
CARP 1355 Frame Residential Housing	75.0
CARP 1360 Use Special Construction	7.5
CARP 1365 Apply Finishing Materials	22.5
CARP 1370 Describe Insulation and Energy	7.5
CARP 1375 Solve Mathematical Problems	15.0
CARP 1380 Prepare for Employment	7.5
Theory Total	270
CARP 1390 Practical Projects	570

### Instructors

Rick Dohl, B.Ed., T.Q., I.P., Carpentry, rdohl@bcit.bc.ca

John-Allan Eliassen, T.Q., I.P., Carpentry/Joinery I.D.,  
jeliasen@bcit.bc.ca

Luigi Fontana, T.Q., Carpentry I.D.

Poul Jacobsen, T.Q., I.P., Carpentry I.D.

Kal Klasen, T.Q., I.P., Carpentry I.D., DIP. Adult Ed.,  
kklasen@bcit.bc.ca

Bob Maikawa, T.Q., I.P. Carpentry

Poul Nielsen, T.Q., I.P., Carpentry I.D.

Wayne Stevens, T.Q., I.P., Carpentry/Joinery I.D.,  
Registered Housing Professional, wstevens@bcit.bc.ca

Kurt Traugott, B.Ed., T.Q., Carpentry, Chief Instructor,  
ktraugot@bcit.bc.ca

Bill Veerkamp, T.Q., I.P., I.D., bveerkam@bcit.bc.ca



## Drafting

### Certificate Programs (Full-time)

The Drafting program offers four areas of specialization: Civil, Mechanical, Architectural and Structural. Applicants must indicate area of specialization on their application.

Drafting at BCIT offers training for a variety of applications in architecture, building construction, mechanical, industrial and piping applications, civil and 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.

### Grading for All Specialties

A minimum grade of 65 per cent is required to pass each course. All courses must be passed in order to successfully complete the program.

### Program Length

Full-time, 40 weeks, beginning September each year (20 weeks of the drafting core and 20 weeks of the drafting specialty).

### Normal Course Hours

0700-1345, Monday through Friday.

### Tuition Fees 1999/2000 (subject to change)

\$1406 for the 40-week program.

### Books and Supplies 1999/2000

Architectural: \$560  
Civil: \$615  
Mechanical: \$575  
Structural: \$560

*(general estimated cost and subject to change).*

### Entrance Requirements

High school graduation. English 12 or Communications 12. Academic Math 11 or Introduction to Math 11 or Math 11A. BCIT pretest is acceptable for English and Math. Good hand/eye coordination and technical aptitude. All students will enter and complete the Drafting Core. Students will then be channeled into their chosen drafting specialty (Civil, Mechanical, Architectural or Structural Drafting). Applicants must state which drafting specialty they prefer when applying.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

### Fresh Start

This full-time technical literacy program provides academic upgrading in an applied setting for students wishing to enter a trades/technical program at BCIT.

For information about the Fresh Start program, please refer to page 51 of this calendar.

### Trades Discovery for Women

This full-time program is designed to prepare participants to successfully enter and complete a Trades Training program. For information about the Trades Discovery for Women program, please refer to page 52 of this calendar.

## Civil Drafting

The specialty prepares students 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.

### Program Content — Civil Drafting

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

Courses	Hours	Credits
DRFT 1010 Core Drafting	45	3.0
DRFT 1015 Advanced Drafting	75	5.0
DRFT 1101 Building Construction	180	12.0
DRFT 1102 Civil Drafting Specialty	540	36.0
DRFT 1103 Civil Drafting CAD	360	24.0
<b>Total</b>	<b>1200</b>	<b>80.0</b>

*Plant a tree -  
Protect a tree.*



## Mechanical Drafting

The specialty prepares students to combine the understanding of building construction with process piping and manufacturing shop processes.

### Job Opportunities

Employment may be found in engineering and consultant firms and in the drafting departments of manufacturing shops.

### Program Content — Mechanical Drafting

Process piping; machine, production and fabrication shop processes; CAD/CAM.

Courses		Hours	Credits
DRFT 1010	Core Drafting	45	3.0
DRFT 1020	Advanced Drafting 1	315	21.0
DRFT 1116	CAD Level 1	180	12.0
DRFT 1117	Theory 1	60	4.0
DRFT 1118	Advanced Drafting 2	360	24.0
DRFT 1119	CAD Level 2	180	12.0
DRFT 1120	Theory 2	60	4.0
<b>Total</b>		<b>1200</b>	<b>80.0</b>

## 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.

### Program Content — Structural Drafting

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

Courses		Hours	Credits
DRFT 1010	Core Drafting	45	3.0
DRFT 1025	Advanced Drafting	315	21.0
DRFT 1035	Structural Steel/Concrete	360	24.0
DRFT 1116	CAD Level 1	180	12.0
DRFT 1119	CAD Level 2	180	12.0
DRFT 1141	Theory 1	60	4.0
DRFT 1144	Theory 2	60	4.0
<b>Total</b>		<b>1200</b>	<b>80.0</b>

## Architectural Drafting

This specialty applies the basic drafting skills learned in the Drafting 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.

### Program Content — Architectural Drafting

Combines architectural design with the skills required to produce working drawings.

Courses		Hours	Credits
DRFT 1010	Core Drafting	45	3.0
DRFT 1030	Architectural Graphics 1	195	13.0
DRFT 1160	CAD Level 1	120	8.0
DRFT 1162	Codes & Regulations 1	30	2.0
DRFT 1163	Theory & History 1	30	2.0
DRFT 1164	CAD Level 2	240	16
DRFT 1165	Architectural Graphics 2	390	26.0
DRFT 1166	Codes & Regulations 2	75	5.0
DRFT 1167	Theory & History 2	75	5.0
<b>Total</b>		<b>1200</b>	<b>80.0</b>

### Instructors

G. Cullen, B.A., B. Theol, I.D., Chief Instructor,  
gcullen@bcit.bc.ca  
W. Chandler, I.D., wchandle@bcit.bc.ca  
B. Hilliard, I.D., bhiliard@bcit.bc.ca  
R. Kinnell, I.D., rkinnell@bcit.bc.ca

## Drywall Trades

### Certificate Program (Full-time)

### Job Opportunities

Drywall installers and finishers work on a wide variety of residential and commercial construction projects. This includes single family homes, apartments and office towers. Drywall finishes are increasingly being used for decorative purposes such as fireplace surrounds, coving, and elaborate ceiling treatments. Suspended ceilings and renovations are a growing part of this work.

### The Program

Training prepares students to enter either the installation or finishing part of this trade. The program is a combination of theory and the hands-on application of what is learned in class. Graduates from this program will typically apprentice as either Lathers or Drywall Finishers.

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## Drywall Trades cont.

As this is a demanding trade, good physical condition is desirable. Potential students with medical or physical difficulties should contact the Educational Resource Centre of Students with Disabilities to arrange an interview (by telephone if out of town) with the Institute's Rehabilitation Specialist, (604) 451-6963.

### Grading

A minimum grade of 50 per cent is required to pass a course. An overall grade point average of 70 per cent is required to successfully complete the program.

### Program Length

Full-time, 26 weeks.

### Normal Course Hours

0730-1430, Monday through Friday

### Total Tuition Fees 1999/2000

\$943.90 for the 26 week program.

### Books and Supplies 1999/2000

\$250.00 (general estimated cost and subject to change)

### Entrance Requirement

High School graduation including English 12 and any Math course at the Grade 11 level. BCIT pretest is acceptable for English and Math.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies and they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

### Fresh Start

This full-time technical literacy program provides academic upgrading in an applied setting for students wishing to enter a trades/technical program at BCIT.

For information about the Fresh Start program, please refer to page 51 of this calendar.

### Trades Discovery for Women

This full-time program is designed to prepare participants to successfully enter and complete a Trades Training program.

For information about the Trades Discovery for Women program, please refer to page 52 of this calendar.

## Program Content — Drywall Trades

Courses	Hours
DRYW 1100 Safety	30
DRYW 1105 Scaffolding	30
DRYW 1110 Drywall Installation and Materials	40
DRYW 1115 Drywall Tools	30
DRYW 1120 Blueprint Reading and Layout	60
DRYW 1125 Drywall Applications	120
DRYW 1130 Ceiling Systems	120
DRYW 1135 Wall Systems	90
DRYW 1150 Drywall Finishing Tools	30
DRYW 1155 Drywall Finishing Materials	50
DRYW 1160 Drywall Finishing	150
DRYW 1165 Drywall Texturing	30
<b>Total</b>	<b>780</b>

### Instructors

Al Vince, TQ, IP, ID

## Ironworking

### Certificate Program (Full-time)

Structural ironworkers erect 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, welder, 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) 432-8203.

### Grading

A minimum grade of 70 per cent is required to pass each course. All courses must be passed in order to successfully complete the program.

### Program Length

Full-time, 23 weeks.

### Normal Course Hours

0700-1330, Monday through Friday.

### Tuition Fees 1999/2000 (subject to change)

\$838.45 for the 23-week program.

### Books and Supplies 1999/2000

\$277 (general estimated cost and subject to change).

### Entrance Requirements

Successful completion of grade 10. English 10 and Math 10. BCIT pretest is acceptable for English and Math. A department interview is a requirement for this program. Good physical condition is required for success in the Ironworker trade, as well as good hearing and no color blindness.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

### Fresh Start

This full-time technical literacy program provides academic upgrading in an applied setting for students wishing to enter a trades/technical program at BCIT.

For information about the Fresh Start program, please refer to page 51 of this calendar.

### Trades Discovery for Women

This full-time program is designed to prepare participants to successfully enter and complete a Trades Training program. For information about the Trades Discovery for Women program, please refer to page 52 of this calendar.



*Avoid disposable products.*

### Program Content — Ironworking

Courses	Hours
IWKR 1100 Safe/Acceptable Work Practices	30
IWKR 1101 Mathematics	30
IWKR 1102 Sketch and Read Drawings	15
IWKR 1103 Measure Layout and Hand Power Tools	30
IWKR 1106 Use Oxyacetylene	60
IWKR 1107 Arc Welding	120
IWKR 1108 Use Fibre Rope	30
IWKR 1109 Use Wire Rope	30
IWKR 1116 Blueprint Reading	15
IWKR 1120 Rigging and Cranes	30
IWKR 1121 Structural Steel Erection	180
IWKR 1122 Layout	30
IWKR 1123 Reinforcing Steel	90
<b>Total</b>	<b>690</b>

### Instructors

Kevin Neustaedter, Chief Instructor, kneustae@bcit.bc.ca  
Ron Rollins

## Joinery (Cabinetmaker)

### Certificate Program (Full-time)

A joiner works in a wide range of specialties such as cabinetmaking, furniture making, boat interiors, store fixture manufacturing and millwork. The type of work in each of these areas varies. In some shops the joiner will be a specialist such as a machine operator or assembly person. 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. Materials, finishes, and hardware specified in the blueprints must be considered before and during fabrication.

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, many students choose to pursue a formal trades qualification by seeking employment as an apprentice.

### Job Opportunities

Employment opportunities vary with the shop size, location and type of work produced. Shops range from small custom shops to large production shops, with the large shops generally located in areas of denser population. Type of work may include but is not limited to millwork, cabinet-making, furniture manufacturing, door, window and stairbuilding.

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## Joinery (Cabinetmaker) cont.

### Grading

A minimum of 70 per cent grade point average in each of the total theory and total practical is required to graduate.

### Program Length

Full-time, 28 weeks.

### Normal Course Hours

0730-1415, Monday through Friday.

### Tuition Fees 1999/2000 (subject to change)

\$1014.20 for the 28-week program.

### Books and Supplies 1999/2000

\$497 (general estimated cost and subject to change).

### Entrance Requirement

High school graduation. English 12 or Communications 12. Any Math course at the grade 11 level. BCIT pretest is acceptable for English and Math. Good physical condition is desirable. Potential students with medical or physical difficulties should contact the Educational Resource Centre for Students with Disabilities to arrange an interview (telephone interview if out of town) with the Institute's Rehabilitation Specialist at (604) 451-6963.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

### Fresh Start

This full-time technical literacy program provides academic upgrading in an applied setting for students wishing to enter a trades/technical program at BCIT.

For information about the Fresh Start program, please refer to page 51 of this calendar.

### Trades Discovery for Women

This full-time program is designed to prepare participants to successfully enter and complete a Trades Training program. For information about the Trades Discovery for Women program, please refer to page 52 of this calendar.

## Program Content — Joinery

Courses			Hours
JOIN	1200	Use Safe Practices	15.0
JOIN	1205	Solve Mathematical Problems	30.0
JOIN	1210	Apply Layout Techniques	52.5
JOIN	1215	Care and Use of Hand Tools	22.5
JOIN	1220	Identify Woodworking Joints	15.0
JOIN	1225	Describe Portable Power Tools	22.5
JOIN	1230	Use Woodworking Machines	45.0
JOIN	1235	Identify Materials	45.0
JOIN	1240	Use Machining/Assembly Technique	15.0
JOIN	1245	Apply a Finish	7.5
JOIN	1250	Install Millwork	7.5
JOIN	1255	Introduction to Computing	7.5
JOIN	1260	Prepare for Employment	15.0
Theory Total			300.0
JOIN	1270	Create Shop Drawings	120.0
JOIN	1275	Practical Projects	420.0
<b>Practical Total</b>			<b>840.0</b>

### Instructors

Dave Stimson, T.Q., Chief Instructor, dstimson@bcit.bc.ca  
 Mike Bubersky, T.Q.  
 Carl Catt, T.Q., ccatt@bcit.bc.ca  
 Dave Dunn, T.Q., ddunn@bcit.bc.ca  
 Ron Hill, T.Q., rhill@bcit.bc.ca  
 Rob Sawatzky, B.Ed., rsawatzk@bcit.bc.ca  
 Don Shortt, T.Q.

## Painting and Decorating

### Certificate Program (Full-time)

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, and complex 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 the Educational Resource Centre for Students with Disabilities to arrange an interview (by telephone if out of town) with the Institute's Rehabilitation Specialist, (604) 451-6963.

## Grading

A minimum grade of 70 per cent is required to pass a course. An overall grade point average of 70 per cent is required to successfully complete the program.

## Program Length

Full-time, 20 weeks.

## Normal Course Hours

0730-1430, Monday through Friday.

## Tuition Fees 1999/2000 (subject to change)

\$703 for the 20-week program.

## Books and Supplies 1999/2000

\$140 (general estimated cost and subject to change).

## Entrance Requirement

Successful completion of grade 10. English 10 and Math 10. BCIT pretest is acceptable for English and Math.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

## Fresh Start

This full-time technical literacy program provides academic upgrading in an applied setting for students wishing to enter a trades/technical program at BCIT.

For information about the Fresh Start program, please refer to page 51 of this calendar.

## Trades Discovery for Women

This full-time program is designed to prepare participants to successfully enter and complete a Trades Training program. For information about the Trades Discovery for Women program, please refer to page 52 of this calendar.

## Program Content — Painting and Decorating

Courses	Hours
PDEC 1100 Introduction to the Trade	15
PDEC 1105 General Safety	30
PDEC 1110 Basic Tools and Equipment	30
PDEC 1115 Ladders and Scaffolding	45
PDEC 1120 Basic Paint Technology	45
PDEC 1125 Color Mixing	30
PDEC 1130 Surface Prep Interior/Exterior	120
PDEC 1135 Procedures/Applic of Coatings	120
PDEC 1140 Paint Failures	15
PDEC 1145 Conventional Spray Finishing	45
PDEC 1150 Airless Spray Finishing	45
PDEC 1155 Decorative Painting	45
PDEC 1160 Basic Trade Math and Estimating	15
<b>Total</b>	<b>600</b>

## Instructors

David A. Lick, Chief Instructor, dlick@bcit.bc.ca

## Plumbing

### Certificate Program (Full-time)

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.

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## Plumbing cont.

Plumbers must be able to work at heights and in enclosed spaces. Good physical condition is necessary. Potential students with medical or physical difficulties should contact the Educational Resource Centre for Students with Disabilities to arrange an interview (telephone interview if out of town) with the Institute's Rehabilitation Specialist, (604) 451-6963.

### Grading

In order to successfully pass a course a minimum grade of 80 per cent is required.

### Program Length

Full-time, 30 weeks.

### Normal Course Hours

0730-1415, Monday through Friday.

### Tuition Fees 1999/2000 (subject to change)

\$1084.50 for the 30-week program.

### Books and Supplies 1999/2000

\$537 (general estimated cost and subject to change).

### Entrance Requirement

High school graduation. English 12. Any Math course at the grade 11 level. BCIT pretest is acceptable for English and Math.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

### Fresh Start

This full-time technical literacy program provides academic upgrading in an applied setting for students wishing to enter a trades/technical program at BCIT.

For information about the Fresh Start program, please refer to page 51 of this calendar.

### Trades Discovery for Women

This full-time program is designed to prepare participants to successfully enter and complete a Trades Training program. For information about the Trades Discovery for Women program, please refer to page 52 of this calendar.

## Program Content — Plumbing

Courses	Hours
PPGS 1100 Use Safe Work Practices	50
PPGS 1101 Solve Related Math Problems	56
PPGS 1102 Solve Related Science Problems	50
PPGS 1103 Use Piping Hand Tools	50
PPGS 1104 Use Specialized Power Tools	20
PPGS 1105 Use Piping Equipment	56
PPGS 1106 Use Fasteners and Fittings	5
PPGS 1107 Measuring Tools and Hand Tools	5
PPGS 1108 Describe the Piping Trades	5
PPGS 1109 Select Common Piping Materials	32
PPGS 1110 Install Valves Fittings Hanger	50
PPGS 1111 Rigging and Scaffolds	26
PPGS 1112 Use Oxygen Acetylene Equipment	68
PPGS 1113 Read Sketch Basic Drawings	60
PPGS 1114 Construct Piping Systems Proj	70
PPGS 1115 Layout/Design Piping Drawings	20
PPGS 1116 Prepare for Employment	17
PPGS 1117 Select Common Plumbing Mats	20
PPGS 1118 Install Hot Water Heat Systems	68
PPGS 1119 Plumbing Systems	26
PPGS 1120 Install Drainage Waste Vent Sy	74
PPGS 1121 Install Potable Water Systems	44
PPGS 1122 Install Plumbing Fixtures	28
<b>Total</b>	<b>900</b>

### Instructors

David Bowles, Chief Instructor, dbowles@bcit.bc.ca  
 Bill Bradbury, wbradbur@bcit.bc.ca  
 Gary Clifford  
 Keith Colby  
 William Evans  
 Bill Johnston, bjohnsto@bcit.bc.ca  
 Karl Lutsch  
 Ron Marier, rmarier@bcit.bc.ca  
 John Masse, jmasse@bcit.bc.ca  
 Dale Pfaff, dpfaff@bcit.bc.ca  
 Nick Potis  
 Tota Ram  
 Howard Rothenburg  
 Bruce Whiting



## Sheet Metal Working

### Certificate Program (Full-time)

Sheet metal workers fabricate, assemble, alter and install a variety of sheet metal products. Typical jobs performed by a sheet metal worker include air conditioning system ductwork, hospital and kitchen equipment (stainless steel), industrial exhaust systems, industrial sheet metal work, skylight work, roofing and flashing (copper, aluminum, stainless steel and galvanized iron).

### Job Opportunities

Students are prepared for entry-level employment in the sheet metal and precision metal forming industries. Upon successful completion of the program, students may seek employment as apprentices.

With the improvement in the construction industry in B.C., employment opportunities for sheet metal workers improve. New opportunities are opening up in the precision metal forming industry. Graduates are finding employment with both union and non-union employers. Apprenticeships are available. The employment picture in this trade is expected to be positive 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 necessary. Potential students with medical or physical difficulties should contact the Educational Resource Centre for Students with Disabilities to arrange an interview (telephone interview if out of town) with the Institute's Rehabilitation Specialist, (604) 451-6963.

### Grading

A minimum passing grade for each course is 70 per cent. An overall GPA of 70 per cent or better is required to pass the program.

### Program Length

Full-time, 20 weeks.

### Normal Course Hours

0730-1415, Monday through Friday.

### Tuition Fees 1999/2000 (subject to change)

\$733 for the 20-week program.

### Books and Supplies 1999/2000

\$459 (general estimated cost and subject to change).

### Entrance Requirement

High school graduation. English 12. Any Math course at the Grade 11 level. BCIT pretest is acceptable for English and Math.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

### Fresh Start

This full-time technical literacy program provides academic upgrading in an applied setting for students wishing to enter a trades/technical program at BCIT.

For information about the Fresh Start program, please refer to page 51 of this calendar.

### Trades Discovery for Women

This full-time program is designed to prepare participants to successfully enter and complete a Trades Training program. For information about the Trades Discovery for Women program, please refer to page 52 of this calendar.

### Program Content — Sheet Metal Working

Courses	Hours
SMTL 1140 Introduction to Industry	12
SMTL 1141 Safety	36
SMTL 1142 Mathematics	36
SMTL 1143 Materials	30
SMTL 1144 Pattern Development	92
SMTL 1145 Shopwork Theory	96
Shopwork Practical	150
SMTL 1146 Field Installations	18
SMTL 1147 Welding Theory	6
Welding Practical	24
<b>Total</b>	<b>600</b>

### Instructors

Ted Kondo, I.P., Sheet Metal I.D., Chief Instructor,  
tkondo@bcit.bc.ca

Roger Hagan, I.P., Sheet Metal I.D.

Dave Stewart, I.P., Sheet Metal I.D., dstewart@bcit.bc.ca

## Steamfitting

### Certificate Program (Full-time)

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 the Educational Resource Centre for Students with Disabilities to arrange an interview (telephone interview if out of town) with the Institute's Rehabilitation Specialist, (604) 451-6963.

### Grading

In order to successfully pass a course a minimum grade of 80 per cent is required.

### Program Length

Full-time, 30 weeks.

### Normal Course Hours

0730-1415, Monday through Friday.

### Tuition Fees 1999/2000 (subject to change)

\$1084.50 for the 30-week program.

### Books and Supplies 1999/2000

\$486 (general estimated cost and subject to change)

### Entrance Requirement

High school graduation. English 12. Any Math course at the grade 11 level. BCIT pretest is acceptable for English and Math.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

### Fresh Start

This full-time technical literacy program provides academic upgrading in an applied setting for students wishing to enter a trades/technical program at BCIT.

For information about the Fresh Start program, please refer to page 51 of this calendar.

### Trades Discovery for Women

This full-time program is designed to prepare participants to successfully enter and complete a Trades Training program.

For information about the Trades Discovery for Women program, please refer to page 52 of this calendar.

### Program Content — Steamfitting

Courses	Hours
STMG 1100 Use Safe Work Practices	58
STMG 1101 Solve Related Math Problems	58
STMG 1102 Solve Related Science Problems	58
STMG 1103 Use Piping Hand Tools	52
STMG 1104 Use Specialized Power Tools	22
STMG 1105 Use Piping Equipment	58
STMG 1106 Use Fasteners and Fittings	7
STMG 1107 Measuring Tools and Hand Tools	7
STMG 1108 Describe the Piping Trades	7
STMG 1109 Select Common Piping Materials	7
STMG 1110 Install Valves Fittings Hanger	52
STMG 1111 Rigging and Scaffolds	28
STMG 1112 Use Oxygen Acetylene Equipment	70
STMG 1113 Read Sketch Basic Drawings	58
STMG 1114 Construct Piping Systems Project	70
STMG 1115 Layout/Design Piping Drawings	16
STMG 1116 Prepare for Employment	18
STMG 1125 Install a Pump	16
STMG 1126 Install Low Temp Hot Water	82
STMG 1127 Basic Steam Heating System	58
STMG 1128 Install Manufacturing Fitting	34
STMG 1129 Fabricate Fittings	64
<b>Total</b>	<b>900</b>

### Instructors

David Bowles, Chief Instructor, dbowles@bcit.bc.ca  
 Bill Bradbury, wbradbur@bcit.bc.ca  
 Ron Marier, rmarier@bcit.bc.ca  
 Bill Johnston, bjohnsto@bcit.bc.ca

## Steel Fabricating

### Certificate Program (Full-time)

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 the Educational Resource Centre for Students with Disabilities to arrange an interview (telephone interview if out of town) with the Institute's Rehabilitation Specialist, (604) 451-6963.

### Grading

An overall GPA of 70 per cent is required to successfully complete the program.

### Program Length

Full-time, 23 weeks.

### Normal Course Hours

0700-1330, Monday through Friday.

### Tuition Fees 1999/2000 (subject to change)

\$838.45 for the 23-week program.

### Books and Supplies 1999/2000

\$274 (general estimated cost and subject to change).

### Entrance Requirement

Successful completion of grade 10. English 10 and Math 10. BCIT pretest is acceptable for English and Math.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604)434-1610.

### Fresh Start

This full-time technical literacy program provides academic upgrading in an applied setting for students wishing to enter a trades/technical program at BCIT.

For information about the Fresh Start program, please refer to page 51 of this calendar.

### Trades Discovery for Women

This full-time program is designed to prepare participants to successfully enter and complete a Trades Training program. For information about the Trades Discovery for Women program, please refer to page 52 of this calendar.

### Program Content — Steel Fabricating

Courses	Hours
STEL 1200 Apply Saf/Accep Work Practice	30
STEL 1205 Mathematics	65
STEL 1210 Sketch and Read Drawings	65
STEL 1215 Measu Layout Hand/Power Tools	25
STEL 1220 Metal Fabrication Power Equipment	45
STEL 1225 Patterns/Templates-Shop Appl	45
STEL 1230 Use Oxy-acetylene	50
STEL 1235 Arc Welding	55
STEL 1240 Blueprint Reading	65
STEL 1245 Plate Development	60
STEL 1250 Material Handling	20
STEL 1255 Cleaning and Painting	10
STEL 1260 Fabricate Projects	155
<b>Total</b>	<b>690</b>

### Instructors

Gary Blidook, gblidook@bcit.bc.ca  
 Kevin Neustaedter, Chief Instructor, kneustae@bcit.bc.ca  
 Mohinder Soomel  
 Terry Subtelny  
 Peter Thomas

## Welding Provincial Welder

### Certificate Program (Full-time and Part-time)

#### The Programs

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

Each of these qualification levels is followed by a job experience requirement to be completed before certification can be awarded through the Employment Training Branch of the B.C. Ministry of Advanced Education, Training and Technology. Welding programs are available 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.

#### Tuition Fees 1999/2000 (subject to change)

Level C:     \$1054.50 for the 30-week program.  
Level B:     \$562.40 for the program.  
Level A:     \$251.20

#### Books and Supplies 1999/2000

Level C: \$438                      Level B: \$347  
(general estimated cost and subject to change).

## Welding Level C Program

### Certificate Program (Full-time)

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 I (SMAW I)  
P5   Carbon arc gouging (AAC)  
P6   Gas metal arc welding (GMAW I)  
     Flux core arc welding (FCAW I)  
RK1   Material handling  
RK2   Blueprint reading I (Math Supplement)  
RK3   Welding metallurgy I Math

### Program Length

Full-time, 30 weeks.

### Normal Course Hours

0700-1330, 1300-1930, or 1530-2200, Monday - Friday.

### Admissions Process

Individuals interested in this program should complete a full-time application form and submit it to the Admissions department.

### Entrance Requirement

Successful completion of grade 10 is recommended. English 10 and Math 10. BCIT pretest is acceptable for English and Math. An appropriate combination of work experience and education will be considered.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

## Welding Level B Program

### Certificate Program (Full-time)

#### The 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. Registration is done by phone (604) 432-8203, or in person in the Welding Office, Building NE12, second floor at the Burnaby campus.

#### 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.

### Admissions Process

Interested individuals should contact the Welding Department at (604) 432-8203

### Entrance Requirements

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.

## Welding Level A

### Certificate Program (Full-time)

#### The 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. Registration is done by phone (604) 432-8203, or in person in the Welding Office, Building NE12, second floor at the Burnaby campus.

#### 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 eight weeks depending on number of modules required.

### Admissions Process

Interested individuals should contact the Welding department at (604) 432-8203.

### Entrance Requirements

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.

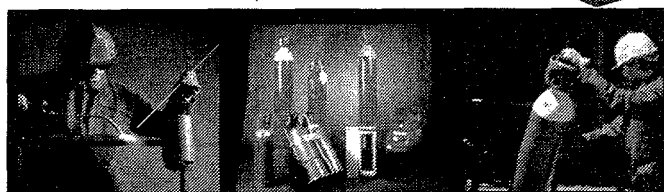
### Fresh Start

This full-time technical literacy program provides academic upgrading in an applied setting for students wishing to enter a trades/technical program at BCIT.


For information about the Fresh Start program, please refer to page 51 of this calendar.

### Trades Discovery for Women

This full-time program is designed to prepare participants to successfully enter and complete a Trades Training program. For information about the Trades Discovery for Women program, please refer to page 52 of this calendar.

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## 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, Self-Paced Programs and Short-term Welding Upgrade (or C, B, A Options)

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. Registration is done by phone (604) 432-8203, or in person in the Welding Office, Building NE12, second floor.

## Welding Applied Processes

Training in the following processes is available by request. All inquiries should be directed to the Welding Office at (604) 432-8203 for course costs and dates.

- Submerged Arc Welding
- Automated welding systems
- GTAW of titanium alloys
- Downhill pipeline

## Part-time Courses

A number of introductory courses in welding are available through the Part-time Studies department. Credit transfer from these courses may be arranged when enrolling in Welding Upgrade Options.

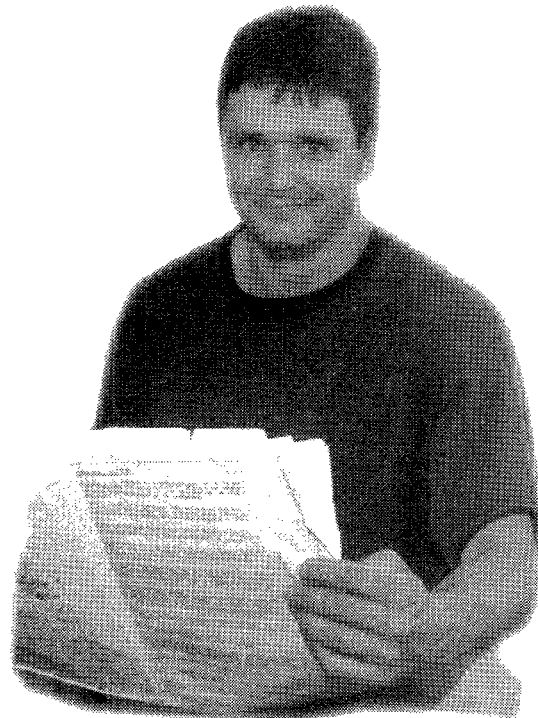
## Instructors

Larry Cox, Chief Instructor (a.m. shift) lcox@bcit.bc.ca  
 Jim Anderson  
 Chris Bishopp  
 Don Becker  
 Brian Finnie  
 Cliff Grass, cgrass@bcit.bc.ca  
 George Jones, Chief Instructor (p.m. shift), gjones@bcit.bc.ca  
 Don McRae  
 Kerry Neilson  
 Eric Sukkel, esukkel@bcit.bc.ca  
 Rod Walters  
 Al Wood

*"BCIT sent me into the field with the skills needed to finish the job on a professional level.*

*Brite Sheet Metal has such high standards of workmanship that BCIT grads and apprentices go hand in hand with the company."*

*~ Bob Whitty, 1994 Sheet Metal Apprentice & Foreman, Brite Sheet Metal*



*They ask for our grads by name*

# Electrical and Electronic Technology



*"BCIT provided me with both a fundamental understanding of the industry and hands-on experience. It allowed me to approach employers with the confidence that I possess a competent level of skill and comprehension to fulfill the requirements of a particular position. With Flow Engineering, I have begun to establish a solid career through a position that matches my experience and education."*

*~ Nathen Chui, 1997,  
Industrial Instrumentation graduate  
& Inside Sales,  
Flow Engineering Inc.*

Electrical and  
Electronic

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Automated Business Equipment Technician	136		

## Introduction

The electrical and electronic industry is one of the fastest growing and most exciting areas of economic development in British Columbia. BCIT has responded to the challenge of rapidly changing technology by forming a separate program area 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 variety of managers, technicians, technologists and engineers from industry.

Electrical and Electronic Technology provides an extensive and coordinated set of training and educational programs specifically designed for job entry and career advancement in the electrical and electronic fields. These programs include electrical entry-level and apprenticeship; electronics technician and related specialties; and the electronics program for engineering technologists.

## Administration

### Office of the Dean

Dennis C. Duffey, Dean  
Holly Stanley, Operations Manager

### Electronic Engineering Technology

Glenn Pellegrin, B.A. Sc., P.Eng., Associate Dean

John Schoonover, Dipl.T, AscT, Automation and Instrumentation Technology

Ron Jones, P.Eng., Computer Control Technology

Ernie Hancock, Dipl.T, B. Eng, P.Eng., Electrical Power Technology

Enrico Murru, B.A.Sc, P.Eng., Telecommunications Technology

### Electrical/Electronic Trades

Dennis C. Duffey, Associate Dean

Advanced Industrial Computing

Automated Business Equipment Technician

Electrical Control Service Technician

Electricity and Industrial Electronics

Electronics Technician Common Core

Industrial Instrumentation Service Technician

Marine Electronics Service Technician

Security Alarm Installer

Telecommunications Technician

Computer Systems Service Technician

## Electrical/Electronic Technology Programs

### Electronic Engineering Technology Two-Year Diploma Program (Full-time) Three-Year Cooperative Diploma Program (Full-time)

#### Common First Year

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

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

**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.

#### Tuition Fees 1999/2000 (subject to change)

\$4676.60 for the two-year program. Additional fee for each Co-op work term of \$419.50.

#### Books and Supplies 1999/2000

Year 1: \$1600; Year 2: \$1570; Co-op: \$419.50 (general estimated cost and subject to change). Ownership of a personal computer is strongly recommended.

#### Degree Transfer/Completion

Bridge programs are available from the Electronic Engineering diploma programs to University of Victoria and Lakehead University engineering programs. Alternatively, transfer credit to UBC and SFU degree programs is available on an individual basis. Graduates of the BCIT program will also meet the prerequisites for the Bachelor of Technology degree program currently under development at BCIT.

#### Accreditation

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



## Entrance Requirements

High school graduation. English 12(C) or better. Refer to "English Language Proficiency" under "Admissions" in the full-time calendar. Math 12(C+). Assessment testing for math is available through Math department. Physics 11(C+) or Physics 12(P). Chemistry 11(C) is desirable for Automation and Instrumentation. ETE (Engineering Technology Entry) program may be acceptable in lieu of entrance requirements. The prerequisites for entry into individual Electronic courses are listed with the course descriptions. For program information session dates contact BCIT Registration and Information at (604) 434-1610.

It is strongly recommended that applicants complete the self-evaluation section available on our WEB site at [www.bcit.bc.ca/~ee/ee\\_techprog.htm](http://www.bcit.bc.ca/~ee/ee_techprog.htm)

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

## Engineering Technology Entry (ETE)

This full-time day school program provides academic upgrading to students wishing to enrol in engineering-based technology programs at BCIT.

For information about the ETE program, please refer to page 51 of this Calendar.

## Technology Entry with English Language Training Program (TEWELT)

This program is offered through Academic Studies and runs concurrently with the ETE January intake. Computer literacy, math and physics lectures are common courses with ETE, but TEWELT has its own extended communication course which focuses on skills needed by students who require English language training. For more information about the TEWELT program please refer to page 52 of this calendar.

## Direct Entry

Applicants with post-secondary academic achievement may apply for advanced standing in the program. Applicants are assessed individually. Applicants should have a solid academic background and good communication skills, be able to apply theory in practical situations and be able to work effectively with people in a team situation. Applicants may be required to write Prior Learning Assessment Recognition Exams (challenge exams) to assess their competence.

## 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 Diploma of Technology. The paid work periods with an employer in the Electronics industry are of three to 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 gives an added advantage in securing a position after graduation. Check our Cooperative Education section for more information.

### Common First-year Courses

Level 1	(17 weeks)	*hrs/wk	credits
COMM 1143	Technical Writing 1 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	4.0	4.5
MATH 1431	Technical Mathematics for Electronics	7.0	8.0
PHYS 1143	Physics for Electronics 1	5.0	5.5

Level 2	(17 weeks)	*hrs/wk	credits
ELEX 2105	Circuit Analysis 2	5.0	5.5
ELEX 2115	Digital Techniques 2	5.0	5.5
ELEX 2120	Electronic Circuits 1	6.0	7.0
ELEX 2125	C Programming	4.0	4.5
MATH 2431	Calculus for Electronics	6.0	7.0
PHYS 2143	Physics for Electronics 2	5.0	5.5

Co-op 1	*hrs/wk
ELEX 2990 Co-op 1	15.0

\* denotes hours of classtime per week.

*"Having completed several instrumentation courses myself, I have first-hand knowledge of BCIT's top quality instructors. I have hired three BCIT employees, all of whom were perfectly suited to my company. I will continue to use BCIT as a very valuable resource."*  
— Michael, Smith, General Manager,  
Flow Engineering Inc.

## Automation and Instrumentation Technology

### Option within Electronic Engineering Diploma Program

As B.C. industries expand into global markets, there is a continuous need to improve product quality, reduce energy consumption, eliminate pollution and make better use of available resources. These changes often require increased investment in automation systems and provide tremendous opportunities to skilled individuals willing to accept a challenge. Automation and instrumentation, the key enabling technology for these improvements, is concerned with the measurement and control of processes, operations and systems. Automation systems range from simple domestic heating and cooling control systems to the sophisticated power management and guidance controls found on the space shuttle.

Our Engineering Technology program provides students with the knowledge and practical skills needed to work in this dynamic field. Students learn how to design, build and use modern measurement, and control systems. Emphasis is placed on developing the ability to analyse, troubleshoot and design the complex computer-based systems needed in sophisticated industrial and commercial systems. Well-equipped labs provide the student with practical, hands-on exposure to industrial equipment. Almost 50 per cent of the instructional hours are spent in the lab where concepts and ideas presented during lectures are reinforced.

### Job Opportunities

Automation and instrumentation offers challenging and fulfilling careers for engineering technologists in design, research and development, technical support and technical sales.

Graduates of this program work in industries such as: consulting engineering; automation equipment sales and support; resource industries such as petrochemical, pulp and paper, wood processing and mining; building automation (HVAC); food processing; materials handling and manufacturing. They are involved in the design, application and support of electronic and computer based automation systems. These specialists use multi-disciplinary skills to interface and network computers and electronic equipment to pneumatic, hydraulic, mechanical and process systems. Companies that have hired graduates of our program include Allen-Bradley, H.A. Simons, Cominco, Pulp and Paper Research Institute of Canada, GE Canada, Norpac Controls, Alberta Wheat Pool, Chevron Canada, Louisiana Pacific, Newnes Automation, and Triumf to name a few. This field offers excellent employment opportunities. Accomplished graduates, with appropriate experience, often move into upper management positions.

### Program Length

The program consists of two 17-week terms (Levels 3 and 4), which are both offered each 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 Electronic Engineering Technology diploma 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. Graduates of the BCIT program will also meet the prerequisites for the Bachelor of Technology degree program currently under development at BCIT.

### Accreditation

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

### Entrance Requirements

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 if seats are available, provided they have the course prerequisites.

### 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. Applicants may be required to write Prior Learning Assessment Recognition (challenge exams) to assess their competence.

### Cooperative Education

Automation and Instrumentation Technology students are encouraged (but are not required) to participate in Cooperative Education. Check our Cooperative Education section for more information.

### 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 wks)	3B (9 wks)	
			hrs	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	5.0	5.0	5.5
ELEX	3215	Process Control Devices/Techniques	6.0	6.0	7.0
ELEX	3305	Microcontroller Systems I	6.0	6.0	7.0
MATH	3431	Transform Calculus Electronics	4.0		2.0

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

			hrs
ELEX	3990	Co-op 2	15.0

#### Level 4

			3A (8 wks)	3B (9 wks)	
			hrs	hrs	credits
COMM	2443	Technical Writing 2 for Electronics	3.0	3.0	3.5
ELEX	4205	Microprocessors for Measurement and Control	6.0	6.0	7.0
ELEX	4210	Analysers 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)	4.0	4.0	4.5

## Computer Control Technology

### Option within Electronic Engineering Diploma Program

A broad based program that provides the necessary background for entry into a variety of areas in the electronics industry. Students will learn how to write software (for a personal computer and microcontroller) and design electronic 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, data 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, Triumph, Prism Systems, VTech Engineering, Alpha Technologies, Honeywell, IBM, Creo Products Inc., 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/Completion

Bridge programs are available from the Electronic Engineering Technology diploma programs to University of Victoria and Lakehead University engineering programs. Alternatively, transfer credit to UBC and SFU degree programs is available on an individual basis. Graduates of the BCIT program will also meet the prerequisites for the Bachelor of Technology degree program currently under development at BCIT.

### Accreditation

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

### Entrance Requirements

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. Applicants may be required to write Prior Learning Assessment Recognition (challenge exam) to assess their competence.

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## Computer Control Technology cont.

### 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. Applicants may be required to write Prior Learning Assessment Recognition (challenge exams) to assess their competence.

### Cooperative Education

Computer Control Technology students are encouraged (but are not required) to participate in Cooperative Education.

### Program Content — Computer Control Technology

#### Second-year courses

##### Level 3

ELEX	3305	Microcontroller Systems 1
ELEX	3310	Pulse Techniques
ELEX	3315	Applications Software
ELEX	3320	Electronic Circuits 2
ELEX	3325	Electrical Equipment
ELEX	3330	Programmable Logic Devices
MATH	3431	Transform Calculus Electronics

3A (8 wks)	3B (9 wks)	
hrs	hrs	credits
6.0	6.0	7.0
4.0	5.0	5.0
5.0	4.0	5.0
6.0	6.0	7.0
5.0	5.0	6.0
	4.0	2.0
4.0		2.0

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

ELEX	3990	Co-op 2
------	------	---------

hrs
15.0

##### Level 4

COMM	2443	Technical Writing 2 for Electronics
ELEX	4315	Applied Electronic Circuits
ELEX	4320	Industrial Electronics and PLCs
ELEX	4325	Microcontroller Systems 2
ELEX	4330	Technical Project (Control)
ELEX	4340	Data Communication
OPMT	1165	Project Management Computer Control

4A (8 wks)	4B (9 wks)	credits
3.0	3.0	3.5
7.0	5.0	7.0
6.0	6.0	7.0
6.0	6.0	7.0
2.0	4.0	6.0
6.0	6.0	7.0
2.0		1.0

### 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), data communications, industrial video applications and programmable logic devices. All stages of product development (design, manufacture, fault finding and testing) are emphasised 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.



## Power Technology

### Option within Electronic Engineering Diploma 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 project manager-estimators with electrical contractors; designer and designer assistants with electrical consultants; high voltage insulation testers with B.C. Hydro; field "engineers" with electrical supply companies; commissioning and troubleshooting or technical sales personnel with electrical manufacturers; commissioning, testing and maintenance personnel with B.C. Transit; construction supervisors with B.C. 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 available from the Electronic Engineering Technology diploma programs to University of Victoria and Lakehead University engineering programs. Alternatively, transfer credit to UBC and SFU degree programs is available on an individual basis. Graduates of the BCIT program will also meet the prerequisites for the Bachelor of Technology degree program currently under development at BCIT.

### Accreditation

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

## Entrance Requirements

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. Applicants may be required to write PLAR exams to assess their competence.

### 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 technical 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 The Canadian Electrical Code, electrical power equipment, industrial electronics and the design of industrial power distribution systems.

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## Power Technology cont.

### Program Content — Power Technology

#### Second-year courses

##### Level 3

ELEX	3305	Microcontroller Systems I
ELEX	3310	Pulse Techniques
ELEX	3315	Applications Software
ELEX	3320	Electronic Circuits 2
ELEX	3325	Electrical Equipment
MATH	3431	Transform Calculus Electronics
ELEX	3330	Programmable Logic Devices

3A (8 wks)	3B (9 wks)	
hrs	hrs	credits
6.0	6.0	7.0
4.0	5.0	5.0
5.0	4.0	5.0
6.0	6.0	7.0
5.0	5.0	6.0
4.0		2.0
	4.0	2.0

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

ELEX	3990	Co-op 2
------	------	---------

hrs  
40

##### Level 4

COMM	2443	Technical Writing 2 for Electronics
ELEX	4320	Industrial Electronics
ELEX	4405	Industrial Systems
ELEX	4410	Power Systems Analysis
ELEX	4415	Electrical Equipment and PLCs
ELEX	4430	Autocad and PLC Projects

4A (8 wks)	4B (9 wks)	
hrs	hrs	credits
3.0	3.0	3.5
6.0	6.0	7.0
7.0	7.0	8.0
6.0	6.0	7.0
6.0	6.0	8.0
2.0	2.0	3.0

## Telecommunications Technology

### Option within Electronic Engineering Diploma 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 from marine, avionic and land mobile radio to digital data transmission networks. Also included in the program are cellular and PCS radio systems, fibre optic links, microwave links, satellite communication systems, local area and wide area networks (LANs and WANs), digital signal processing (DSP), 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 available from the Electronic Engineering Technology diploma programs to University of Victoria and Lakehead University engineering programs. Alternatively, transfer credit to UBC and SFU degree programs is available on an individual basis. Graduates of the BCIT program will also meet the prerequisites for the Bachelor of Technology degree program currently under development at BCIT.

### Accreditation

This technology program is accredited to national standards by the Applied Science Technologists and Technicians of B.C.

### Entrance Requirements

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. Applicants may be required to write PLAR exams to assess their competence.

## Cooperative Education

Telecommunications Technology students are encouraged (but are not required) to participate in Cooperative Education. Check our Cooperative Education section for more information.

## Program Content — Telecommunications Technology

### Second-year courses

			3A (8 wks)	3B (9 wks)	
Level 3			hrs	hrs	credits
ELEX	3305	Microcontroller Systems I	6.0	6.0	7.0
ELEX	3315	Applications Software	5.0	4.0	5.0
ELEX	3520	Electronics Circuits 2 (Telecom)	5.0	5.0	5.5
ELEX	3525	Data Communications	5.0	5.0	5.5
ELEX	3530	Telecommunications I	5.0	5.0	5.5
ELEX	3535	Digital Signal Processing		4.0	2.0
MATH	3431	Transform Calculus Electronics	4.0		2.0

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

			hrs
ELEX	3990	Co-op 2	15.0

			4A (8 wks)	4B (9 wks)	
Level 4			hrs	hrs	credits
COMM	2443	Technical Writing 2 for Electronics	3.0	3.0	3.5
ELEX	4525	RF Circuit Design	5.0	5.0	5.5
ELEX	4530	Telecommunications 2	5.0	5.0	5.5
ELEX	4540	Local Area Networks	6.0	6.0	7.0
ELEX	4545	Transmission Devices	5.0	5.0	5.5
ELEX	4550	Wide Area Networks	5.0	5.0	5.5

## Faculty and Staff

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## 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.

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## Advisory Committee Members Electronic Engineering Technology

S. Atkinson, Division Manager, Customer Service, Rogers Cablesystems (Chairman)  
 D. Buchanan, Manager, B.C. Hydro  
 S. Charlton, Kongsberg Simrad Mesotech Ltd.  
 D. Johnson, Davetek Marketing Inc.  
 E. Davidson, Ministry of Forests  
 K. Martin, Tantalus Systems Corp  
 L. Metcalfe, Dynamic Control Systems  
 J. Nilsson, B.C. Hydro  
 G. Soderling, Glenayre R & D Inc.  
 N. Stenvold, WESCO  
 G. Verrall, Allied Controls  
 C. Wang, B.C. Hydro  
 J. Wiseman, BC TEL

## Advisory Committee Members Automation and Instrumentation

G. Barron, Instrumentation and Communication Services, BC Gas  
 M. Cantor, Manager, Control Systems, Fransen Engineering  
 B. Hindmarch, Ballard Power Systems  
 F. Messmer, Energrated Systems  
 R. Speers, Molson Breweries  
 D. Wall, Vice-President, Norpac Controls Ltd., (Chairman)  
 K. Wall, Instrument Dept. Manager, Hipp Engineering Ltd.  
 H. Welch, Sandwell Inc.

## Electrical Sector Training Programs Advanced Industrial Computing

Depending on demand this program is offered at various times throughout the year. Information and admission is handled by the Electrical/Electronic department area and not the BCIT full-time Admissions office. If you are interested in this program, please call Registration and Information at (604) 434-1610 or contact the program department directly at (604) 432-8728.

## Automated Business Equipment Technician

### One Year Trades Diploma Program (Full-time)

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 micro-processor-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.

### Entrance Requirements

High school graduation. English 12 or Communications 12. Academic Math 11(C). Math 12 recommended. BCIT pretest is acceptable for English only. Also required is graduation from a Provincially approved Electronics Common Core program.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.



For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

This program supports the "Trades Discovery for Women" program, which is designed to prepare women to enter Trades programs. For information about the Trades Discovery for Women program, please refer to page 52 of this calendar.

### Length of Program

Full-time, 40 weeks, beginning in September each year.

### Normal Course Hours

0800-1500, Monday through Friday.

### Tuition Fees 1999/2000 (subject to change)

\$1481 for the 40-week program.

### Books and Supplies 1999/2000

\$675 (general estimated cost and subject to change).

### For Further Information

For more information or to give us your comments, please send an e-mail to [lworley@bcit.bc.ca](mailto:lworley@bcit.bc.ca) or [smccarna@bcit.bc.ca](mailto:smccarna@bcit.bc.ca).

### Program Content —

#### Automated Business Equipment Technician

##### Level 1

- TELX 2226 Customer Relations I
- TELX 2228 Basic Mechanical and Safety
- TELX 2230 Copier Operations
- TELX 2232 Introduction to Microcomputers for Technicians

##### Level 2

- 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

- TELX 4422 Work Experience
- TELX 4424 Analogue Copier Systems
- TELX 4426 Digital Copiers/Printers
- TELX 4428 Color Copiers/Printers
- TELX 4430 Data Communications
- TELX 4432 Microcomputer Repair
- TELX 4434 Career Strategies

### Faculty and Staff

Patrick Muldoon, Chief Instructor, [pmulldoo@bcit.bc.ca](mailto:pmulldoo@bcit.bc.ca)  
 Sherry McCarnan, M.Ed., [smccarna@bcit.bc.ca](mailto:smccarna@bcit.bc.ca)  
 Len Worley, [lworley@bcit.bc.ca](mailto:lworley@bcit.bc.ca)

### Program Advisory Committee

Alex Barber, Minolta Business Equipment  
 Richard Brown, IKON Office Solutions  
 Robert Custus (Co-Chair), Panasonic Canada Inc.  
 Wes Firesen, Danka Canada  
 John Gallagher, Logic Computer Services  
 Greg Heit, IKON Office Solutions  
 Jamie Hennessy, (Co-Chair), IKON Office Solutions  
 Naz Hirji, XEROX  
 Klaus Hoefner, DKP Mail Craft  
 Gordon Horne, Lanier Canada  
 Steve Ilott, IKON Office Solutions  
 Marno Jonasson, Pitney Bowes  
 Cliff Leduc, Danka Canada  
 Fred Nelson, Decision One Canada  
 Lam Nguyen, Citylink Office Systems  
 Stuart Reed, Konica Business Machines  
 Rob Singer, Automation One  
 Gerry Trudeau, Able Copiers  
 Brad Weidenhammer, Rider Computer Services  
 Brian White, IBM Canada

## Electrical Control Service Technician

### One Year Trades Diploma Program (Full-time)

This program will provide 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 impacted by high technology electronic equipment and devices. Challenging career opportunities in the service and maintenance sectors are increasing for electrical workers who have 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.

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## Electrical Control Service Technician cont.

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 the Educational Resource Centre for Students with Disabilities to arrange an interview (telephone interview if out of town) with the Institute's Rehabilitation Specialist, (604) 451-6963.

### Entrance Requirements

High school graduation. English 12 or Communications 12. Academic Math 11(C) Math 12 is recommended. BCIT pretest is acceptable for English only. Also required is graduation from a Provincially approved Electronics Common Core program or Certificate of Qualification with IP seal (journey person) in the trades of Electrician or Industrial Instrument Mechanic plus successful completion of departmental exam on basic electrical/electronic fundamentals.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

This program supports the "Trades Discovery for Women" program, which is designed to prepare women to enter Trades programs. For information about the Trades Discovery for Women program, please refer to page 52 of this calendar.

### Program Length

Full-time, 40 weeks, beginning in January each year.

### Normal Course Hours

0800-1500, Monday to Friday.

### Tuition Fees 1999/2000 (subject to change)

\$1481 for the 40-week program.

### Books and Supplies 1999/2000

\$438 (general estimated cost and subject to change).

## Program Content — Electrical Control Service Technician

### Level 1

TELX	2301	AC, DC and Digital Circuits
TELX	2305	3 Phase and Power Circuits
TELX	2310	AC and DC Applications
TELX	2315	Wiring Methods and Blueprints
TELX	2325	Motor Control Theory and Devices
TELX	2330	Canadian Electrical Code

### Level 2

TELX	3201	Electronic Motor Control
TELX	3205	Computers and PLC I
TELX	3210	Programmable Controls
TELX	3215	Instrumentation and Position Controls
TELX	3220	Optoelectronics and Communications
TELX	3225	Control Applications

### Faculty and Staff

Jim Armstrong, ASCT., Chief Instructor, jarmstro@bcit.bc.ca  
Bill Scudamore

## Electrical Product Distribution

### Certificate Program (Full-time)

This program will provide graduates with the theory and practical skills necessary to enter the field of electrical product distribution. Electrical distributors and manufacturers' representatives provide a vital service to the electrical construction and industrial sectors.

### Job Opportunities

Career opportunities exist in the warehousing, sales, and marketing areas of product distribution. This certificate program is supported by the BC Electrical Association with more than 120 member companies in the Province.

### The Program

The Electrical Product Distribution program emphasizes a practical approach to training, where shop activities and field trips focus on industry practice. The necessary theoretical components are integrated into the program to complement and enhance the development of practical skills.

The program is divided into three levels. A passing grade is required in each course to progress to the next level. A passing grade is required in every course for successful completion of the program. Evaluation is based on both classroom theory and practical projects.

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 the Educational Resource Centre for Students with Disabilities to arrange an interview (telephone interview if out of town) with the Institute's Rehabilitation Specialist, (604) 451-6963.

## Entrance Requirements

High school graduation. English 12 or Communications 12. BCIT pretest in Math (to be tested at approximately the Math 10 level\*). Interview. BCIT pre-test in English is acceptable.

\*Applicants whose transcripts indicate completion of Math 11 or higher are not required to write the BCIT pre-test in Math.

## Program Length

Full-time, 20 weeks, offered at various times.

## Tuition Fees 1999/2000 (subject to change)

\$778 for the 20-week program.

## Books and Supplies 1999/2000

\$360 (general estimated cost and subject to change).

## Program Location

This program is available at the BCIT Burnaby campus.

## Normal Course Hours

0800-1500, Monday through Friday

## Graduation

Minimum passing grade for each course is 70 per cent. In order to move to the next level a student must have successfully passed all courses in the previous level or received permission from the Chief Instructor to move into the next level on a "provisional" basis. Each course must be successfully completed in order to graduate from the program.

## Program Content

### Electrical Product Distribution

Level 1 - Basic Electricity (10 weeks)			Hours	Credits
ELPD	1105	Fundamentals of Electricity	120	8.0
ELPD	1110	Electrical Devices, Tools, and Test Equipment	60	4.0
ELPD	1115	Cable and Equipment	60	4.0
ELPD	1120	Print Reading and Electrical Code	60	4.0
<b>Total Level 1</b>			<b>300</b>	<b>20</b>

Level 2 - Warehousing (4 weeks)			Hours	Credits
ELPD	1205	Principles of Material Handling	60	4.0
ELPD	1210	Warehouse Operations	60	4.0
<b>Total Level 2</b>			<b>120</b>	<b>8.0</b>

Level 3 - Sales and Marketing			Hours	Credits
ELPD	1305	Principles of Marketing	90	6.0
ELPD	1310	Dynamics of Selling	90	6.0
<b>Total Level 3</b>			<b>180</b>	<b>12.0</b>
<b>Program Total</b>			<b>600 hr</b>	<b>40.0</b>

For information on BCIT programs, please contact Registration and Information, (604) 434-1610.

For Information Sessions held throughout the year, contact Registration and Information at (604) 434-1610.

## Electricity and Industrial Electronics

### Certificate Program (Full-time)

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 the Educational Resource Centre for Students with Disabilities to arrange an interview (telephone interview if out of town) with the Institute's Rehabilitation Specialist, (604) 451-6963.

### Program Length

Full-time, 40 weeks, beginning several times a year.

### Tuition Fees 1999/2000 (subject to change)

\$1511 for the 40-week program.

### Books and Supplies 1999/2000

\$516 (general estimated cost and subject to change).

*continued next page*

## Electricity and Industrial Electronics cont.

### Program Locations

This program is available at the BCIT Burnaby and Sea Island campuses and is also offered in Surrey, Langley, and Maple Ridge. Applicants must specify location preference when applying.

### Normal Course Hours

0800-1500, Monday through Friday.

### Entrance Requirements

High school graduation. English 12 or Communications 12. Academic Math 11 (C). BCIT pretest is acceptable for English and Math.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

This program supports the "Fresh Start program". This full-time technical literacy program provides academic upgrading in an applied setting for students wishing to enter a trades/technical program at BCIT. For information about the Fresh Start program, please refer to page 51 of this calendar.

This program supports the "Trades Discovery for Women" program, which is designed to prepare women to enter Trades programs. For information about the Trades Discovery for Women program, please refer to page 52 of this calendar.

### Program Content — Electricity and Industrial Electronics

Level 1	Hours
TELX 1120 Electrical Math	90
TELX 1121 Trade Science	90
TELX 1122 Fundamentals of Electricity	120
TELX 1123 Wiring Methods	150
TELX 1124 Blueprints, Plans and Specifications	60
TELX 1125 Canadian Electrical Code	90
<b>Total Level 1</b>	<b>600</b>
<b>Level 2</b>	
TELX 2220 Principles and Applications of Magnetism	60
TELX 2221 AC Circuit Analysis	180
TELX 2222 AC Applications	90
TELX 2223 Motor Control and Industrial Wiring	90
TELX 2224 Electronics	120
TELX 2225 Computer Skills and Job Preparation	60
<b>Total Level 2</b>	<b>600</b>

### Faculty and Staff

Mike Wanstall, PEng., Chief Instructor, mwanstal@bcit.bc.ca  
 Henry Braun  
 Gordon Denham  
 Joe Jordan  
 Warren Laine  
 Alan Miles  
 Chester Spink  
 Dag Stenerud  
 Steve Wallis

### Advisory Committee Members

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 Carl Foley, ITAC  
 Tracey Gallant, B.C. Electrical Association  
 Daniel Goy, Telecommunications Workers Union  
 Rod Goy, IBEW 213, ECA of B.C. Joint Training Committee  
 Doug Hutton, Bridge Electric  
 George Ingham, United Power Ltd.  
 Bob Leese, Vancouver Industrial Electric Ltd.  
 Reg McGratten, B.C. Hydro-EmploymentCentre  
 Brian McHugh, Electrical Safety-Municipal Affairs  
 Dan Mott, Mott Electric  
 Ian Nichol, B.C. Maritime Association  
 Patrick O'Connell, Western Joint Electrical Training Society  
 Larry Orwier, Dura-Lite Electric Ltd.  
 Clifford Pilkey (Chair), Electrical Contractors Assoc. of B.C.  
 Rick Porcina, Electrical Safety Municipal Affairs  
 Nes Romaniuk, Elworthy Electrical Services  
 Jim Ryan, BC TEL  
 Bill Strain, Villa Electric (1980) Ltd.  
 Mark White, Pacific Protective Systems Ltd.

## Electronics Technician Common Core

### Certificate Program (Full-time)

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.

## Electronics Technician Common Core cont.

### Program Length

Two versions of the program are offered:

Full-time, 30 weeks consisting of two 15-week terms beginning several times a year; and on a part-time evening basis, three nights a week, 3.5 hours per night over two years.

### Normal Course Hours

#### Full-time format:

0800-1500, Monday through Friday

1130-1830, Monday through Friday

#### Part-time format:

1830-2200, Tuesday, Wednesday, Thursday

### Tuition Fees 1999/2000 (subject to change)

\$1129.50 for the full-time day program.

\$685.25 per year for the part-time evening program.

### Books and Supplies 1999/2000

Full-time: \$641      Part-time: \$321

(general estimated cost and subject to change).

### Program Locations

BCIT Burnaby, Sea Island, Langley, Maple Ridge, and Pacific Marine Training Campus.

### Entrance Requirements

High school graduation. English 12 or Communications 12. Academic Math 11(C). Math 12 recommended. BCIT pretest is acceptable for English only.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

This program supports the "Trades Discovery for Women" program, which is designed to prepare women to enter Trades programs. For information about the Trades Discovery for Women program, please refer to page 52 of this calendar.

### 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)
- Automated Business Equipment Technician
- Electrical Control Service Technician
- Industrial Instrumentation Service Technician
- Marine Electronics Service Technician
- Telecommunications Technician

For additional information see your high school counsellor, Technical Education teacher, or call BCIT Registration and Information at (604) 434-1610, or for inquiries from outside the Greater Vancouver Area call us toll-free at 1-800-667-0676, or send an e-mail to [services@bcit.bc.ca](mailto:services@bcit.bc.ca).

### Program Content

#### Electronics Technician Common Core

##### Level 1

- TELX 1101 Electronics Technical Skills 1
- TELX 1102 DC Circuit Analysis
- TELX 1103 AC Circuit Analysis
- TELX 1104 Electronics Troubleshooting 1

##### Level 2

- TELX 1207 Solid State Devices - Discrete
- TELX 1209 Solid State Devices - Integrated
- TELX 1211 Electronics Troubleshooting 2
- TELX 1213 Electronics Technical Skills 2

##### Level 3

- TELX 1309 Digital Principles
- TELX 1311 Microprocessor Principles
- TELX 1313 Electronics Troubleshooting 3

The student must maintain a minimum 70 per cent 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.

### Instructors

Emile Gaudet, Chief Instructor, [egaudet@bcit.bc.ca](mailto:egaudet@bcit.bc.ca)  
Miro Angeles, PEng., M. Ed., [mangeles@bcit.bc.ca](mailto:mangeles@bcit.bc.ca)  
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Dave Hogg  
Lance McCollum  
Jim Penty  
Patricia Stacey  
Bruce Van Groenigen  
Tom Whitehouse  
Canede Wong  
Gabriel Yam, [gyam@bcit.bc.ca](mailto:gyam@bcit.bc.ca)

## Industrial Instrumentation Service Technician

### One Year Trades Diploma Program (Full-time)

**(This program is presently under review and  
may be cancelled in the near future)**

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. Graduates may also qualify for advanced standing as indentured candidates with the Industrial Instrumentation Apprenticeship program.

### 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.

### Entrance Requirements

High school graduation. English 12 or Communications 12. Academic Math 11(C). Math 12 is recommended. BCIT pretest is acceptable for English only. Also required is graduation from a Provincially approved Electronics Common Core program or Certificate of Qualification with IP seal (journey person) in the trades of Electrician or Industrial Instrument Mechanic plus successful completion of departmental exam on basic electrical/electronic fundamentals.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

This program supports the "Trades Discovery for Women" program, which is designed to prepare women to enter Trades programs. For information about the Trades Discovery for Women program, please refer to page 52 of this calendar.

### Length of Program

Full-time, 40 weeks - two 20-week terms with a two-week break at midterm, beginning in January of each year.

### Normal Course Hours

0800-1500, Monday to Friday.

### Tuition Fees 1999/2000 (subject to change)

\$1481 for the 40-week program.

### Books and Supplies 1999/2000

\$244 (general estimated cost and subject to change).

### Program Content — Industrial Instrumentation Service Technician

#### Level 1

TELX	2101	Process Measurement
TELX	2105	Instrumentation Tools
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

### Instructors

J. Armstrong, ASCT., Chief Instructor, jarmstro@bcit.bc.ca  
R. Wagner, rwagner@bcit.bc.ca

## Marine Electronics Service Technician

### Diploma Program (Full-time)

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 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 Length

Full-time, 40 weeks, beginning in January each year.

### Normal Course Hours

0800-1500, Monday through Friday. Course will be held at the Burnaby (BBY) and Pacific Marine Training campuses (PMTC).

Week 1 - 12 at BBY

Week 13 - 20 at PMTC

Week 21 - 30 at BBY

Week 31 - 40 at PMTC

### Tuition Fees 1999/2000 (subject to change)

\$1481 for the 40-week program.

### Books and Supplies 1999/2000

\$1130 (general estimated cost and subject to change).

### Entrance Requirements

High school graduation English 12 or Communications 12. Academic Math 11(C). Math 12 is recommended. BCIT pretest is acceptable for English only. Also required is graduation from a Provincially approved Electronics Common Core program.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

This program supports the "Trades Discovery for Women" program, which is designed to prepare women to enter Trades programs. For information about the Trades Discovery for Women program, please refer to page 52 of this calendar.

### Program Content — Marine Electronics Service Technician

#### 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 per cent overall average in the theory portion and a minimum 70 per cent overall average in the laboratory portion of each level in order to proceed to the next level.

### Instructors

Terry Knudson, B.Ed., Dip.T., T.Q., Chief Instructor,  
tknudson@bcit.bc.ca  
K.C. Yam

## Security Alarm Installer

### Certificate Program (Full-time)

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.

*continued next page*

## Security Alarm Installer cont.

Graduates will be able to:

- design, install, and service alarm systems, central station monitoring equipment, access control systems and closed-circuit television systems.
- apply professional standards to produce high-quality work.
- use safe operating procedures in the workplace.
- produce clear, concise and complete documentation.
- apply effective problem-solving and decision-making skills.
- appreciate the need to maintain expertise through continued education.

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 program is divided into two levels. A passing grade of 65 per cent 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 the Educational Resource Centre for Students with Disabilities to arrange an interview (telephone interview if out of town) with the Institute's Rehabilitation Specialist, (604) 451-6963.

### Entrance Requirements

High school graduation. English 12 or Communications 12. Academic Math 11(C). BCIT pretest is acceptable for English and Math. Prior to admission to the program, applicants will be required to initiate a Criminal Record Search. Appropriate forms and details on how to initiate a Criminal Record Search will be mailed to applicants at the time when their offer of acceptance to the program is being made. Please be aware that the outcome of the Criminal Record Search may influence final acceptance into the program and/or eligibility for licensing upon completion of the BCIT Security Alarm Installer program.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

This program supports the "Trades Discovery for Women" program, which is designed to prepare women to enter Trades programs. For information about the Trades Discovery for Women program, please refer to page 52 of this calendar.

### Program Length

Full-time, 20 weeks, beginning in February and September each year.

### Normal Course Hours

0800-1500, Monday through Friday.

### Tuition Fees 1999/2000 (subject to change)

\$778 for the 20-week program.

### Books and Supplies 1999/2000

\$570 (general estimated cost and subject to change).

### Program Content — Security Alarm Installer

Level 1		Hours
TELC	1100 Fundamentals of Electricity	90
TELC	1101 Fundamentals of Electronics	60
Level 2		Hours
TELC	2200 Building Construction and Codes	60
TELC	2201 Cable and Device Installation	60
TELC	2202 Detection Circuits and Devices	60
Level 3		Hours
TELC	3300 Alarm Control Panels	90
TELC	3301 Central Station Communication	90
TELC	3302 Advanced Security Systems	90

### Faculty and Staff

Mike Wanstall, P.Eng., Chief Instructor, mwanstal@bcit.bc.ca  
 Peter Burleigh, pburleig@bcit.bc.ca  
 Mike Zecchel, mzecchel@bcit.bc.ca

### Advisory Committee Members

Fabian Biagi, Intercon Security  
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 Kelly Breaks, Valley Alarms  
 Wing Chang, BC TEL  
 Delaine DeClark, BCIT - Canada Employment Centre  
 John Finlay, Electrical Contractors Association of B.C.  
 Carl Foley, ITAC  
 Peter Hodgson, Orion Security Systems  
 Michael McCarvill, Kaban Enterprises Ltd.  
 Brian McHugh, Electrical Safety - Municipal Affairs  
 Peter Moore, Moore Security Ltd.  
 Mike Morden, Nova Security Corporation  
 Tim Neill, Atlas Alarms, Ltd.  
 Patrick O'Connell, Western Joint Electrical Training Society  
 Clifford Pilkey, Electrical Contractors Association of B.C.  
 Robert Pitman, Kastle Alarms  
 Mark White (Chair), Pacific Protective Systems Ltd.



## Telecommunications Technician

### Diploma Program (Full-time)

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 Length

Full-time, 40 weeks, beginning in January and September each year.

### Normal Course Hours

0800-1500, Monday through Friday.

### Tuition Fees 1999/2000 (subject to change)

\$1481 for the 40-week program.

### Books and Supplies 1999/2000

\$627 (general estimated cost and subject to change).

### Entrance Requirements

High school graduation. English 12 or Communications 12. Academic Math 11(C). Math 12 is recommended. BCIT pretest is acceptable for English only. Also required is graduation from a Provincially approved Electronics Common Core program.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

## Program Content — Telecommunications Technician

Level 1 (11 weeks)	Hours
TELX 2211 Principles of Telephony	30
TELX 2213 RF Communications	180
TELX 2216 RF Transmission Systems	90
TELX 2217 Multiplex Systems I	30
Level 2 (9 weeks)	
TELX 3311 Fibre Optics	60
TELX 3313 High Reliability Soldering	30
TELX 3315 Voice Cabling	60
TELX 3317 Computer Operating Systems	60
TELX 3319 Data Cabling	60
Level 3 (20 weeks)	
TELX 4411 Telephone Communications	150
TELX 4413 Data Communications	210
TELX 4415 Customer Relations	30
TELX 4417 Digital Networks	30
TELX 4423 Multiplex Systems 2	60
TELX 4425 Industrial Interfacing	120

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 per cent overall average in the theory portion and a minimum of 70 per cent overall average in the laboratory portion of each level in order to proceed to the next level.

### Faculty and Staff

Terry Knudson, B.Ed., Dip. T., T.Q., Chief Instructor,  
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Kevin da Silva, Lucent Technologies Canada

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Janice Sigfusson (Chair), NEC

Beverly Strench, Logical Solutions Ltd.

Steve Cowel, C-Tron Systems

Ted Serne, BC TEL

Jack Wickham, Cablecom Int

Stephen Winkle, NEC

Jim Watson, NEC

Maureen Gaynor, Gaynor Telesystems

## Computer Systems Service Technician

### Certificate Program (Full-time)

This program will provide graduates with the technical and practical skills necessary to obtain entry-level positions in the expanding area of PC computer information technology. Computer Systems Service Technicians customize, install, troubleshoot and maintain the various components of information systems and computer networks, including needs analysis, as well as software and hardware requirements.

### Job Opportunities

Career opportunities exist in every sector of business that processes, installs, configures, and troubleshoots both PC hardware and software components as part of its entrepreneurial activities and/or day-to-day operations.

### The Program

The Computer Systems Service Technician program emphasizes a hands-on, technical approach to training, where experience gained in labs and classrooms can be applied directly to business and industry.

Students will learn the fundamentals of IBM PC microcomputer technology. Computer networking, system maintenance, software installation and customization, and computer programming are areas of emphasis.

Applicants should possess excellent communication and presentation skills along with the capability for analytical and logical thought.

### Entrance Requirements

High school graduation. English 12(C). Math 12(C). Physics 11 is recommended. Applicants must also be interviewed by the department. BCIT pretest is acceptable for English and Math.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

This program supports the "Trades Discovery for Women" program, which is designed to prepare women to enter Trades programs. For information about the Trades Discovery for Women program, please refer to page 52 of this calendar.

### Program Length

Full-time, 40 weeks, beginning in September each year.

### Normal Course Hours

0800-1500, Monday to Friday.

### Tuition Fees 1999/2000 (subject to change)

\$1511 for the 40-week program.

### Books and Supplies 1999/2000

\$600 (general estimated cost and subject to change).

### Program Location

Burnaby Campus.

### Program Content — Computer Systems Service Technician

Courses	Description
CWAS 1100	Computer Skills
CWAS 1102	Basic Electronics
CWAS 1105	Applied Logic and Critical Analysis
CWAS 1110	Applied Computer Science
CWAS 1115	Microcomputer Architecture
CWAS 1120	Operating Systems
CWAS 1125	Computer Networking and Communications
CWAS 1130	Database Design and Administration
CWAS 1135	Software Customization
CWAS 1140	Programming in the MS Windows Environment
CWAS 1145	Visual Basic Programming
CWAS 1160	Student Projects

A passing grade of 70 per cent is required in each course.

All courses must be passed in order to successfully complete the program.

### Faculty and Staff

Patrick Muldoon, Chief Instructor; pmulldoo@bcit.bc.ca  
Chi Wong, cwong@bcit.bc.ca

*"Mott Electric and Communications Ltd. can attribute much of its success to the quality of graduates we have been fortunate to hire from BCIT. As Mott Electric and Communications Ltd. moves towards it's 70th year, we look to BCIT to share in both our company's and employees' futures."*  
— Dan Mott, President,  
Mott Electric and Communications Ltd.

# Health Sciences



*“We have a large ultrasound department and the majority of our staff are graduates from the BCIT medical sonography program. All BCIT graduates have had exposure to high quality ultrasound practice in their clinical rotations — they are familiar with our expectations as most have been students here. Graduates write an American registration; it is well known throughout North America that BCIT grads excel at these exams. Ultrasound is a small community and being known in that community gives BCIT grads a confident leg up.”*

*~ Sue Jamison, Chief Sonographer  
B.C. Woman's Hospital*

Health Sciences

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## Administration

### Office of the Dean

George Eisler, M.A.Sc., M.B.A., P.Eng., Dean,  
geisler@bcit.bc.ca  
Andrea Labe, Administrative Assistant, alabe@bcit.bc.ca  
Patti Mark, B.A., Operations Manager, pmark@bcit.bc.ca

### Program responsibilities:

Cardiology Technology  
Cardiovascular Technology  
Electroneurophysiology Technology

### Diagnostic Technologies

Verna Magee Shepherd, M.Sc., CHE, Associate Dean,  
vmageesh@bcit.bc.ca  
Maryanna Nowak, Assistant to Associate Dean,  
mnowak@bcit.bc.ca

### Program responsibilities:

Adult Echocardiography  
Basic Health Sciences  
Cytogenetics Laboratory Technology  
Diagnostic Medical Sonography  
Environmental Health (Public Health Inspector Training)  
Medical Laboratory Technology  
Medical Radiography Technology  
Nuclear Medicine Technology  
Occupational Health and Safety

### Nursing and Health Engineering

M. Bernadet Ratsoy, B.Sc.N., M.Sc., R.N., Associate Dean,  
bratsoy@bcit.bc.ca  
Cathie Aspden, Assistant to Associate Dean,  
caspden@bcit.bc.ca

### Program responsibilities:

Biomedical Engineering Technology  
Nursing  
Prosthetics and Orthotics

### Basic Health Sciences

This department provides courses in human anatomy and physiology, immunology, microbiology, pathophysiology and applied behavioral sciences for students enrolled in Health Sciences. These courses are designated by the prefix BHSC and are listed in the following Health Sciences programs. Each course is oriented toward a particular technology so the student quickly becomes aware of applications. In many cases these courses are the foundation upon which specific technology subjects are built. The department's responsibility, therefore, is to teach those concepts of biological and behavioral sciences that 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  
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## Biomedical Engineering Technology

### Two-Year Diploma Program (Full-time)

#### Program Objective

This program prepares individuals who are interested in technology and life sciences to enter a challenging career in biomedical engineering.

The program graduates biomedical engineering technologists with the ability to ensure safe and correct performance of equipment used in medicine and biology. The curriculum covers fundamental principles and operations of medical equipment such as physiological monitors, defibrillators, electrosurgical units, clinical laboratory instrumentation, medical imaging and other diagnostic and therapeutic devices. Equipment-related standards, performance assurance testing procedures and trouble shooting techniques are included in this two-year program.

#### Job Opportunities

Graduates of the Biomedical Engineering Technology program may be employed in hospitals, clinics, research laboratories and medical equipment sales and service organizations.

Biomedical Engineering Technologists may be responsible for scheduled and corrective maintenance and safety inspection of medical equipment, 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.

Graduates work closely with biomedical engineers, physicians, and others who use, manage, maintain, design, manufacture and supply scientific and medical equipment. During the second year, each student spends five weeks in supervised training in a local hospital, research agency or equipment supply company.

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.

### Tuition Fees 1999/2000 (subject to change)

\$4676.60 for the two-year program.

### Books and Supplies 1999/2000

First year: \$1045; Second year: \$1096 (general estimated cost and subject to change).

### Entrance Requirements

- High school graduation. English 12. Math 12 (C+ or better). Physics 11 (C+ or better). Chemistry 11 (C+ or better). Prerequisites must be current within the last five years.
- Selection interview with program instructors.
- 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.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

### Re-admission Requirements

Where a student fails a term in the Biomedical Engineering program, and where that failure requires the student to leave the program, the following conditions will apply for re-admission:

- The student must apply for re-admission with application to the Admissions department. An additional application fee must be paid.
- Courses previously taken at BCIT do not automatically qualify for course credit. BCIT reserves the right to require the applicant to re-take any course within the program. This may include courses that have already been successfully completed, and/or courses where transfer credit may have been previously granted.
- Re-admission is conditional upon space availability. Where more applicants apply than there are seats available, BCIT reserves the right to select those applicants deemed to have the best chance for success in their chosen program.

### 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.

### Engineering Technology Entry (ETE)

This full-time day school program provides academic upgrading to students wishing to enrol in engineering-based technology programs at BCIT.

For information about the ETE program, please refer to page 51 of this calendar.

### Technology Entry with English Language Training Program (TEWELT)

This program is offered through Academic Studies and runs concurrently with the ETE January intake. Computer literacy, math and physics lectures are common courses with ETE, but TEWELT has its own extended communication course which focuses on skills needed by students who require English language training. For more information about the TEWELT program please refer to page 52 of this calendar.

### Program Content — Biomedical Engineering Technology

Level I	(15 weeks)	hrs/wk	credits
BHSC 1101	Anatomy and Physiology I	4.0	4.0
BMET 1100	Electronics Principles and Practice I	9.0	9.0
COMM 1178	Technical Writing I for BMET	3.0	3.0
MATH 1151	Computer Skills and Applications	2.0	2.0
MATH 1781	Technical Mathematics for Biomedical Engineering Technology	8.0	8.0
PHYS 1178	Physics for Biomedical Engineering	4.0	4.0

*continued next page*

## Biomedical Engineering Technology cont.

Level 2	(20 weeks)	hrs/wk	credits
BHSC 2201	Anatomy and Physiology 2	3.0	4.0
BMET 2200	Electronics Principles and Practice 2	7.0	9.5
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	16.0	6.0
BMET 3302	Quality Assurance and Systems	5.0	5.0
CHEM 2305	Biochemistry/Instrumental Analysis	6.0	6.0
COMP 3151	Software Engineering	5.0	5.0
Level 4 (15 weeks plus practicum)		hrs/wk	credits
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	2.0	2.0

Most courses taken within the program require successful completion of certain prerequisites. For further information contact BCIT Registration and Information at (604) 434-1610.

### Faculty and Staff

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## Cytogenetics Laboratory Technology

### Post-diploma Program

This program has been postponed in order to develop and then offer a molecular genetics certificate for technologist upgrading. For information regarding the 1999/2000 courses and admission to this program, please contact Fred Bauder, program head at (604) 432-8296.

### Faculty and Staff

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Nazanin Mehin, B.Sc., R.T.(Cg), Assistant Instructor  
(Leave of Absence)

### Clinical Instructors

B.C. Cancer Agency,  
H. Gosling, M.Sc., R.T.(Cg), Cytogenetics Laboratory  
B.C. Children's Hospital,  
W. Duey, B.Sc., R.T.(Cg), Cytogenetic Embryopath,  
Laboratory/Cellular Pathology  
Royal Columbian Hospital  
Bhushan Verma, M.Sc., R.T.(Cg)  
Vancouver Hospital and Health Sciences Centre,  
C. Haessig, B.Sc., R.T.(Cg), Cytogenetics Laboratory  
Chair, Clinical Instructors Liaison Committee  
Clinical Sites/Cytogenetics Laboratory Program, 1996/97

## Diagnostic Medical Sonography

### One Year Post-diploma Program (Full-time)

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 ultra-sound 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 be able to:

- obtain diagnostic images
- correlate clinical and diagnostic findings

## Diagnostic Medical Sonography cont.

- work efficiently in an often stressful environment
- demonstrate excellent interpersonal skills
- communicate well verbally and in writing
- visualize anatomy in three dimensions
- provide high quality patient care
- physically assist in moving patients and equipment
- maintain a high level of physical fitness, especially in the areas of the upper body and back strength.

### 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 emphasised.

Students may elect to learn echocardiography upon completion of the general program.

Graduates of this program are eligible to write the American Registry of Diagnostic Medical Sonography examinations upon completion.

### Tuition Fees 1999/2000 (subject to change)

\$2338.30 for the one-year program.

### Books and Supplies 1999/2000

\$1635 (general estimated cost and subject to change).

### Entrance Requirements

English 12 with a B or better. Diploma of Technology in a minimum two 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.

### Selection

#### *Selection Objectives:*

The Diagnostic Medical Sonography program is committed to a selection model that attracts qualified applicants, selects qualified students who are capable of program and employment success, makes the criteria explicit, and makes selection decisions in a manner that is fair for applicants while meeting the needs of the program and the profession.

#### *Selection Criteria:*

Applicants who meet the prerequisites (entrance requirements) will be assessed against the following selection criteria.

#### **1. Patient care experience**

Sonography students are required to possess patient care skills consistent with those performed by health care technologists in an acute care setting. These skills must be present upon program entry, as they are not taught in the program and are required from the first week of the program. Specific patient care skills include communication, patient transfer, basic catheter and intravenous care, bedpan and urinal use, sterile technique, oxygen set up, patient safety, and respect for patient diversity and confidentiality. The most competitive applicants will have recent (within 3 years) patient care experience as described above. Other patient care experiences will be considered.

#### *Documentation Required:*

One-page typed essay, outlining patient care experience. The essay will be assessed for content, completeness, conciseness, clarity, grammar, and spelling.

The essay must include:

- the dates and length of the experience
- the patient care environment (e.g. acute care, extended care, outpatient)
- Specific tasks performed (refer to selection criteria for tasks performed by allied health technologists)
- Names, addresses, and phone numbers of two supervisors. The program will contact these referees for short-listed applicants.
- Signed consent to contact supervisors for references (to be obtained from admissions upon receipt of application).

#### **2. Knowledge of sonography as practiced in B.C.**

Students who clearly understand the roles and responsibilities of sonographers prior to admission are quickly integrated into the training site. Advance preparation for the clinical practicum reduces the amount of time required by busy clinical sites and the DMS program in professional orientation for the student.

Knowledge of sonography is an awareness of the roles and responsibilities of sonographers; their relationship with patients, reporting physicians, and other members of the health care team; and the physical requirements of the profession. Investigation must take place in Canada, as sonography is practiced differently in other countries.

#### *Documentation Required:*

Completed answers to clinical site questionnaire (to be obtained from admissions upon receipt of application).

#### **3. Participation in relevant continuing education**

Applicants must demonstrate a commitment to life-long learning through continuing education.

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## Diagnostic Medical Sonography cont.

Examples of acceptable continuing education includes, but is not limited to:

*Relevant coursework, such as:*

- Cross sectional anatomy (BCIT or CAMRT). Knowledge of cross sectional anatomical relationships is necessary for students to visualize organs in three dimensions during clinical practicums.
- Advanced topics in patient care (BCIT)
- Pathology (BCIT or CAMRT)
- Introduction to ultrasound (Burwin Institute)
- Participation at relevant allied health, nursing or medical professional meetings

*Self study*

The most competitive applicants will have undertaken relevant coursework within the past three years.

*Documentation Required:*

Professional profile outlining continuing education activities. It must include:

- Types of activities (e.g. graded coursework, seminar, self study)
- Dates and lengths of activities
- Transcripts of graded courses
- List of seminar/self study topics, including brief (maximum one paragraph per event) summaries of material learned

### 4. Post-secondary performance

Present academic performance is positively correlated with previous academic performance. Previous post-secondary grades offer an external assessment of applicant ability.

*Documentation Required:*

Official post-secondary transcripts to include graduation status, courses taken and grades

*Interview*

Interviews will be scheduled for the most suitable applicants, based upon full meeting of the prerequisites and a program assessment of the selection criteria. As well as seeking further information from short listed applicants, the interview explores comprehension, English fluency and organization of thoughts and ideas.

All applicants invited to an interview will be asked to write a one paragraph, hand-written answer to a short question. This will take place immediately prior to the interview. The answer will be assessed for content, clarity and legibility. The question will relate to the selection criteria.

The interviews take place in early May.

### Selection Process

Admission does **not** happen on a first come – first served basis. The process is competitive. Due to the large number of applicants and limited number of seats, top down selection is employed, with the most suitable applicants invited to join the program. Some applicants may meet the minimum requirements for admission and not be invited to join the program. Applications are accepted by the BCIT Admissions department after October 1 for entry the following September. Completed applications will be reviewed by the program area in March.

**Note:** Applicants should fully outline how the selection criteria has been met. Please do not assume that BCIT has knowledge of your past experiences.

### Post-Interview Entrance Requirements

Following provisional acceptance after the interview, full acceptance into the program will be granted upon submission of:

- Proof of current Cardiopulmonary Resuscitation Level C
- A signed consent for full participation in scan labs held at BCIT
- A completed health form.

### Program Content — 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	5112	Abdominal Sonography I	4.5	4.5
DSON	5113	Obstetrical/Gynecology Sonography I	3.5	3.5
DSON	5116	Clinical Exp in Sonography I	14.0	14.0
PHYS	5273	Physics for Ultrasound	4.5	4.5

#### Level 6 (35 weeks including exam week and spring break)

			hrs/wk	credits
DSON	6112	Abdominal Sonography 2	1.5	1.5
DSON	6113	Obstetrical/Gynecological Sonography 2	1.5	1.5
DSON	6114	Vascular Sonography	1.5	1.5
DSON	6115	Echocardiography	1.5	1.5
DSON	6116	Clinical Exp in Sonography 2*	31.5	70.0
PHYS	6273	Physics for Ultrasound 2	1.0	1.0

All courses have a 60 per cent pass mark.

\* For DSON 6116 students complete 28 hours per week of clinical training during Term A (17 weeks) and 35 hours per week of clinical training during Term B (16 weeks)



## Diagnostic Medical Sonography cont.

### Faculty and Staff

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Nancy Chouinard, B.Sc., RDMS, nchouina@bcit.bc.ca

### Clinical Coordinators

B.C. Children's Hospital, Mumtaz Karmali, RDMS

B.C. Women's Hospital, Sue Jamieson, RDMS

Eagle Ridge Hospital, Dianne Hagen, RDMS

Lion's Gate Hospital, Rachel MacAulay, RDMS

Ann Thur, RDMS

Royal Columbian Hospital, Neil Venir, B.A., RDMS

St. Paul's Hospital, Paul Stecyk, RDMS

Surrey Memorial Hospital, Heather Gretchen, RDMS

Vancouver General Hospital, Wendy Forrest, RDMS

Monique Koehle, RDMS

## Electroneurophysiology Technology

### Two-year Diploma Program (Full-time)

Modern hospitals and healthcare 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 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.

### Entrance Requirements

This program is offered every second year, with the next intake scheduled for September 2000.

High school graduation. English 12 (C+). Math 12 (C+). Physics 11 (C+). Chemistry 11 (C+). Biology 12 (C+). 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.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

### Program Length

Two years, full-time beginning in September of alternate years.

### Tuition Fees 1999/2000 (subject to change)

\$4676.60 for the two-year program.

### Books and Supplies 1999/2000

Year 1: \$755 (general estimated cost and subject to change).

### Program Content

\*Electroneurophysiology is currently under curriculum review. There may be adjustments to the courses described below.

*continued next page*

## Electroneurophysiology Technology cont.

### Program Content — Electroneurophysiology Technology

Level 1	(15 weeks)	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	Electroneurophysiology I	4.0	4.0
MATH 1791	Technical Mathematics for Electroneurophysiology	5.0	
Level 2	(20 weeks)	hrs/wk	credits
PHYS 2279	Physics for Electroneurophysiology	3.0	3.0
BHSC 2212	Anatomy and Physiology	4.0	5.5
COMM 2280	Communication/ Applied Research	4.0	2.5
ENPY 2250	Electroneurophysiology 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	(15 weeks)	hrs/wk	credits
BHSC 1339	Human Behavior	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	Electroneurophysiology 3	4.0	4.0
ENPY 3353	Nerve Conduction Techniques	5.0	5.0
Level 4	(20 weeks)	hrs/wk	credits
ENPY 4450	Electroneurophysiology Practicum	46.5	

### Faculty and Staff

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*Live simpler -  
consume less.*

## Environmental Health (Public Health Inspector Training)

### Four-year Degree Program (Full-time)

### Two-year Degree Program

### Direct-Entry (Full-time)

The Public Health Inspector/Environmental Health Officer (PHI/EHO) is a vital member of the public health team and delivery system. The role of the PHI/EHO 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, regional, provincial and national health agencies, environmental and pollution control agencies, by-law enforcement, health education as well as private businesses and industries such as food processing, catering and fisheries.

### The Program

The cross-disciplinary curriculum includes general studies in health and the health engineering sciences, liberal education, health care management, math and the physical and social sciences. Students are made aware of the many health hazards in the environment and develop skills to measure, evaluate and recommend controls for these hazards. Instructional modes include lectures, labs, guided learning, field trips, directed studies and practical experiences. Environmental health is a complex and rapidly changing area of human endeavor. A firm foundation of education and experience in science and health is provided.

### Program Length

**Four-Year:** The program is four years long and begins in September of each year. The first three years consist of full-time studies on campus. The fourth year combines practical experience with guided learning (distance education). Practical experiences may also be completed during the summer months.

**Direct-Entry:** The program is two years long and begins in September of each year. The first year consists of full-time studies on campus followed by a practical experience during the summer months. The second year consists of on-campus studies followed by a combination of practical experience and guided learning (distance education). The second practical experience may also be completed during the summer months.

### Entrance Requirements and Selection Criteria

**Four Year:** High school graduation. English 12. Math 12. Chemistry 12. Physics 11. Biology 11. Preference is given to applicants who have completed their entrance requirements within 5 years of applying, and have achieved a (C+) standing in the entrance requirement 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.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

#### Direct Entry:

1. B.Sc. or equivalent\*, or a related science-oriented Diploma of Technology with a least one B.C. university-level course in each of the following topics:

- Biology
- Microbiology
- Chemistry
- Math or Calculus
- Biostatistics or Statistics

\* Applicants who have completed non-Canadian post-secondary studies may be requested to have a Comprehensive Evaluation of their credentials done by the International Credential Evaluation Service (ICES).

#### 2. English 12

Applicants who do not meet these requirements may be considered on an individual basis.

In addition, preference will be given to applicants who have:

- also taken B.C. university-level courses in Anatomy and Physiology, Organic Chemistry, Biochemistry, Physics and Computer Skills
- completed their entrance requirements within five years of applying and who have achieved a C+ (65 per cent) standing or better in these courses.

**Note:** Applicants who are accepted into the Direct-Entry program will be responsible for the content of courses from which they are exempted for the purpose of completing requisite courses. For example, the noise component of the Environmental Assessment course requires a knowledge of the physiology & anatomy of the human ear as well as an understanding of wave theory and logarithms. Students will be provided with course outlines from exempted courses for reference as they progress through the program.

### Program Structure

#### Structure of the Four-Year Program Technical Component

1. Specialty Courses .....	156 credits
2. Management Courses .....	9
3. Practical Experience .....	10
Liberal Education .....	12
<b>Total .....</b>	<b>187 credits</b>

#### Structure of the Direct-Entry Program Technical Component

1. Specialty Courses .....	92 credits
2. Management Courses .....	9
3. Practical Experience .....	10
Liberal Education .....	12
Block Transfer Credit .....	64
<b>Total .....</b>	<b>187 credits</b>

### 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 public.

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## Environmental Health cont.

### 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. We recommend that you acquire keyboarding (typing) skills in preparation for computer use.

### Selection Process

Applications are received by the Admissions department after October 1 for entrance in the following September. 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 (i.e. speaking to a practicing PHI/EHO);
  - how your past experience has prepared you for this career (briefly highlight relevant experience).
3. Reference letters (three maximum) which refer to your maturity, your ability to communicate, and any other personal attributes that will be of benefit in this career.

Please clearly specify "Environmental Health" on your application to prevent confusion with other BCIT programs. If you are applying for the Direct Entry (Two year) program, please clearly specify this as well. 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 BCIT student number 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.

### Industry (Practical) Experience

Practical experience is a significant component of this program. It consists of industry-related projects courses (Industry Project 1 and 2, Research Methods and Applied Research Project) as well as six months of off-campus experience in an appropriate agency (Practicum and Internship). Additional information for the Practicum and Internship courses:

- you will need a valid driver's license and access to a vehicle
- these courses are required for graduation
- the positions are unpaid
- a limited number of positions are available in the Lower Mainland so you may have to relocate
- you are responsible for accommodation and transportation associated with these positions.

### Professional Association Registration

The BCIT Environmental Health Program is recognized by the Canadian Institute of Public Health Inspectors (CIPHI) for certification. The Program is also affiliated with the International Federation of Environmental Health.

There is a requirement to become certified prior to being eligible to work as a PHI/EHO in many locations across Canada. The certification process is additional to the academic work at BCIT and is accomplished through the Board of Certification (BOC) of the Canadian Institute of Public Health Inspectors. The Certification exam has both written and oral components; the cost is currently \$400 (subject to change). To be eligible for certification you must complete 12 weeks of practicum (field experience) under the supervision of a Certified Public Health Inspector. The practicum can be completed after the second or third academic year.

### Tuition Fees 1999/2000 (subject to change)

First-year and Second-year: \$1,169 each term (Fall and Winter terms).

Third-year and Fourth-year: \$1,800 each term (Fall and Winter terms, to a maximum of \$3,600 per year).

### Direct Entry

First and Second year: \$1,800 each term (Fall and Winter terms, to a maximum of \$3,600 per year).

### Graduation Requirements

**Four-Year Program:** Students are required to complete 12.0 credits of Liberal Education prior to graduation from the program. Liberal Education courses are not taught at BCIT and it is the responsibility of the student to complete approved credits at an alternative Post-Secondary Institution.

## Environmental Health cont.

**Direct-Entry Program:** Students are required to complete 12.0 credits of Liberal Education prior to graduation from the program. Liberal Education courses are not taught at BCIT and it is the responsibility of the student to complete approved credits at an alternative Post-Secondary Institution. Also, students are required to complete a Computer Skills course prior to graduation.

**For more information contact:**

Tom Rodwell, Program Assistant  
(604) 432-8429 or e-mail [troddwell@bcit.bc.ca](mailto:troddwell@bcit.bc.ca)

Lorraine Woolsey, Program Head  
(604) 432-8807 or e-mail [lwoolsey@bcit.bc.ca](mailto:lwoolsey@bcit.bc.ca)

**For Further Information on the Liberal Education component please contact:**

Bachelor of Technology department, Registrars Office, (604) 432-8230.

For more information on Bachelor of Technology programs offered at BCIT please refer to page 53 of this Calendar.

### Program Content

The four year program content is listed first and then the Direct-Entry program content follows.

**Note:** During the implementation of the Bachelor of Technology in Environmental Health, there may be adjustments to the program descriptions below.

**Four Year Degree program:**

First Year: Level 1 (15 weeks)			hrs/wk	credits
BHSC	1123	Microbiology I	3.0	3.0
CHEM	1108	Chemistry I for EH	6.0	6.0
ENVH	1100	Introduction to EH	3.0	3.0
ENVH	1210	Soils	3.0	3.0
ENVH	1220	Hydrogeology	3.0	3.0
MATH	1821	Technical Math for EH	4.0	4.0
OPMT	1119	Introduction to Information Systems	3.0	3.0

First Year: Level 2 (20 weeks)			hrs/wk	credits
BHSC	1204	Anatomy and Physiology <sup>B</sup>	4.0	2.5
BHSC	2223	Microbiology 2	3.0	4.0
CHEM	2208	Chemistry 2 for EH	6.0	8.0
ENVH	1300	Food Hygiene	6.0	8.0
ENVH	2200	Water Supply <sup>A</sup>	4.0	2.5
PHYS	1282	Physics for EH	3.0	4.0

*Liberal Education elective <sup>1</sup>*

Second Year: Level 3 (15 weeks)			hrs/wk	credits
COMM	1282	Communication for EH I	3.0	3.0
ENVH	1143	Pools and Recreational Water	4.0	4.0
ENVH	2100	EH Legislation	3.0	3.0
ENVH	2210	Sewage Disposal Methods	3.0	3.0
ENVH	3600	Environmental Assessment	5.0	5.0
FOOD	3020	Food Microbiology for EH	4.0	4.0

*Liberal Education elective <sup>1</sup>*

Second Year: Level 4 (20 weeks)			hrs/wk	credits
CHEM	3321	Toxicology for EH	2.5	3.0
COMM	2382	Communication for EH 2	3.0	4.0
ENVH	1124	Pest Management <sup>A</sup>	4.0	2.5
ENVH	2700	Biostatistics	3.0	3.5
ENVH	3100	Applied Law	4.0	5.5
ENVH	3200	Land Use <sup>B</sup>	4.0	2.5
ENVH	3500	Human Relations	3.0	4.0
ENVH	4300	Food Equipment and Processing <sup>B</sup>	4.0	2.5
ENVH	4600	Indoor Air Quality <sup>A</sup>	5.0	3.5

Third Year: Level 5 (15 weeks)			hrs/wk	credits
BUSA	7250	Management Skills and Applications <sup>2</sup>	3.0	3.0
CHEM	7313	Analytical Measurements	4.0	4.0
ENVH	7001	Solid and Hazardous Waste	3.0	3.0
ENVH	7002	Outdoor Air Quality	3.0	3.0
ENVH	7266	Epidemiology	5.0	5.0
ENVH	7400	Industry Project I	3.0	3.0

Third Year: Level 6 (20 weeks)			hrs/wk	credits
BHSC	7423	Communicable Disease Control	4.0	5.5
CHEM	8422	Environmental Chemistry	5.0	6.5
ENVH	7410	Industry Project 2	6.0	8.0
ENVH	8001	Environmental Risk Assessment	2.5	3.0

Management elective courses <sup>3A</sup>

Management elective courses <sup>3B</sup>

Fourth Year: Level 7 and 8 (35 weeks)			credits	
ENVH	7500	Practicum (Practical Experience)	3.0	
ENVH	8400	Research Methods (Guided Learning)	3.0	
ENVH	8410	Applied Research Project (Directed Studies)	5.0	
ENVH	8500	Internship (Practical Experience)	7.0	

*Liberal Education elective <sup>1</sup>*

*Liberal Education elective <sup>1</sup>*

**Notes** (see superscripts above):

A Designates courses of 10 week duration offered during the first 10 weeks of the term.

B Designates courses of 10 week duration offered during the last 10 weeks of the term

*continued next page*

## Environmental Health cont.

1. Liberal Education courses are not currently offered at BCIT. These courses must be taken at other institutions (see "The Liberal Education Component" information sheet and contact Lois Nightingale at (604) 432-8230 for more information).
2. BUSA 7250 is offered as a guided learning course. The student is responsible for registering for this course in the appropriate term.
3. Management elective courses can be selected from ENVH 7606 or HMG 4140, 4150, 4210, 4310, and 5140 (see course descriptions). A total of 6 credits of elective courses are required.

### Direct-Entry Degree program

Level 5 (15 weeks)			hrs/wk	credits
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
ENVH	2210	Sewage Disposal Methods	3.0	3.0
ENVH	3600	Environmental Assessment	5.0	5.0
FOOD	3020	Food Microbiology for EH	4.0	4.0

### Level 6 (20 weeks) Full Term

CHEM	3321	Introduction to Toxicology	2.5	3.0
BHSC	7423	Communicable Disease Control	4.0	5.5
ENVH	1300	Food Hygiene	6.0	8.0
ENVH	3100	Applied Law	4.0	5.5

### First 10 weeks

ENVH	2200	Water Supply	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	4300	Food Equipment and Processing	4.0	2.5

### Final 12 weeks

ENVH	7500	Practicum Practical experience		
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### Level 7 (15 weeks)

CHEM	7313	Analytical Measurements	4.0	4.0
ENVH	7266	Epidemiology	5.0	5.0
BUSA	7250	Management Skills and Applications <sup>1</sup>	3.0	3.0
ENVH	2100	EH Legislation	3.0	3.0
ENVH	7001	Solid & Hazardous Waste	3.0	3.0
ENVH	7002	Outdoor Air Quality	3.0	3.0
ENVH	8400	Research Methods	3.0	3.0
Liberal Education elective <sup>2</sup>				

Level 8 (20 weeks) Full term			hrs/wk	credits
ENVH	8410	Applied Research Project (Directed Studies)	4.0	5.0
Liberal Education elective <sup>2</sup>				

### First 10 Weeks

CHEM	8432	Environmental Chemistry	4.0	2.5
Management elective course <sup>3</sup>				
ENVH	8001	Environmental Risk Assessment	5.0	3.0
ENVH	1124	Pest Management	4.0	2.5

### Second 10 weeks

Management elective course <sup>3</sup>				
ENVH	8500	Internship Practical experience		

### Notes (see superscripts above):

- Designates courses of 10 week duration offered during the first 10 weeks of the term.
  - Designates courses of 10 week duration offered during the last 10 weeks of the term
- Liberal Education courses are not currently offered at BCIT. These courses must be taken at other institutions (see "The Liberal Education Component" information sheet and contact Lois Nightingale at (604) 432-8230 for more information).
  - BUSA 7250 is offered as a guided learning course. The student is responsible for registering for this course in the appropriate term.
  - Management elective courses can be selected from ENVH 7606 or HMG 4140, 4150, 4210, 4310, and 5140 (see course descriptions). A total of 6 credits of elective courses are required.

### Faculty and Staff

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This information is updated annually. Please be sure you are reviewing the current version.

## Medical Imaging

### Bachelor of Technology Degree (Part-time)

BCIT is offering Canada's first degree completion baccalaureate-level program in Medical Imaging. The Bachelor of Technology in Medical Imaging will be available by distance education to registered Medical Imaging technologists from across Canada and other parts of the world who have completed two years of relevant work experience. This program addresses the pressing need for advanced education resulting from the significant technical and clinical advances that have occurred in medical imaging in recent years.

New developments in medical radiography, nuclear medicine and diagnostic sonography have dramatically increased the knowledge base needed to function competently in modern imaging departments. The skills and responsibilities of senior imaging technologists have expanded to the point where they need a baccalaureate-level education to be adequately prepared for the technological challenges of their profession. In many parts of the world baccalaureate education is now the norm for medical imaging technologists. BCIT's Bachelor of Technology in Medical Imaging will establish a universally recognized educational standard for medical imaging in Canada and provide formal recognition of the high level of education required by the profession.

The BCIT Bachelor of Technology in Medical Imaging degree program currently offers specialization in radiography, which involves the use of X-rays to produce radiographs (X-ray films) for diagnostic purposes. Specialization in nuclear medicine, which makes use of measured doses of radioactive material to obtain information about a patient's condition, and sonography, in which high-frequency sound waves are used to produce images for diagnostic purposes, are also under consideration. This document presents information related to the radiography specialization only.

The target group for the Bachelor of Technology in Medical Imaging is registered medical imaging technologists with a diploma of technology or equivalent.

### The Program

The Bachelor of Technology degree completion program is offered in a distance education format. These guided learning courses involve self-directed study supported by telephone tutoring. The courses are advertised in the Part-time Studies Course Offerings booklet as well as on the BCIT Web site.

### Application Procedures

Individuals interested in applying for entry into the Bachelor of Technology, Medical Imaging program should contact the program head, Medical Imaging or Registration and Information for an information/admission package. This information package will include a BCIT degree application form.

### Admission Procedures

Individuals submit a completed "Application: Bachelor of Technology" form to the Admissions department in the Registrar's Office. To be included with this application are

- official documents of all previous post-secondary education
- official documents showing successful completion of English 12 or equivalent
- a letter or resume indicating completion of two years of relevant work experience.

### Registration Procedures

Individuals will register for courses by following BCIT's standard procedures for registering in a distance education course. This can be accomplished in one of five ways:

1. By Mail: complete the Registration form and mail it with a cheque or credit card number (Visa or MasterCard) to BCIT Registration.
2. By Fax: complete the Registration form and fax to (604) 430-1331. Payment must be made by Visa or MasterCard at the time of registration.
3. By Phone: Registration is accepted at (604) 434-1610 providing fees are paid by Visa or MasterCard.
4. In Person: At the BCIT Burnaby Campus. Payment must be made at the time of registration.
5. Through the Internet: [www.bcit.bc.ca](http://www.bcit.bc.ca).

Individuals are encouraged to receive acceptance into the program prior to starting any of the course work. Course work completed prior to acceptance into the program may not be transferable into the program.

### Program Length

The Bachelor of Technology degree must be completed within six years from acceptance into the program.

Candidates should be aware that, prior to acceptance into the program, they may complete:

- a maximum of 6 credits of Technical Component course work
- a maximum of 12 credits of Liberal Education Component course work.

### Entrance Requirements

The entrance requirements for the Bachelor of Technology in Medical Imaging are -

- BCIT Diploma in Medical Radiography, or equivalent
- English 12, or equivalent
- Two years of relevant work experience

### Course Transfer Credit

Within the Technical Component, a maximum of 18.0 credits can be transferred in from another Institution.

Within the Liberal Education Component, a maximum of 12.0 credits must be transferred in from another Institution.

*continued next page*

## Medical Imaging cont.

### Program Content

#### Technical Component (48.0 credits)

- Required courses (24.0 credits)
- Elective courses (15.0 credits)
- Management courses (9.0 credits)

#### Liberal Education Component (12.0 credits)

- Students must complete 12.0 credits of Liberal Education.  
For further information please contact the Registrar's Office at (604) 432-8230.

For more information on Bachelor of Technology programs offered at BCIT please refer to page 53 of this Calendar.

### Program Structure

Required Courses (24.0 credits)			credits
MIMG 7000	Technological Advances in X-ray Imaging	3.0*	
MIMG 7001	Understanding Radiation Risks in Medical Imaging	3.0**	
MIMG 7002	Medical Radiation Protection	3.0	
MIMG 7003	Digital Imaging Concepts	3.0	
MIMG 7004	Advanced Topics in Patient Care	3.0	
MIMG 7005	Ethics in Health Sciences	2.0	
MIMG 7006	Understanding Research in Health Sciences	3.0	
MIMG 7007	Image Quality in Diagnostic Radiology	4.0	

\* Individuals who have completed a CT or MRI certificate program, within the last five years, are not required to complete MIMG 7000.

\*\* Individuals who have completed a Mammography certificate program, within the last five years, are not required to complete MIMG 7001.

#### Elective Courses (15.0 credits required)\*\*\*credits

BHSC 7601	Sectional Anatomy/ Abdomen and Pelvis	3.0
BHSC 7602	Sectional Anatomy/Thorax	3.0
BHSC 7603	Sectional Anatomy/Head and Neck*	3.0
BHSC 7604	Sectional Anatomy/Musculoskeletal System	3.0
MIMG 7100	Imaging the Digestive Tract	3.0
MIMG 7101	Advances in Special Procedures	3.0
MIMG 7103	Quality Assurance in Diagnostic Radiology**	3.0
MIMG 7200	MRI I/Physical Princ and Instrument'n	3.0
MIMG 7201	MRI 2/Image Prod and Tissue Charact	3.0
MIMG 7202	MRI 3/Imaging Tech, Q.C., Artifacts	3.0
MIMG 7300	Comp Tomography/Phys Princ, Instru	3.0
MIMG 7301	Comp Tomography/Clinical Applications	3.0
MIMG 7400	Breast Imaging I	3.0
MIMG 7401	Breast Imaging 2	1.0

\* (CAMRT Sectional Anatomy II and III will receive credit until April 1999)

\*\* (CAMRT Quality Control I, II, and III)

\*\*\* CT and MRI certificate holders are not required to complete this section if they have achieved their certificate within the last five years. Exemption is granted based on course work previously completed.

### Management courses

Required:		credits
BUSA 7250	Management Skills and Applications	3.0

### Elective Courses

Students must choose 6.0 credits of course work from the list below.

		credits
HMGT 5130	Information Systems in Healthcare I	3.0
HMGT 5230	Information Systems in Healthcare 2	3.0
HMGT 4140	Budgeting in Healthcare	1.5
HMGT 4150	Human Resource Management	3.0
HMGT 4160	Health Labor Relations I	1.5
HMGT 4310	Conflict Management in Health	3.0
HMGT 4410	Managing Organizational Change and Development	3.0
HMGT 4450	Team Building for Healthcare Managers	3.0
HMGT 5120	Healthcare Principles of Management	3.0
HMGT 5170	Healthcare Law I	3.0

### Faculty and Staff

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## Medical Laboratory Technology

### Diploma Program

The Medical Laboratory Technology has been interrupted to allow for extensive curriculum redesign. Pending approval, the revised program hopes to accept applications for a September 1999 intake. Please do not apply for this program until you have confirmed that the program will be running.

For further information on the program redesign and future intakes, please contact Karen Nicolson at (604) 432-8831, email knicolso@bcit.bc.ca

For inclusion in the future program mailing list, please contact BCIT Student Services at (604) 434-1610.



## Medical Radiography Technology

### Two-and-a-Half-Year Diploma Program (Full-time)

The medical radiographer is a technologist who works as part of the health team composed of radiologists, internists, surgeons, nurses, laboratory technologists, biomedical technologists, nuclear medicine technologists, sonographers and other specialists. Radiographs are widely used as an aid in making medical diagnoses. A radiograph (X-ray) may be a routine film of the chest or a broken finger or it may form part of the sophisticated examinations used in the detection of heart, blood vessel or brain abnormalities. Radiographers work under the direction of a medical specialist (a radiologist) in the hospital radiology department, at the patient's bedside or in the operating room or Emergency department. Radiographers are also employed in private X-ray clinics.

Medical radiography is not a hazardous occupation. The dangers of radiation are well recognized and rigidly controlled. The conscientious radiographer can derive much personal satisfaction as a contributor to the success of the health team and the well-being of the patient. Medical Radiography is a field suited to both men and women.

During training, medical radiography students receive intensive theoretical and practical instruction in lectures, labs and tutorials at BCIT, as well as practical experience in hospitals. Students are expected to participate as patients to practise 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

Currently in this field, graduates find employment in casual positions with one or more employers. This seems to be the trend for the future. Graduates can find themselves employed in a casual position for four to five years before obtaining a permanent position if not prepared to move away from major centres or outside of the lower mainland area. The healthcare system as we currently know it is in a transition phase. Entering the Medical Radiological field means that you are prepared for life-long learning as your chosen career continues to change, grow and advance.

### 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.

### Tuition Fees 1999/2000 (subject to change)

\$4676.60 for the two-year program.

### Books and Supplies 1999/2000

Level 1: \$1000; Level 2 and 3: \$395; Level 4 and 5: \$500 (general estimated cost and subject to change).

### Entrance Requirements

High school graduation. English 12(B) or 6.0 credits of 1st year English from UBC or equivalent. Math 12(C+). Physics 11(C+). Physics 12(C+). Biology 11(C+). Biology 12(C+). These entrance requirements must have been completed during the past 5 years. If longer than five years has elapsed, upgrading in the required subjects will be necessary.

Also required are basic keyboarding and computer skills and a minimum 40 hours of volunteer work in a hospital such as Candy Striping and Basic Life Support (Level C).

Applicants must have a strong sense of responsibility, a caring nature, an interest in the well-being of others, particularly the sick and injured, excellent interpersonal skills, strong problem-solving skills and the ability to function as part of a team. Applicants should be aware that the profession is both physically and mentally demanding and therefore requires individuals who cope well in a stressful environment.

Applicants must also complete an immunization program as well as a medical examination by a qualified physician. A pre-admission interview 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, following a two-day clinical orientation in a radiology department.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

### Accreditation

The program is accredited by the Canadian Medical Association-Conjoint Accreditation Services.

### Transfer Credit/Degree Completion

BCIT offers a degree completion Bachelor of Technology in Medical Imaging. This degree continues on from the Medical Radiography two-year Diploma. Simon Fraser University grants 57 credits towards a Bachelor of Science degree to graduates of the diploma program.

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## Medical Radiography Technology cont.

### Program Content — 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 Behavior 1	1.0	1.0
MRAD	1102	Medical Imaging 1	3.0	3.0
MRAD	1104	Radiographic Anatomy and Physiology 1	3.0	3.0
MRAD	1106	Radiographic Procedures 1	9.0	9.5
MRAD	1107	Clinical Orientation	3.0	3.0
MRAD	1108	Clinical Education 1*	35.0	9.5
NURS	1180	Patient Care	2.0	2.0
PHYS	1272	Physics for Medical Radiography	5.0	5.5

\*Students are in hospitals for clinical experience for four weeks (35 hr/wk) 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	2204	Radiographic Anatomy and Physiology 2	4.0	2.0
MRAD	2205	Case Studies 1	3.0	2.0
MRAD	2206	Radiographic Procedures 2	10.0	7.5
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. For the first six weeks of the school term students attend classroom/lectures on a full time basis. For the remainder of the term, students alternate every two weeks between BCIT classroom/lecture hours and the clinical area (scheduled for 35 hours per week).

#### Year two Level 3 January to April (16 weeks)

			hrs/wk	credits
BHSC	2241	Human Behavior	3.0	1.5
COMM	1372	Communication for Medical Radiographers	4.0	2.0
MRAD	3300	Clinical Education 3	35.0	16.0
MRAD	3304	Radiographic Anatomy and Physiology 3	3.0	1.5
MRAD	3305	Case Studies 2	3.0	1.5
MRAD	3306	Radiographic Procedures 3	8.0	4.0
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	2.0	1.0

Level 3 is 16 weeks in length, including exam week. Students spend two week blocks alternating between clinical hours and then classroom/lecture hours. Therefore, although the school term is 16 weeks in length, total classroom time is 8 weeks and total clinical time is 8 weeks. Clinical weeks are scheduled at 35 hours a week.

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	35.0	39.5

Levels 4 and 5 total either 49 or 48 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 per cent pass mark.

### Faculty and Staff

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Lions Gate Hospital, Anna Grace, R.T.R.

Kelowna General Hospital, Patti Anderson, R.T.R.

Prince George Regional Hospital, Helen Domshy, R.T.R.

Richmond Hospital, Margaret McDonald, R.T.R.

Royal Columbian Hospital, Henry Ross, R.T.R.

Royal Inland Hospital, Anna Yoshida, R.T.R.

St. Paul's Hospital, Joanne Peterson, R.T.R.

University Hospital, UBC Site, Spencer Dearing, R.T.R.

Vancouver Hospital and Health Sciences Centre

Phylis Washlyshyn, R.T.R.

*Use baking soda  
for scrubbing  
sinks, bathtubs  
and counters.*



## Nuclear Medicine Technology

### Two-Year Diploma Program (Full-time)

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 radioactive 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.

### 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 several Lower Mainland hospitals. The summer term of second year is spent in a nuclear medicine department gaining further clinical experience.

On successful completion of the two-year (six-term) program, the student receives the BCIT Diploma of Nuclear Medicine Technology and is eligible to write national certification examinations.

### Program Length

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

### Tuition Fees 1999/2000 (subject to change)

\$4676.60 for the two-year program.

### Books and Supplies 1999/2000

First-year: \$1197; Second-year: \$854 (general estimated cost and subject to change).

### Entrance Requirements

High school graduation. English 12(C+). Math 12(C+). Chemistry 12(C+). Physics 11(C+). Biology 11 is also strongly recommended. These entrance requirements 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 healthcare 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 Emergency First Aid Safety Oriented First Aid course (this course includes CPR Level C) or its equivalent, prior to admission or during the first term of the program.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

*continued next page*

## Nuclear Medicine Technology cont.

### Degree Completion

Simon Fraser University grants two years credit toward 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 and by the Joint Review Committee for Educational Programs in Nuclear Medicine Technology in the United States.

### Program Content — Nuclear Medicine Technology

Level 1	(15 weeks)	hrs/wk	credits
BHSC 1106	Anatomy and Physiology I	5.0	5.0
BHSC 1126	Medical Microbiology and Immunology	2.0	2.0
CHEM 1116	Chemistry I for Nuclear Medicine Technology	4.0	4.0
MATH 1751	Technical Mathematics for Nuclear Medicine	4.0	4.0
NMED 1116	Nuclear Medicine Laboratory Skills	3.0	3.0
NMED 1020	Radio pharmaceuticals I	4.0	4.0
NMED 1040	Introduction to NMT	2.0	2.0
PHYS 1274	Physics for Nuclear Medicine I	6.0	6.0
Level 2	(20 weeks)	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 2025	Radio pharmaceuticals 2	4.0	5.0
NMED 2040	Applied Physiology I	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)	hrs/wk	credits
NMED 2090	Clinical Experience 1	35.0	28.0

Level 3	(15 weeks)	hrs/wk	credits
BHSC 3306	Pathophysiology I	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	(20 weeks)	hrs/wk	credits
BHSC 1439	Human Behavior	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	35.0	20.0
PHYS 4274	Physics for Nuclear Medicine 4	5.0	3.0

Summer	(15 weeks)	hrs/wk	credits
NMED 4090	Clinical Experience 4	35.0	32.5

\* All courses have a 60 per cent 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.

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Linda Harrison, R.T.N.M.  
Victoria General Hospital, Debbie Tooby, R.T.N.M.

## Nursing

### Two-and-a-Half-Year Diploma Program (Full-time)

Nursing practice is a demanding, meaningful and rewarding profession for British Columbia's men and women. Today's registered nurse works with other healthcare professionals to help people manage their health. To function effectively, nurses must operate according to the Standards For Nursing Practice in British Columbia. Effective communication, continual learning, reasoning and reflection, and collaboration with other health professionals are especially important in nursing practice.

### Job Opportunities

Registered nurses are employed primarily in hospitals. Positions for new graduates are available mainly on medical and surgical units. The salary range for registered nurses is \$39,024 - \$48,348/annum (April, 1995). Additional payment is received for shift work, charge positions and additional qualifications.

### The Program

The BCIT Nursing program focuses on the preparation of nurses who will practise in healthcare institutions. BCIT has a history of strength in this area. Patient acuity and complexity of care in hospital nursing is increasing and students will be introduced to specialty nursing practice which will prepare them to select a clinical focus.

To help students develop the skills required in the healthcare system of tomorrow, the program will place emphasis on the development of professionalism; communication; reasoning and reflection; learning, creative leadership (including group process skills); and technical skills as well as on acquiring an integrated body of knowledge. To help students develop these skills, self-directed and problem-based learning is emphasized. Self-directed learning is a method that encourages students to take charge of their learning by identifying learning needs, implementing strategies to meet these learning needs, and evaluating progress toward learning. These skills prepare students for life-long learning. Problem-based learning is an approach in which a health 'problem' is presented as a starting point for learning. With the help of a tutor, students work together to identify the knowledge they need to nurse patients with the health problem. Three to four problems are presented in each course. Problem-based learning has two purposes: the development of a base of knowledge related to the problem and the development of reasoning and problem-solving skills. Because it occurs in groups of about 10 people, communication and group skills are developed as well.

The program offers courses in Nursing, Basic Health Sciences and English. Where possible, courses that would be eligible for university transfer credit will be offered. Learning opportunities in hospitals include practica in medical, surgical, obstetrical, pediatric, and psychiatric nursing areas. Other nursing areas are being considered. The hospital experiences could be during day, evening or night shifts. Computer use in hospitals is increasing so having computer literacy is an advantage to students in the program.

The BCIT Nursing program is approved by the Registered Nurses Association of British Columbia.

### Preparation for the Program

Those applicants wondering about the appropriateness of Nursing for them and those applicants wishing to prepare themselves for this program should read the book by M. Chenevert: Mosby's Tour Guide to Nursing School, 3rd. ed. It is available in the BCIT Bookstore on the Burnaby campus. It is also recommended that you attend a BCIT Information Session on the Nursing program, please call (603) 434-1610 for available dates. To enquire about becoming a "student-for-a-day" please call (604) 451-6954.

### Program Length

The program is two and one-third years in length and composed of five levels of 17 weeks each. The fall term extends from mid-August to mid-December and the winter term extends from January to mid-May. Students are free of studies from mid-May to mid-August.

### Tuition Fees 1999/2000 (subject to change)

\$5845.75 for the complete program.

### Books, Supplies and Miscellaneous Expenses (1999/2000)

Level 1 - \$1,000, Level 2 - \$550, Level 3 - \$535, Level 4 - \$650, Level 5 - \$1,000 for books and supplies (general estimated cost and subject to change). Additional expenses may be incurred. Uniforms and shoes are about \$250. The student is responsible for transportation to assigned hospitals. It is highly recommended that students have the use of a car. Level 1 students are required to join the Registered Nurses Association of British Columbia as student members. The membership fees are \$37.45 (subject to change) and includes a compulsory criminal search. If you have concerns about the criminal search please phone the RNABC. The yearly renewal membership is \$26.75 (subject to change).

*continued next page*

## Nursing cont.

### Entrance Requirements

Applicants must have all the admissions requirements completed at least 30 days prior to registration in order to be eligible for a seat.

#### 1. Academic (A or B must be completed):

A. High school graduation or GED or BTSD level 4 is required with:

- i. English 12(B) or better, or satisfactory completion of 6.0 credits of UBC English 100 courses (ENGL 112 + ENGL 110 required) or equivalent.
- ii. Chemistry 11(C+).
- iii. Math 11(C+)
- iv. Biology 12(C+) or BCIT course BHSC 0100(C+).  
Applicants must have completed Biology 12(C+) or BHSC 0100(C+) or a higher level biology course within the last five years. Although BHSC 0100 is not equivalent to Biology 12, it is acceptable for entry into the BCIT Nursing program.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

B. Successful completion of BCIT Engineering Technology Entry program (ETE or TEWELT) with the following minimum standings – COMM 0007 with 80 per cent; CHEM 0010 with 65 per cent; COMP 0107 with 50 per cent; NTRY 0301 with (S); MATH 0005 with 60 per cent; and Biology 12(C+) or BCIT course BHSC 0110 (C+). Biology 12 is not part of the ETE/TWELET program and must be completed at another institution or through BCIT Part Time Studies (BHSC 0100). For more information on these programs please call (604) 451-6815 or fax (604) 434-9451 or refer to page ?? of the BCIT 1999/2000 Full Time Calendar.

#### 2. Non-academic:

##### A. Employment or Volunteer Work:

For individuals with previous employment (does not have to be in the healthcare area), evidence of this employment and a satisfactory confidential reference is required. Work experience is preferred for all applicants. If applicants do not have work experience, volunteer experience in a healthcare area is required. The health-related volunteer experience must include a minimum of 30 hours of volunteer work with a satisfactory confidential reference.

##### B. Immunization:

Completion of the immunization form is required before final acceptance into the program.

##### C. 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.

##### D. Cardio-Pulmonary Resuscitation (CPR):

C.P.R. (Level C or Basic Rescuers) is required and must be kept valid during the entire program.

##### E. Some course assignments must be typed. Typing, word processing and computer skills are required.

##### F. On entry to the program, student membership in the Registered Nurses Association of British Columbia (RNABC) is required. A compulsory criminal record search will be done at this time. (Cost is borne by the student.) If you have any concerns please contact the RNABC.

##### G. You may be required to attend an interview. You will be contacted by BCIT if this is required.

##### H. Applicants with demonstrated ability (C+ grade or higher) in University level courses (any subject area) will be given preference for admission.

##### I. Recommended only: Library skills are an advantage to students in the program.

**Note:** Applicants with degrees within the past five years will be assessed individually to determine equivalency with academic criteria.

BCIT chooses those applicants considered to have the best chance for success in the program.

### Direct Entry

**Licensed Practical Nurses (LPN)** are eligible for consideration directly into the **SECOND** level of the Nursing program if the requirements outlined below have been met and a seat is available.

#### 1. Academic

A. Current **FULL** registration as a Licensed Practical Nurse in any Canadian province.

B. Graduate of a Licensed Practical Nursing program, and,

- i. Employment in patient care for a minimum of 1420 hours during the past five years is required; or,
- ii. Consideration may be made to graduates, within the past five years, who do not have the minimum 1420 hours. If this is your situation please include a letter outlining your work experience.

## Nursing cont.

### 2. Non-Academic

- A. One reference letter (non-family) which specifically addresses the potential for academic success and capability in nursing. If the applicant is a recent graduate, then this reference must come from a faculty member of their LPN program who is able to summarize their entire educational experience. If the applicant is employed in nursing, this reference is to be from her/his employer.
- B. Also required are points b) through i) in the Non-Academic requirements as outlined for entry into level one of the Nursing program (see above).

**Registered Psychiatric Nurses (RPN)** are eligible for consideration directly into the THIRD level of the Nursing program if the requirements outlined below have been met and a seat is available.

### 1. Academic

- A. Current ACTIVE registration as a Registered Psychiatric Nurse in any Canadian province.
- B. Graduate of a Registered Psychiatric Nursing program, and,
  - i. Employment in patient care for a minimum of 1420 hours during the past five years is required; or,
  - ii. Consideration may be made to graduates, within the past five years, who do not have the minimum 1420 hours. If this is your situation please include a letter outlining your work experience.

### 2. Non-Academic

- A. One reference letter (non-family) which specifically addresses the potential for academic success and capability in nursing. If the applicant is a recent graduate, then this reference must come from a faculty member of their LPN program who is able to summarize their entire educational experience. If the applicant is employed in nursing, this reference is to be from her/his employer.
- B. Also required are points B) through I) in the Non-Academic requirements as outlined for entry into level one of the Nursing program (see above).

**Note:** Additional credit for direct entry students will be dealt with on a course-by-course basis following BCIT course exemption procedures. Students who wish to continue onto the proposed BCIT Nursing Bachelor of Technology Degree Program may be required to have BCIT ENGL 1177 Academic Writing or an acceptable equivalent.

## Advanced Training/Degree Completion

Graduates may elect to undertake one of the many part-time advanced Diploma programs at BCIT or elsewhere in B.C., Canada, or the U.S., to further their knowledge and/or skills in specialty areas of nursing. Most universities in major cities offer Bachelor of Nursing programs for graduates of diploma nursing programs. All B.C. universities recognize diploma nursing preparation, thus reducing the four year program. The specific time reduction depends on the degree granting institution. BCIT offers a Bachelor of Technology in Specialty Nursing. Specialty Nursing programs are offered in Critical Care, Emergency, Neonatal, Nephrology, Pediatric, Pediatric Critical Care, Perinatal, Occupational Health and Perioperative Nursing. For more information, contact BCIT Registration and Information at (604) 434-1610.

## Professional Registration

Following completion of the nursing program at BCIT, graduates must write the Canadian registration examinations to obtain the RN (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 RNABC \*(The 1996-CNATS fee is \$210. It is subject to change without notice).

For more information about the BCIT Nursing program please contact Registration and Information at (604) 434-1610 or visit our web site at [www.bcit.bc.ca](http://www.bcit.bc.ca)

We invite you to attend one of BCIT's Nursing Information Sessions held throughout the year. To find out about and register for the next available Information Session please contact Registration and Information at (604) 1610. Information sessions have been scheduled through the year including February 22, 1999 and March 15, 1999.

## Program Content — Nursing

Level 1	(17 weeks)	credits
BHSC 1103	Physiology and Pathophysiology I	3.5
PSYC 1101	Introductory Psychology I	3.0
ENGL 1177	Academic Writing	3.0
NURS 1000	Nursing and Health Issues	3.5
NURS 1019	Clinical Techniques I-Assessment	3.5
NURS 1020	Clinical Techniques I -Laboratory	3.5
NURS 1030	Nursing Practicum I	8.0
NURS 1040	Professional Practice Seminar I	2.5
Level 2	(17 weeks)	credits
BHSC 2228	Microbiology for Nursing	2.0
BHSC 2853	Physiology and Pathophysiology 2	3.5
NURS 1050	Interpersonal Communication	2.0
NURS 2000	Nursing and Health Issues 2	3.5
NURS 2020	Clinical Techniques 2 -Laboratory	3.5
NURS 2030	Nursing Practicum 2	13.0

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## Nursing cont.

Level 3	(17 weeks)	credits
BHSC 3329	Immunology for Nursing	3.5
PSYC 1102	Introductory Psychology 2	3.0
ENGL 2377	Approaches to Literature	3.0
NURS 1060	Pharmacology	2.0
NURS 3000	Nursing and Health Issues 3	3.5
NURS 3030	Nursing Practicum 3	15.0

Level 4	(17 weeks)	credits
NURS 2040	Professional Practice Seminar 2	2.0
NURS 3020	Clinical Techniques 3 -Laboratory2.0	
NURS 4000	Nursing and Health Issues 4	3.5
NURS 4030	Nursing Practicum 4	15.0

Level 5	(17 weeks)	credits
NURS 4530	Nursing Practicum 5	40.5

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## Occupational Health and Safety

### Two-Year Diploma Program (Full-time)

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 labor 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.

### Tuition Fees 1999/2000 (subject to change)

\$4676.60 for the two-year program.

### Books and Supplies 1999/2000

First-year: \$1463; Second-year: \$1003 (general estimated cost and subject to change).



## Entrance Requirements

High school graduation. English 12. Math 12. Chemistry 11. Physics 11. Candidates will be interviewed. Preference will be given to applicants who have completed the entrance requirements within five years prior to application.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

## Engineering Technology Entry (ETE)

This full-time day school program provides academic upgrading to students wishing to enrol in engineering-based technology programs at BCIT.

For information about the ETE program, please refer to page 51 of this calendar.

## Technology Entry with English Language Training Program (TEWELT)

This program is offered through Academic Studies and runs concurrently with the ETE January intake. Computer literacy, math and physics lectures are common courses with ETE, but TEWELT has its own extended communication course which focuses on skills needed by students who require English language training. For more information about the TEWELT program please refer to page 52 of this calendar.



*Plug-in to  
Mother Nature.*

## Program Content — 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 I	3.0	3.0
CHEM 1115	Chemistry 1 for OCHS	6.0	6.0
COMM 1188	Communication I for OCHS Professionals	3.0	3.0
MATH 1881	Technical 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 I for OCHS	5.0	5.0

Level 2	(20 weeks)	hrs/wk	credits
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	(15 weeks)	hrs/wk	credits
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	5.0
HRMG 3220	Industrial Relations for OCHS	3.0	3.0
OCHS 1300	Ergonomics	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

Level 4	(20 weeks)	hrs/wk	credits
CHEM 4418	Industrial Chemistry for OCHS	3.0	4.0
CHSC 1488	Engineering Concepts for OCHS	3.0	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
ENVH 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

\* denotes a half term (10-week) course

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## Prosthetics and Orthotics Technology

### Two-Year Diploma Program (Full-time)

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 2000.

### Program Length

Two years, full-time beginning in September 1998, alternating on even number years.

### Tuition Fees 1999/2000 (subject to change)

\$4676.60 for the two-year program.

### Books and Supplies 1999/2000

First-year: \$1060; Second-year: \$995 (general estimated cost and subject to change).

### Entrance Requirements

High school graduation. English 12. Math 12. Physics 11. 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.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

### Expenses

Students are also responsible for costs of travel to and from agencies where practical 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 Content — 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	Technical 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)	hrs/wk	credits
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)	hrs/wk	credits
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

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 1402	Professional Ethics	3.0	3.0
PROR 4330	Practicum (4 weeks)	35.0	9.5
PROR 4400	Prosthetics and Orthotics 4	14.0	15.0
PROR 4410	Patient Assessment and Care	3.0	3.0
PROR 4420	Case Studies	5.0	5.5

### Faculty and Staff

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## Specialty Nursing

### Bachelor of Technology (Part-time)

#### Introduction

The Bachelor of Technology in Specialty Nursing is the only program in British Columbia designed to prepare registered nurses for employment in specialty nursing practice.

These specialties include:

- Critical Care
- Emergency
- Neonatal
- Nephrology
- Occupational Health
- Pediatrics
- Perinatal

Learners in the Bachelor of Technology in Specialty Nursing program are experienced nurses who are either seeking employment or are employed in one of the nursing specialties listed above. The program combines part-time distance study with practice based clinical education. Credit for previous experience and education is granted through a variety of transfer credit and course challenge procedures.

The curriculum for the Bachelor of Technology in Specialty Nursing has been developed through the collaborative efforts of the BCIT Specialty Nursing faculty, nursing curriculum consultants, employers, learners, practicing nurses and clients. The curriculum focuses on the technology of specialized nursing practice. Technology is broadly conceptualized as the knowledge, skills and attitudes that specialty nurses require in order to practice.

The curriculum also focuses on building partnerships. Both nursing and learning are viewed as relational endeavors in which communication and collaboration enhance the processes and outcomes of these endeavours. Partnership, therefore, is the context in which specialty knowledge, skills and attitudes are learned and enacted.

The faculty are experienced clinical specialists, academically prepared as educators, who maintain their competency by regular clinical practice. They demonstrate their commitment to the profession and to practice-based education by active involvement in professional organizations and interest groups.

### Graduate Characteristics

The Bachelor of Technology in Specialty Nursing program provides a broad range of perspectives, specialized knowledge and skills. The intent is to build on learners' previous experience and education in order to prepare learners to competently care for individuals, groups and communities.

**Competence in specialty nursing practice will be facilitated by the following graduate characteristics:**

- Development of **reflective, critical thinking** skills
- Participation in **collaborative** relationships
- Further development of verbal and written **communication** skills
- Development of **systematic inquiry** as a basis of practice
- Expansion of **professionalism** through caring for and about individuals, groups and communities
- Engagement in personal and professional **growth**

#### Flexible Learning Options

Learners may take all theory courses on a part-time basis via distance education modes. Selected courses may be offered on site. Methods of delivery include print based material, audio and video conferencing, computer mediated communications, and classroom formats. There are three terms per year, each 12 weeks in length: Winter, Jan to March; Spring, April to June; Fall, September to December. *Registration should occur at least one month prior to the term start date.*

**Clinical courses** are offered full-time or part-time at various appropriate clinical sites throughout the province of B.C. Clinical placements outside of B.C. may be negotiated individually.

### Entrance Requirements

- Proof of active, or eligibility for, practicing RNABC registration
- English 12 or equivalent
- Two years of current and relevant work experience

*continued next page*

## Specialty Nursing cont.

### Registration Procedures

Individuals interested in applying for entry into the Bachelor of Technology in Specialty Nursing program should complete a BCIT Bachelor of Technology Application Form and send it to the BCIT Admissions department.

### Previous Learning

Learners with previous Specialty Nursing course work and two years of relevant work experience will be assessed on an individual basis by the program faculty.

- Learners with previous BCIT course work will have this work assessed for potential credit into the degree program.
- Transfer of credit for non BCIT Specialty courses may be granted.
- Transfer of credit for Liberal Education course will be assessed by the Registrar's office.

Original, sealed transcripts and course outlines are required to assess for transfer of credit.

### Program Information

For more detailed information, please call the Specialty Nursing Advisor at 1-800-663-6542 or 1-604-451-7100.

### Program Structure

1. Advanced Technical Component	48.0 credits
a. Advanced Specialty Certificate	33.0*
b. Core/Management Courses	15.0
* Except the Nephrology option (see below)	
2. Liberal Education Component	12.0 credits
<b>Total</b>	<b>60.0 credits</b>

### Program Content

#### 1. Advanced Technical Component

##### A. Advanced Specialty Certificate (33.0 credits)

Students choose one area and complete the requirements within that specialty area to qualify for an Advanced Specialty Certificate.

a) Critical Care			credits
BUSA	7250	Management Skills/Applications	3.0
NSCC	7100	Introduction to Critical Care Nursing	3.0
NSSC	7115	Client Education	3.0
NSCC	7200	Critical Care Nursing Theory 1	4.0
NSCC	7300	Critical Care Nursing Clinical 1	3.0
NSCC	7400	Critical Care Nursing Theory 2	5.0
NSCC	7500	Critical Care Nursing Clinical 2	5.0
NSCC	7600	Care of Patients with a Complex Critical Illness	4.0
Program Head Approved Elective			3.0
<b>Total</b>			<b>33.0</b>

b) Emergency			credits
BUSA	7250	Management Skills/Applications	3.0
NSER	7100	Intro to Emergency Nursing Theory 1	3.0
NSSC	7115	Client Education	3.0
NSER	7200	Emergency Nursing Theory 2	4.0
NSER	7300	Emergency Nursing Clinical 1	5.0
NSER	7400	Emergency Nursing Theory 3	4.0
NSER	7500	Emergency Nursing Clinical 2	5.0
NSER	7600	Emergency Nursing Preceptorships	3.0
Program Head Approved Elective			3.0
<b>Total</b>			<b>33.0</b>

c) Nephrology			credits
BUSA	7250	Management Skills/Applications	3.0
NSSC	7115	Client Education	3.0
NSNN	7200	Nephrology Theory 1	3.0
NSNN	7300	Nephrology Clinical 1	2.0
NSNN	7400	Nephrology Theory 2	3.0
NSNN	7500	Nephrology Clinical 2	5.0
NSNN	7600	Nephrology Theory 3	3.0
NSNN	7700	Nephrology Clinical 3	5.0
Program Head Approved Electives			6.0
<b>Total</b>			<b>33.0</b>

d) Neonatal			credits
BUSA	7250	Management Skills/Applications	3.0
NSNE	7100	Neonatal Theory 1	3.0
NSSC	7115	Client Education	3.0
NSNE	7200	Neonatal Theory 2	3.0
NSNE	7300	Neonatal Clinical 1	4.0
NSNE	7400	Neonatal Theory 3	4.0
NSNE	7500	Neonatal Clinical 2	4.0

Plus an additional 3.0 credits selected from the list below

NSNE	7900	Neonatal Preceptorship	
NSNE	7930	Indep Study in Neonatal Nursing	
NSNE	7940	Adv Concepts in Neonatal Nurs (proposed) and/or Program Head Approved Electives	3.0
<b>Total</b>			<b>27.0</b>

## Specialty Nursing cont.

e) Occupational Health			credits
BUSA	7250	Management Skills/Applications	3.0
NSSC	7115	Client Education	3.0
NSOH	7100	Introduction to Occupational Health	3.0
NSOH	7200	Work and Work Environment 1	3.0
NSOH	7250	Work and Work Environment 2	3.0
NSOH	7300	Occupational Health Nursing Clinical 1	4.0
NSOH	7400	Occupational Health Assessments	3.0
NSOH	7450	Occupational Health Surveillance	3.0
NSOH	7500	Occupational Health Nursing Clinical 2	4.0
NSOH	7600	Occupational Health Program Planning	4.0
<b>Total</b>			<b>33.0</b>

f) Pediatric			credits
BUSA	7250	Management Skills/Applications	3.0
NSSC	7115	Client Education	3.0
NSPE	7100	Pediatric Theory 1	3.0

One of the following two courses:

NSPE	7200	Pediatric Theory 2: Acute Illness, or	
NSPE	7210	Pediatric Theory 2: Critical Care	3.0
NSPE	7300	Pediatric Clinical 1	4.0
NSPE	7400	Pediatric Theory 3	4.0
NSPE	7500	Pediatric Clinical 2	4.0

Plus an additional 9.0 credits selected from the list below

NSPE	7900	Pediatric Preceptorship	
NSPE	7910	Pediatric Nursing in the Home	
NSPE	7920	Pediatric Arrest Management	
NSPE	7930	Indep Study in Pediatric Nursing	
NSPE	7940	Adv Concepts in Pediatric Nurs (proposed) and/or Program Head Approved Electives	9.0
<b>Total</b>			<b>33.0</b>

g) Perinatal			credits
BUSA	7250	Management Skills/Applications	3.0
NSSC	7115	Client Education	3.0
NSPN	7100	Perinatal Theory 1	3.0
NSPN	7200	Perinatal Theory 2	3.0
NSPN	7300	Perinatal Clinical 1	6.0
NSPN	7400	Perinatal Theory 3	4.0
NSPN	7500	Perinatal Clinical 2	5.0
		Program Head Approved Elective	6.0
<b>Total</b>			<b>33.0</b>

h) Perioperative			credits
BUSA	7250	Management Skills/Applications	3.0
NSSC	7115	Client Education	3.0
NSPO	7100	Perioperative Theory 1	3.0
NSPO	7200	Perioperative Theory 2	4.0
NSPO	7300	Perioperative Clinical 1	5.0
NSPO	7400	Perioperative Theory 3	2.0
NSPO	7500	Perioperative Clinical 2	5.0
NSPO	7600	Perioperative Theory 4	3.0
NSPO	7700	Perioperative Clinical 3	5.0
<b>Total</b>			<b>33.0</b>

### B. Core/Management Courses (15.0 credits)

All three courses must be completed by all students

NSSC	8000	Systematic Inquiry	3.0
NSSC	8300	Creative Leadership	3.0
NSSC	8500	Professional Growth	3.0

These two courses must be completed by all students except Nephrology, Occupational Health and Perioperative students.

NSSC	8600	Special Nursing Practice/Communities	3.0
NSSC	8800	Communities Health Issues/Action	3.0

#### Nephrology students complete:

NSSC	8600	Special Nursing Practice/Communities	3.0
NSSC	8800	Communities Health Issues/Action	3.0

Plus an additional 6.0 credits selected from the list below

NSNE	7900	Neonatal Preceptorship	
NSNE	7930	Indep Study in Neonatal Nursing	
NSNE	7940	Adv Concepts in Neonatal Nurs (proposed) and/or Program Head Approved Electives	

#### Occupational Health students complete:

NSOH	8800	OH/ Creating the Future	6.0
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#### Perioperative students complete:

NSPO	8800	Expanded Peri Practice Clinical Study; or both of	6.0
NSSC	8600	Special Nursing Practice/Communities	3.0
NSSC	8800	Communities Health Issues/Action	3.0

### 2. Liberal Education (12.0 credits)

Students are required to complete 12.0 credits in this area. Please contact the Registrars Office, Bachelor of Technology department for further information at (604) 432-8230.

### RNABC Registration

As well as providing this information at the time of admission, students are also required to provide proof of RNABC membership in the year they apply for graduation from the degree program.

For more information on Bachelor of Technology programs offered at BCIT please refer to page 53 of this Calendar.



# Manufacturing & Industrial Mechanical

*“The ELTT program provides applicants with job-ready skills which result in productivity from the first day they enter our workforce. The theoretical knowledge gained at BCIT prepares them for the continuation of studies on the path to trade certification. ELTT graduates are well versed in the safety aspects of the trade and quickly grasp our behavior-based safety philosophy. We are very receptive to ELTT graduates and we look forward to the continued support from BCIT and our consideration for employment of many more of their graduates for years to come.”*

*~ Vic Smith, Group Manager,  
Department of National Defence*



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## Manufacturing and Industrial Mechanical Programs

### Manufacturing

#### Bachelor of Technology (Part-time)

The Bachelor of Technology in Manufacturing program is a career-enhancement degree designed for graduate engineers and technologists to provide them the necessary skills and knowledge for advanced technology in manufacturing.

The Bachelor of Technology in Manufacturing degree is a flexible program that allows a student to study in several of the following areas:

- Manufacturing Management
- Automation and Robotics
- Manufacturing Processes
- Design for Manufacture
- Materials
- Product Development
- Operations Management
- Information Technology
- Quality Assurance and Control

This part-time studies program is scheduled to serve the needs of working professionals. Classes are held in the evenings or weekends. The program allows students to specialize in one area of study or take courses from a variety of areas.

#### Entrance Requirements

1. A diploma in a manufacturing-related technology such as Plastics, Robotics and Automation or Mechanical Technology with a minimum course average of 65 per cent or the equivalent level of formal training/education at the post-secondary level.
2. At least two years of appropriate work experience.
3. English 12 or equivalent.
4. Interview

### Registration Procedure

Individuals interested in applying for entry into the Bachelor of Technology in Manufacturing should complete a BCIT Bachelor of Technology Application form and send it, along with official transcript, resume and application fee to the BCIT Admissions department, 3700 Willingdon Avenue, Burnaby, B.C., V5G 3H2.

An interview with the program coordinator is required to have the proposed Program of Study form for Technical Coursework approved. The applicant may alternatively request an informal interview with the program coordinator prior to sending in the application. Contact the program administrative assistant at (604) 432-8274 to arrange for an interview.

Candidates may select and register for courses after reviewing each terms course offerings in the BCIT Part-time Studies flyer. Candidates should be aware that they may complete only 6 credits of Technical Component course work prior to acceptance into the degree program. Candidates are expected to complete at least three courses per year.

A selection of courses will be provided for applicants who require some technical upgrading to allow them to bridge into this program. Course prescribed for bridging will be based on an individual assessment. These courses will not be credited towards the degree.

#### Program Length

As a part-time studies program a period of three to five years may be required to complete the program. However, the degree must be completed within six years from acceptance into the program.

Prior to acceptance into the program, candidates may complete:

- a maximum of 6 credits of Technical Studies/ Management course work; and
- a maximum of 12 credits of Liberal Education Component course work.

#### Program Structure

The general requirement for a Bachelor of Technology in Manufacturing degree program is a minimum of 60 credits from four components. Candidates will follow their individually approved educational plan.

Components	Credits
1. Technology Studies Section	24.0
- Common Core Courses	15.0
- Major Elective Studies Courses	9.0
2. Management Section	9.0
3. Graduation Project	15.0
4. Liberal Education Section	12.0



## Manufacturing cont.

### 1. Technology Studies Section

**Common Core Courses** (15 credits/ all courses must be completed)

FMGT	7221	Manufacturing Cost Accounting	3.0
MTEC	7017	Inspection Methods for Quality Control	3.0
MTEC	7045	Industrial Design Process	3.0
MTEC	7052	Manufacturing Control Systems	3.0
OPMT	7023	Materials Logistics	3.0

**Major Elective Studies Courses** (9 credits required):

#### Automation and Control

MTEC	7051	Introduction to Machine Vision	3.0
MTEC	8051	Applications in Machine Vision	3.0
MTEC	8050	Manufacturing Automation Systems	3.0

#### Manufacturing Engineering Technology

MTEC	7000	Parametric Modeling	3.0
MTEC	7040	Introduction to FEM	3.0
MTEC	7041	Plastics Processes and Materials	3.0
MTEC	7042	Plastic Product Design	3.0
MTEC	7047	Advanced Engineering Materials	3.0
MTEC	7065	Manufacturing Processes for Wood Products	3.0
MTEC	8012	Advanced CAM Applications	3.0
MTEC	8015	Fixture and Tool Design	3.0
MTEC	8045	Design for Manufacture and Assembly	3.0
MTEC	8055	Computer Aided Process Planning	3.0

#### Manufacturing Management

OPMT	7021	Quality Assurance	3.0
OPMT	7026	Manufacturing Information Systems	3.0
OPMT	8021	Design of Experiments	3.0
OPMT	8015	Manufacturing Facility Layout & Analysis	3.0

### 2. Management Studies Section (9.0 credits required)

**Management Common Core Courses** (5 credits/ all courses required)

BUSA	7250	Management Skills and Applications	3.0
TMGT	7122	Accounting for Technologists	1.0
TMGT	7144	Human Resource Planning and Control	1.0

**Elective Studies Courses** (4 credits required)

TMGT	7101	Engineering, Technology and Management	1.0
TMGT	7102	Project Management in High Technology	1.0
TMGT	7104	The Management of Technological Change	1.0
TMGT	7121	Principles of Finance	1.0
TMGT	7123	Technology Information Systems	1.0
TMGT	7124	Technology and International Finance	1.0
TMGT	7141	Managing in a Technical Environment	1.0
TMGT	7142	Technology Management Communication	1.0
TMGT	7143	Problem Solving and Decision Making	1.0
HRMG	3205	Labour Relations I	3.0

### 3. Graduation Project Section (15.0 credits)

Each degree program student, after completing the prescribed course work, will have to complete an industry-sponsored project in their selected area.

MTEC	7090	Research Methods	3.0
MTEC	7092	Degree Project Planning and Management	3.0
MTEC	8090	Mechanical Degree Project	9.0

### 4. Liberal Education Studies Section (12 credits)

Students must complete 12.0 credits of Liberal Education. For further information please contact the Registrars Office at (604) 432-8230.

## CAD Programming

### One-Year Post-diploma Program (Full-time)

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 available as a one-year, full-time program.

### Job Opportunities

Graduates of the program work in a diverse area of engineering including drafting/designing, CAD system management, software development and system automation. Students have started their own consulting and service companies or have moved into technical sales and training.

### Entrance Requirements

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.

Students should have a basic knowledge of personal computers, 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.

*continued next page*

## CAD Programming cont.

### Tuition Fees 1999/2000 (subject to change)

\$2338.30 for the one-year, full-time program.

### Books and Supplies 1999/2000

\$780 (general estimated cost and subject to change).

### Program Content — CAD Programming

#### Level 1 (September - December) (15 weeks)

			hrs/wk	credits
AICO	1070	Introduction to UNIX*	3.0	2.0
CDCM	2370	Technical Programming I	4.0	4.0
CDCM	2372	Database Applications	3.0	3.0
CDCM	3375	CAD Customization I	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)

			hrs/wk	credits
AICO	2070	Introduction to UNIX		
		Shell Script Programming *	3.0	2.0
CDCM	3470	Technical Programming 2*	4.0	3.0
CDCM	3472	CAD/Database Applications *	3.0	2.0
CDCM	4470	Technical Programming 3*	4.0	3.0
CDCM	4475	CAD Customization 2*	3.0	2.0
CDCM	4600	Advanced CAD Graphics	4.0	5.5
CDCM	4671	CAD Programming*	3.0	2.0
CDCM	4690	Post Diploma Project	5.0	6.5
CDCM	5660	Graphic System Management*	3.0	2.0
CDCM	6660	Graphics Information Management*	3.0	2.0
COMP	3765	Issues in Networking*	3.0	2.0
COMP	4575	Graphics Programming*	2.0	3.0

\*denotes half-term courses

## Mechanical Engineering Technology

### Two-Year Diploma Program (Full-time)

The Mechanical Engineering Technology program is a program accredited by the Applied Science Technologists and Technicians of British Columbia. It 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 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.

### Tuition Fees 1999/2000 (subject to change)

\$4676.60 for the two-year program.

### Books and Supplies 1999/2000

First year: \$1420; Second year: \$1000 (general estimated cost and subject to change).

### Entrance Requirements

**First year applicants:** High school graduation. English 12. Math 12. Physics 11. Minimum (C) letter grade preferred. Completion of related Technology Education courses a definite asset.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

### Engineering Technology Entry (ETE)

This full-time day school program provides academic upgrading to students wishing to enrol in engineering-based technology programs at BCIT.

For information about the ETE program, please refer to page 51 of this Calendar.

### Technology Entry with English Language Training Program (TEWELT)

This program is offered through Academic Studies and runs concurrently with the ETE January intake. Computer literacy, math and physics lectures are common courses with ETE, but TEWELT has its own extended communication course which focuses on skills needed by students who require English language training. For more information about the TEWELT program please refer to page 52 of this calendar.

**Second-year applicants:** 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. Applicants must meet BCIT English Language requirements (English 12).

## Mechanical Engineering Technology cont.

### 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 Bachelor of Technology in Manufacturing degree program.

### Bachelor of Technology

BCIT is now offering several Bachelor of Technology programs enabling graduates to complete their degrees on a part-time basis.

### The Programs

Following the completion of the common first-year, students will select one of the following areas of specialization:

#### CAD/CAM option

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.

### Mechanical Design option

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, material science, instrumentation and controls, CAD (Computer Aided Design) and CAE (Computer Aided Engineering) software packages. With the broad base of knowledge obtained, a graduate can design or improve existing design of products or systems. Design offers an exciting and rewarding career providing the satisfaction of seeing a newly developed product from conception to production.

#### Job Opportunities

A mechanical design technologist has diverse employment opportunities in industries such 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 draftsman, 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 Option

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, and so on. The duties of a manufacturing technologist include production planning, tool and/or product design, process automation, cost estimating and manufacturing management.

### Mechanical Systems Option

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.

*continued next page*

## Mechanical Engineering Technology cont.

### 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.

### Program Content — Mechanical Engineering Technology

#### Common First-year Courses

Level 1	(15 weeks)	hrs/wk	credits
CHSC 1105	Engineering Materials I	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 I	3.0	3.0
MECH 1105	CAD Graphics	4.0	4.0
MECH 1141	Engineering Mechanics I	5.0	5.0
MECH 1171	Computer Applications and Programming	4.0	4.0

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 1220	Energy Systems	3.0	4.0
MECH 2201	Engineering Graphics 2	5.0	6.5
MECH 2240	Strength of Materials	4.0	6.0
MECH 2241	Engineering Mechanics 2	3.0	4.0
PHYS 2149	Physics for Mechanical	4.0	5.5

### CAD/CAM Option

#### Second-year Courses

Level 3	(15 weeks)	hrs/wk	credits
CDCM 2370	Technical Programming I	4.0	4.0
CDCM 2372	Database Applications	3.0	3.0
CDCM 3305	CAD Graphics 3	3.0	3.0
CDCM 3375	CAD Customization I	4.0	4.0
MANU 3318	CNC Programming	5.0	5.0
MATH 3491	Numerical Methods	4.0	4.0
MECH 3340	Machine Design I	4.0	4.0
MECH 3345	Computer Aided Engineering	4.0	4.0

Level 4	(20 weeks)	hrs/wk	credits
CDCM 3460	CAD/CAM System Management	3.0	4.0
CDCM 3470	Technical Programming 2*	4.0	2.5
CDCM 3472	CAD/Database Applications *	3.0	2.5
CDCM 4405	CAD Graphics 4	4.0	5.5
CDCM 4470	Technical Programming 3*	4.0	3.0
CDCM 4475	CAD Customization 2*	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

### Design Option

#### Second-year Courses

Level 3	(15 weeks)	hrs/wk	credits
ELEX 2840	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 I	3.0	3.0
MECH 3320	Thermal Engineering I	4.0	4.0
MECH 3325	Fluid Mechanics	4.0	4.0
MECH 3340	Machine Design I	4.0	4.0
MECH 3345	Computer Aided Engineering	4.0	4.0

Level 4	(20 weeks)	hrs/wk	credits
COMM 2449	Technical Communication	4.0	5.5
ELEX 2835	Instrumentation for Mechanical	4.0	5.5
MECH 3445	Theory of Mechanisms*	4.0	2.5
MECH 3451	Fluid Power 2*	4.0	2.5
MECH 3452	Fluid Power 3*	4.0	2.5
MECH 3460	Engineering Economics*	3.0	2.0
MECH 4421	Thermal Engineering 2*	4.0	2.5
MECH 4440	Machine Design 2	5.0	6.5
MECH 4450	Mechanical Control Systems*	4.0	2.5
MECH 4491	Design Projects*	5.0	3.5
MECH 4495	Engineering Design*	4.0	2.5

\* denotes half term course

### Manufacturing Option

#### Second-year Courses

Level 3	(15 weeks)	hrs/wk	credits
ELEX 2845	Electrical Equipment	4.0	4.0
MANU 3310	Material Removal Processes	5.0	5.0
MANU 3312	Computer Aided Manufacturing	5.0	5.0
MANU 3314	Tool Design	4.0	4.0
MANU 3316	Advanced Materials	4.0	4.0
MECH 2350	Fluid Power I	3.0	3.0
OPMT 1411	Production Management	5.0	5.0

## Mechanical Engineering Technology cont.

Level 4	(20 weeks)	hrs/wk	credits
COMM 2449	Technical Communication	4.0	5.5
MANU 4410	Material Joining Processes *	4.0	2.5
MANU 4412	Production Planning*	4.0	2.5
MANU 4450	Automated Manufacturing*	4.0	2.5
MANU 4490	Manufacturing Projects	3.0	4.0
MATH 4491	Statistical Quality Control	4.0	5.5
MECH 3440	Mechanical Equipment*	4.0	2.5
MECH 3451	Fluid Power 2	4.0	2.5
MECH 4450	Mechanical Control Systems	4.0	2.5
MANU 3410	Metrology	4.0	5.5
OPMT 1182	Total Quality Management	5.0	5.0

### Mechanical Systems Option

#### Second-year Courses

Level 3	(15 weeks)	hrs/wk	credits
ELEX 2845	Electrical Equipment	4.0	4.0
MATH 3492	Statistics	3.0	2.0
MECH 3320	Thermal Engineering I	4.0	4.0
MECH 3325	Fluid Mechanics	4.0	4.0
MSYS 2380	Building Construction	4.0	4.0
MSYS 3382	HVAC Load Analysis	5.0	5.0
MSYS 3386	Heating Systems	6.0	6.0

Level 4	(20 weeks)	hrs/wk	credits
COMM 2449	Technical Communication	4.0	5.5
MECH 3440	Mechanical Equipment*	4.0	2.5
MECH 3460	Engineering Economics *	3.0	2.0
MSYS 3389	Plumbing Systems*	3.0	4.0
MSYS 4410	Mechanical Systems Seminars*	2.0	1.5
MSYS 4450	Instrumentation and Control	5.0	3.5
MSYS 4470	Project Management	4.0	4.0
MSYS 4480	Air Conditioning Systems	6.0	8.0
MSYS 4486	Energy Management*	4.0	2.5
MSYS 4488	Fire Protection Systems*	4.0	3.0
MSYS 4490	Systems Projects	4.0	5.5

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## Plastics Technology

### Two-Year Diploma Program (Full-time)

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.

### 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 as well as 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 required for completion and certification.

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Manufacturing &  
Industrial Mechanical

## Plastics Technology cont.

### 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 positions are assumed quite rapidly.

### Program Length

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

### Tuition Fees 1999/2000 (subject to change)

\$4676.60 for the two-year program.

### Books and Supplies 1999/2000

First year: \$900; Second year: \$674 (general estimated cost and subject to change).

### Accreditation

This program is recognized 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.

### Entrance Requirements

High school graduation. English 12. Math 12. Physics 11 or Chemistry 11. Completion of both Physics and Chemistry is recommended. In addition, good communication skills, being able to work effectively with people and enjoying the challenge of applying ideas to practical situations is considered a definite asset.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

### Engineering Technology Entry (ETE)

This full-time day school program provides academic upgrading to students wishing to enrol in engineering-based technology programs at BCIT.

For information about the ETE program, please refer to page 51 of this Calendar.

## Technology Entry with English Language Training Program (TEWELT)

This program is offered through Academic Studies and runs concurrently with the ETE January intake. Computer literacy, math and physics lectures are common courses with ETE, but TEWELT has its own extended communication course which focuses on skills needed by students who require English language training. For more information about the TEWELT program please refer to page 52 of this calendar.

### Program Content — 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 1104	Computer Aid Design	4.0	4.0
MECH 1141	Engineering Mechanics I	5.0	5.0
MECH 1171	Computer Applications and Programming	4.0	4.0
PLAS 1110	Plastics Technology I	4.0	4.0

Level 2	(20 weeks)	hrs/wk	credits
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 2204	Technical Graphics for Plastics	4.0	3.0
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 2845	Electrical Equipment	4.0	4.0
MECH 2350	Fluid Power I	3.0	3.0
OPMT 1411	Total Quality Management*	5.0	5.0
PLAS 3310	Plastics Technology 3	7.0	7.0
PLAS 3340	Plastics Design	2.0	2.0
PLAS 3320	Fibre Reinforced Plastics	5.0	5.0

Level 4	(20 weeks)	hrs/wk	credits
COMM 2462	Technical Communication for Plastics	4.0	5.5
MECH 3440	Mechanical Equipment*	4.0	2.5
MATH 4491	Statistical Quality Control	4.0	5.5
MECH 3451	Fluid Power 2*	4.0	2.5
MECH 3460	Engineering Economics *	3.0	2.0
MECH 4450	Mechanical Control Systems*	4.0	2.5
OPMT 1182	Total Quality Management	4.0	5.5
PLAS 4410	Plastics Technology 4	6.0	8.0
PLAS 4490	Plastics Project	6.0	5.5
PLAS 3445	Injection Molding Analysis	2.0	3.0

\*denotes half-term course.

## Plastics Technology cont.

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## Robotics and Automation

### Two-Year Diploma Program (Full-time)

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.

### The Program

The Robotics and Automation program consists of four terms. Students are admitted into the first level in September only.

### Job Opportunities

Graduates of the Robotics and Automation Technology find employment in industries using 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.

### Program Length

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

### Tuition Fees 1999/2000 (subject to change)

\$4676.60 for the two-year program.

### Books and Supplies 1999/2000

First year: \$1435; Second year: \$1630 (general estimated cost and subject to change).

### 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.

### Entrance Requirements

High school graduation. English 12. Math 12(C+) and Physics 11(C+) or Physics 12(C). Preference may be given to those candidates who have completed the entrance requirements within the last three years.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

### Engineering Technology Entry (ETE)

This full-time day school program provides academic upgrading to students wishing to enrol in engineering-based technology programs at BCIT.

For information about the ETE program, please refer to page 51 of this Calendar.

### Technology Entry with English Language Training Program (TEWELT)

This program is offered through Academic Studies and runs concurrently with the ETE January intake. Computer literacy, math and physics lectures are common courses with ETE, but TEWELT has its own extended communication course which focuses on skills needed by students who require English language training. For more information about the TEWELT program please refer to page 52 of this calendar.

Manufacturing &  
Industrial Mechanical

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## Robotics and Automation cont.

### Program Content

The program is in a process of "continuous improvement," thus the actual courses may vary from those shown.

### Program — Robotics and Automation

#### Level 1 (September - December) 15 weeks

			hrs/wk	credits
COMM	1164	Technical Writing for Robotics	3.0	3.0
ELEX	1205	DC Circuits for Robotics	6.0	6.0
ELEX	1215	Digital Techniques I for Robotics	6.0	6.0
MATH	1342	Technical Math for Robotics	6.0	6.0
MECH	1104	Computer Aided Design	4.0	4.0
PHYS	1164	Physics for Robotics I	5.0	5.0

#### Level 2 (January - May) 20 weeks

			hrs/wk	credits
ELEX	2205	AC Circuits for Robotics	5.0	6.5
ELEX	2220	Digital and Electronic Circuits	6.0	8.0
MATH	2342	Calculus for Robotics	6.0	8.0
MECH	1210	Manufacturing Processes	4.0	5.5
PHYS	2164	Applied Physics 2 for Robotics	5.0	6.5
ROBT	1270	"C" Programming	5.0	6.5

#### Level 3 (September - December)

			hrs/wk	credits
ELEX	3321	Electronics Circuits 2 (Robotics)	6.0	6.0
MATH	3342	Transform Calculus (Robotics)	4.0	4.0
MECH	2350	Fluid Power I	3.0	3.0
ROBT	3341	Robot Applications	6.0	6.0
ROBT	3351	Automation Equipment	5.0	5.0
ROBT	3356	Controller Systems	6.0	6.0

#### Level 4 (January - May)

			hrs/wk	credits
COMM	2464	Technical Writing 2 for ROBT	3.0	4.0
ELEX	4336	Feedback Systems	6.0	8.0
MECH	3451	Fluid Power 2*	4.0	2.5
MECH	3452	Fluid Power 3*	4.0	2.5
OPMT	1184	Industrial Engineering ROBT	4.0	5.5
ROBT	3416	Computer Integrated Manufacturing for Robotics*	4.0	2.5
ROBT	4451	Sensor Interfacing	6.0	8.0
ROBT	4455	PLC Applications for Robotics*	4.0	2.5
ROBT	4491	Robotics Project	4.0	5.5

\* denotes a half-term course

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## Technology Teacher Education

### Two-Year Diploma Program (Full-time) One-Year Certificate Program (Full-time)

This program is currently under review and is being restructured at this time. Changes to the profile of the program may occur after publishing this information.

The Technology Teacher Education program for technical teachers is an affiliated cooperative program between BCIT and UBC that has three components.

### Technological Component

Completion of a Diploma of Technology Teacher Education at BCIT.

### Academic Component

Completion of 30 credits of university transfer liberal arts and science courses including six credits of English.

### Pedagogical Component

Completion of professional teacher education studies at UBC.

When all three of the above program components have been completed a Bachelor of Education Degree is awarded by UBC. B.Ed. degree holders qualify for a B.C. Professional Teaching Certificate.

### Job Opportunities

Technical studies in schools is now focusing on Technology Education in grades K - 12. In most School Districts Technology Education has absorbed or replaced Industrial Education. The resulting new focus has broadened the range of technologies being studied using a practical (hands-on) student centred approach. Employment opportunity for recently trained male and female technology teachers is extremely good at all grade levels as well as for several high school Career Preparation options. Technology Teacher Education may also lead to careers in post-secondary training, industry training or other occupations that require technical generalists.

### Technological Component

#### Diploma

The format for high school graduates having technical aptitude and capability but hold a technical credential. This option spans two years, of two terms each, beginning in September and concluding in May each year.

#### Certificate

The format for applicants having either a relevant technical degree, Diploma of Technology (Eng), Trade Qualification or equivalent. It is anticipated that applicants will receive transfer or credit exemption for relevant previous technical education and will normally complete their program in a summer term, two regular terms (Sept-May) and a final summer term. A Personal Education Plan will be developed in consultation with each candidate.



## Program Completion

Normally the Academic Component requirements will be completed before candidates begin the Technological Component at BCIT. However, applicants may apply to complete the Academic Component after they complete the Technical Component at BCIT.

## Tuition Fees 1999/2000 (subject to change)

\$4676.60 for the two-year program.  
\$2338.30 for the accelerated program.

## Books and Supplies 1999/2000

First year: \$1660; Second year: \$955  
Accelerated Program \$1865  
(general estimated cost and subject to change).

## Entrance Requirements

### Diploma

High school graduation. English 12, Math 11. Any of the following science courses: Physics 11, Chemistry 11, Biology 11. Additionally, applicants must upon request be prepared to submit an illustrated portfolio demonstrating their technical aptitude/capability.

### Certificate

High school graduation. English 12, Math 11. Additionally, applicants must have technical/technology capability relation to B.C. School's Technology curriculum indicated by one of the following:

- Technical Degree (Engineering)
- Technology Diploma (Engineering)
- Trades Certification (Trades Qualification or Inter-Provincial)

Significant technological on the job learning which can be substantiated by technical letters of reference and performance records.

For both the above options, preference may be given to applicants having:

- (C+) or better grades
- completed senior secondary or post-secondary Math and Science Physics, Chemistry, Biology courses
- completed Industrial/Technology Education courses
- completed all or majority of university transfer liberal arts and science courses
- completed secondary or post-secondary computer applications courses in fundamental computer literacy (able to word process, create, store and transfer files).

All applicants must submit the following three Confidential Letters of Reference: (Confidential Letters of Reference are to include the referee's phone number, be signed by the referee and submitted in an envelope with the referee's signature across the sealed flap):

- a character reference letter supporting suitability for teaching
- a technical reference letter supporting technical capability
- a reference letter outlining capability of working with children

All applicants must submit a resume with their application.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

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## Engineering Technology Entry (ETE)

This full-time day school program provides academic upgrading to students wishing to enrol in engineering-based technology programs at BCIT.

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## Technology Entry with English Language Training Program (TEWELT)

This program is offered through Academic Studies and runs concurrently with the ETE January intake. Computer literacy, math and physics lectures are common courses with ETE, but TEWELT has its own extended communication course which focuses on skills needed by students who require English language training. For more information about the TEWELT program please refer to page 52 of this calendar.

## Program Content —

### Technology Teacher Education Diploma

#### Level 1 (September - December) (15 weeks)

			hrs/wk	credits
TTED	3100	Teaching Design Drawing and CAD I	6.0	6.0
TTED	3110	Teaching Precision Measurement	1.0	1.0
TTED	3120	Teaching Product Manufacturing I	6.0	16.0
TTED	3140	Materials in Technology Ed I	4.0	4.0
TTED	3170	Using Computers in Teaching I	3.0	3.0

continued next page

## Technology Teacher Education cont.

Level 2 (January - May) (20 weeks)			hrs/wk	credits
TTED	4200	Teaching Design Drawing and CAD 2	6.0	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)

			hrs/wk	credits
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	5371	Using Computers in Teaching 3	2.0	2.0
TTED	5390	Introduction to Technology Education	4.0	4.0

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	6480	Technical Projects for Technology Education	4.0	5.5
TTED	6490	Technology Education Applications	4.0	5.5

### Program Content — Technology Teacher Education Certificate

#### 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 1	6.0	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 & 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

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TBA, Ministry of Education

## Wood Products Manufacturing

### Two-Year Diploma Program (Full-time)

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.

## Wood Products Manufacturing cont.

### The Program

First-year students in the Wood Products Manufacturing 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 an 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.

### Tuition Fees 1999/2000 (subject to change)

\$4676.60 for the two-year program.

### Books and Supplies 1999/2000

First year: \$775; Second year: \$770 (general estimated cost and subject to change).

### Entrance Requirements

High school graduation. English 12. Math 12. Any science course at the grade 11 level.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

### Engineering Technology Entry (ETE)

This full-time day school program provides academic upgrading to students wishing to enrol in engineering-based technology programs at BCIT.

For information about the ETE program, please refer to page 51 of this Calendar.

## Technology Entry with English Language Training Program (TEWELT)

This program is offered through Academic Studies and runs concurrently with the ETE January intake. Computer literacy, math and physics lectures are common courses with ETE, but TEWELT has its own extended communication course which focuses on skills needed by students who require English language training. For more information about the TEWELT program please refer to page 52 of this calendar.

### Program Content —

#### 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	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)	hrs/wk	credits
COMM 2235	Technical Communication 2	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 per cent 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

continued next page

## Wood Products Manufacturing cont.

Level 4	(20 weeks)	hrs/wk	credits
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

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B. Strongitharm, Primex Forest Products Ltd.

## Heating, Ventilating, Air Conditioning and Refrigeration Technician (HVAC&R)

### Two-Year Cooperative Trades Training Diploma Program (Full-time)

#### Job Opportunities

The Heating, Ventilation, Air Conditioning and Refrigeration Technician (HVAC&R) program will produce competent entry-level tradespersons who are highly knowledgeable in all aspects of the HVAC and 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 and R controls, or may find positions in building maintenance.

### The Program

The Heating, Ventilation, Air Conditioning and Refrigeration (HVAC and 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.

### Grading

Course passing grade is 64 per cent. In order to successfully complete each level a minimum grade point average of 70 per cent is required. An overall GPA of 70 per cent is required to successfully complete the program.

### 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 difficult 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 visit our cooperative training section on the web. 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 at the Burnaby campus.

### Program Length

Full-time, 85 weeks, consisting of one 20-week term and two, 10-week school terms, combined with two co-op work terms: co-op work term one is 23 weeks, and co-op work term two is 22 weeks.

### Normal Course Hours

0830-1400, Monday through Friday.

### Tuition Fees 1999/2000 (subject to change)

\$2126 for the 85-week program.

### Books and Supplies 1999/2000

\$1003 (general estimated cost and subject to change).

## Entrance Requirements

High school graduation. English 12 or Communications 12. Academic Math 11 (C). BCIT pretest is acceptable for English and Math. Applicants must pass a BCIT Mechanical Reasoning test. Applicants must also attend a personal interview to determine their suitability for the program. An interview is granted only after academic requirements have been met.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

## Fresh Start

This full-time technical literacy program provides academic upgrading in an applied setting for students wishing to enter a trades/technical program at BCIT.

For information about the Fresh Start program, please refer to page 51 of this calendar.

## Trades Discovery for Women

This full-time program is designed to prepare participants to successfully enter and complete a Trades Training program.

For information about the Trades Discovery for Women program, please refer to page 52 of this Calendar.

## Program Content — Heating, Ventilation, Air Conditioning and Refrigeration Technician (HVAC&R)

Level I		Hours
HVAC 1095	Apply Effective Learning Techniques	6
HVAC 1100	Apply Trade Safety Practices	30
HVAC 1101	Process Technical Information	40
HVAC 1103	Apply Trade Tools and Fasteners	60
HVAC 1104	Apply Fundamentals of Refrigeration	130
HVAC 1105	Proper Service Procedures	82
HVAC 1106	Apply Electrical Fundamentals	82
HVAC 1107	Interpret Electrical Diagrams	44
HVAC 1108	Apply Electrical Test Equipment	30
HVAC 1109	Install Electrical Devices	60
HVAC 1111	Install Refrigeration Project	30
HVAC 1112	Prepare for Employment	6
HVAC 1990	Co-op I	690
<b>Total</b>		<b>1290</b>

Level 2		Hours
HVAC 2110	Design Refrigeration Systems	48
HVAC 2111	Ammonia Systems Water Treatment	42
HVAC 2112	Describe Basic HVAC Systems	30
HVAC 2113	Air Distrib Arrangement for HVAC	30
HVAC 2114	Air Properties and Measurement	34
HVAC 2115	Explain HBAC Control Loops	56
HVAC 2116	Maintain Heat Pump Systems	60
HVAC 2990	Co-op 2	660
<b>Total</b>		<b>1260</b>

Level 3		Hours
HVAC 3101	Comm HVAC Heat/Cool Load Calc	33
HVAC 3101	Service Gas Heating Systems	120
HVAC 3102	Design HVAC Distribution System	27
HVAC 3103	Maintain Computer Environ Syst	90
HVAC 3104	Explain Heat Recovery/Energy Mgt	30
<b>Total</b>		<b>300</b>

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Peter Masztalar, Fraser Valley Refrigeration  
Mark Porter, Airstream Heating & AC  
Dave Serguis, Polar Industries  
Art Sutherland, Accent Refrigeration Systems  
Robert Wilkinson, Chill Air

## Refrigeration Mechanic

### Certificate Program (Full-time)

A refrigeration mechanic's 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 the daily routine.

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## Refrigeration Mechanic cont.

### 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.

### 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.

### Grading

Minimum course passing grade is 64 per cent. In order to successfully complete the program an overall GPA of 70 per cent or better is required.

### Program Length

Full-time, 25 weeks.

### Normal Course Hours

0800-1430, Monday through Friday.

### Tuition Fees 1999/2000 (subject to change)

\$908.75 for the 25-week program.

### Books and Supplies 1999/2000

\$675 (general estimated cost and subject to change).

### Entrance Requirements

High school graduation. English 12 or Communications 12. Academic Math 11 (C). BCIT pretest is acceptable for English and Math. Applicants must also pass the BCIT Mechanical Reasoning test.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

### Fresh Start

This full-time technical literacy program provides academic upgrading in an applied setting for students wishing to enter a trades/technical program at BCIT.

For information about the Fresh Start program, please refer to page 51 of this calendar.

## Trades Discovery for Women

This full-time program is designed to prepare participants to successfully enter and complete a Trades Training program.

For information about the Trades Discovery for Women program, please refer to page 52 of this Calendar.

### Program Content — Refrigeration Mechanic

Courses	Hours
RFMX 1100 Apply Effective Learning Techniques	14
RFMX 1102 Apply Trade Safety Practices	36
RFMX 1104 Process Technical Information	60
RFMX 1106 Perform High Temperature Welding	30
RFMX 1108 Apply Trade Tools and Fasteners	60
RFMX 1110 Apply Fundamentals of Refrigeration	160
RFMX 1112 Perform Proper Service Procedures	120
RFMX 1114 Apply Electrical Fundamentals	90
RFMX 1116 Interpret Electrical Diagrams	60
RFMX 1118 Apply Electrical Test Equipment	60
RFMX 1120 Install Electrical/Mechanical Equipment	60
<b>Total</b>	<b>750</b>

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## Industrial Maintenance Programs

### Industrial Maintenance Mechanic

#### Two-Year Cooperative Trades Training Diploma Program (Full-time)

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.

## Grading

Course passing grade is 64 per cent. In order to successfully complete the program an overall grade point average of 70 per cent or better is required.

## 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 difficult 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 visit our cooperative training section on the Internet.

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

Full-time, 80 weeks, consisting of three 16-week academic terms combined with two co-op work terms: of 16 weeks each.

## Normal Course Hours

0730-1400, Monday through Friday (possibly 1230-1900 in welding and machine shop).

## Tuition Fees 1999/2000 (subject to change)

\$2199.20 for the 80-week program.

## Books and Supplies 1999/2000

\$891 (general estimated cost and subject to change).

## Entrance Requirements

High school graduation. English 12 or Communications 12. Any Math course at the Grade 11 level. BCIT pretest is acceptable for English and Math, or individual assessment by the department. An interview is required and will be granted after the academic requirements have been met. Good physical condition is desirable. Potential students with medical or physical difficulties should contact the Educational Resource

Centre for Students with Disabilities to arrange an interview with the Institute's Rehabilitation Specialist at (604) 451-6963. Ask for a telephone interview if you are from out of town.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

## Fresh Start

This full-time technical literacy program provides academic upgrading in an applied setting for students wishing to enter a trades/technical program at BCIT.

For information about the Fresh Start program, please refer to page 51 of this calendar.

## Trades Discovery for Women

This full-time program is designed to prepare participants to successfully enter and complete a Trades Training program.

For information about the Trades Discovery for Women program, please refer to page 52 of this Calendar.

## Program Content — Industrial Maintenance Mechanic

Level 1	Hours
IMMX 1100 Mechanics 1	180
IMMX 1101 Machining 1	150
IMMX 1102 Welding	60
IMMX 1103 Steel Fabrication	90
Sub Total	480
IMMX 1990 Co-op 1	480
<b>Total</b>	<b>960</b>
Level 2	Hours
IMMX 2100 Mechanics 2	120
IMMX 2101 Machining 2	120
IMMX 2102 Computers in Industry 1	120
IMMX 2103 Electrical	120
Sub Total	480
IMMX 2990 Co-op 2	480
<b>Total</b>	<b>960</b>
Level 3	Hours
IMMX 3100 Mechanics 3	150
IMMX 3101 Machining 3	150
IMMX 3102 Computers in Industry 2	30
IMMX 3103 Maintenance Methods/Systems	60
IMMX 3104 Maintenance Project	90
<b>Total</b>	<b>480</b>
<b>Overall Total</b>	<b>2400</b>

continued next page

## Industrial Maintenance Mechanic cont.

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## Millwright ELTT

### Certificate Program (Full-time)

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 the Educational Resource Centre for Students with Disabilities to arrange an interview (telephone interview if out of town) with the Institute's Rehabilitation Specialist, (604) 451-6963.

### Grading

Minimum course passing grade is 80 per cent.

### Program Length

Full-time, 39 weeks.

### Normal Course Hours

0730-1400, Monday through Friday.

### Tuition Fees 1999/2000 (subject to change)

\$1400.85 for the 39-week program.

### Books and Supplies 1999/2000

\$745 (general estimated cost and subject to change).

## Entrance Requirement

High school graduation. English 12 or Communications 12. Any Math course at the grade 11 level. BCIT pretest is acceptable for English and Math.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

### Fresh Start

This full-time technical literacy program provides academic upgrading in an applied setting for students wishing to enter a trades/technical program at BCIT.

For information about the Fresh Start program, please refer to page 51 of this calendar.

### Trades Discovery for Women

This full-time program is designed to prepare participants to successfully enter and complete a Trades Training program.

For information about the Trades Discovery for Women program, please refer to page 52 of this Calendar.

## Program Content — Millwright ELTT

Courses	Hours
MILL 1100 Use Safe Work Practices	36
MILL 1101 Process Technical Information	42
MILL 1102 Solve Mathematical Problems	48
MILL 1103 Apply Physics Concepts	36
MILL 1104 Identify Common Materials	30
MILL 1105 Sketch and Read Drawings	36
MILL 1106 Measure Layout and Hand Tools	30
MILL 1107 Use Fastenings and Fittings	48
MILL 1108 Use Support Machines	120
MILL 1109 Use Shafts Hubs and Keys	24
MILL 1110 Use Bearings	36
MILL 1111 Use Seals and Packing	18
MILL 1112 Use Lubrication	30
MILL 1113 Use Power Drives	30
MILL 1114 Millwright Shop Equipment	72
MILL 1115 Perform Fitting and Assembly	24
MILL 1116 Rigging Ladders and Scaffolds	42
MILL 1117 Describe Fluid Power	150
MILL 1118 Identify Pneumatic Systems	36
MILL 1119 Material Handling Systems	24
MILL 1120 Perform Welding and Cutting	90
MILL 1121 Machinery Install/Alignment	54
MILL 1122 Use Machine Shop Equipment	72
MILL 1123 Prepare for Employment	12
MILL 1124 Electrical Circuits	30
<b>Total</b>	<b>1170</b>

*They ask for our grads by name*



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## Machinist Programs

### Machinist ELTT

#### Certificate Program (Full-time)

The machinist makes or repairs metal and plastic parts, tools and machines, including custom work on one-off items and operating semi-automatic equipment on production runs. General machinists use lathes, drill presses, milling machines and grinders to shape the material to size. 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. Opportunities also exist in industrial sales.

#### 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 the Educational Resource Centre for Students with Disabilities to arrange an interview (telephone interview if out of town) with the Institute's Rehabilitation Specialist, (604) 451-6963.

#### Grading

Individual course passing grade is 64 per cent. Students must achieve an overall grade point average of 70 per cent to successfully complete the program.

#### Normal Program Length

Full-time, 38 weeks.

#### Course Hours

0700-1400 (first shift) or 1230-1915 (second shift), Monday through Friday.

## Tuition Fees 1999/2000 (subject to change)

\$1365.70 for the 38-week full-time program.

## Books and Supplies 1999/2000

\$742 (general estimated cost and subject to change).

## Entrance Requirements

High school graduation. English 12 or Communications 12. Any Math course at the grade 11 level. BCIT pretest is acceptable for English and Math.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

## Fresh Start

This full-time technical literacy program provides academic upgrading in an applied setting for students wishing to enter a trades/technical program at BCIT.

For information about the Fresh Start program, please refer to page 51 of this calendar.

## Trades Discovery for Women

This full-time program is designed to prepare participants to successfully enter and complete a Trades Training program.

For information about the Trades Discovery for Women program, please refer to page 52 of this Calendar.

## Program Content — Machinist ELTT

Courses	Hours
MACH 1100 Apply Safe Work Practices	25
MACH 1101 Solve Math Problems Machinery	90
MACH 1102 Shop Drawings	45
MACH 1103 Layout Measure/Test Tools/Equip	90
MACH 1104 Use Support Machines	115
MACH 1106 Use Lathes	200
MACH 1108 Vertical/Horizontal Milling	170
MACH 1110 Use Precision Grinders	45
MACH 1111 Oxyacetylene Cut and Weld	15
MACH 1112 Fit Bearings Seals Gaskets	60
MACH 1113 Select Lubricants for Application	15
MACH 1115 Prepare for Employment	20
MACH 1116 Complete Machine Shop Projects	90
MACH 1124 Fundamentals of NC and CNC	120
MACH 1129 Basic Metallurgy	40
ZAPR 0000 Apprenticeship Year 1 Exam	0
<b>Total</b>	<b>1140</b>

## Machinist/CNC

### Two-Year Cooperative Trades Training Diploma Program (Full-time)

#### Job Opportunities

Graduates of the two-year Machinist/CNC Machinist Co-op program seek employment as apprentice machinists or entry-level workers in a shop using computer numerical control (CNC) equipment.

#### The Program

The Machinist/CNC Machinist Coop program provides training in basic machining skills as well as basic CNC machining skills. The program content is very similar to the Machinist ELTT and the CNC Machinist Operator programs with the inclusion of an opportunity to practice skills during co-op work terms.

#### Grading

Individual course passing grade is 64 per cent. Students must achieve an overall grade point average of 70 per cent to successfully complete the program.

#### 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 difficult 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 visit our cooperative training section on the web. 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 at the Burnaby campus.

#### Program Length

Full-time, 100 weeks

Level 1 - 40 weeks (20 weeks in school, 20 weeks co-op)

Level 2 - 40 weeks (20 weeks in school, 20 weeks co-op)

Level 3 - 20 weeks (in school)

#### Normal Course Hours

0700-1400, Monday through Friday.

#### Tuition Fees 1999/2000 (subject to change)

Level 1: \$1043    Level 2: \$1043    Level 3: \$703

#### Books and Supplies 1999/2000

\$850 (general estimate, subject to change).

#### Entrance Requirements

High school graduation. English 12 or Communications 12. Any Math course at the Grade 11 level. BCIT pretest is acceptable for English and Math. Interview for ALL applicants is required prior to program entry. An Interview is only granted after academic requirements have been met.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

#### Fresh Start

This full-time technical literacy program provides academic upgrading in an applied setting for students wishing to enter a trades/technical program at BCIT.

For information about the Fresh Start program, please refer to page 51 of this calendar.

#### Trades Discovery for Women

This full-time program is designed to prepare participants to successfully enter and complete a Trades Training program.

For information about the Trades Discovery for Women program, please refer to page 52 of this Calendar.

#### Program Content — Machinist/CNC

##### Level 1 (20 wks school and 20 wks co-op)

			hrs/wk	credits
MACH	1000	Apply Safe Working Practices	30	2.0
MACH	1005	Solve Math Problems I	30	2.0
MACH	1010	Read/Interpret Shop Drawings	30	2.0
MACH	1015	Layout, Measuring/Testing Tolls	60	4.0
MACH	1020	Support Machines	90	6.0
MACH	1025	Use Lathes	130	8.5
MACH	1030	Vertical/Horizontal Milling Machines	105	7.0
MACH	1035	Basic Metallurgy	25	1.5
MACH	1040	Select Lubricants for Spec Applic	10	0.5
MACH	1045	Describe Fundmtls of CNC	30	2.0
MACH	1050	Machine Shop Project	60	4.0
MACH	1990	Co-op I	0	20.0

**Level 2 (20 weeks school and 20 weeks co-op)**

			hrs/wk	credits
MACH	2005	Solve Math Problems 2	25	2.0
MACH	2015	Layout/Measurement & Testing Tools 2	20	1.0
MACH	2025	Use Lathes 2	105	7
MACH	2030	Use Precision Grinders	60	4.0
MACH	2035	Fit Bearings, Seals, Gaskets, and Packings	15	1.0
MACH	2050	Machine Shop Projects 2	60	4.0
MACH	2150	Fundamental of Computer Control	15	1.0
MACH	2155	Programming Fundamentals	45	3.0
MACH	2160	Machine Set up	45	3.0
MACH	2165	Tools Radius Compensation	15	1.0
MACH	2170	Programming CNC Lathes	90	6.0
MACH	2175	Programming CNC Machining	90	6.0
ZAPR	0000	Apprenticeship Year 1 Exam		0.0
ZAPR	0002	Apprenticeship Year 2 Exam		0.0
<b>Total</b>				<b>1200</b>

			hrs/wk	credits
<b>Level 3 (20 weeks)</b>				
MACH	3170	Programming CNC Lathes 2	240	16.0
MACH	3175	Programming CNC Machining Centres	240	16.0
MACH	3180	Programming with CAD/CAM	60	4.0
MACH	3185	Coordinate Measuring Machine	60	4.0

## Computer Numerical Control (CNC) Operator

**Associate Certificate Program (Full-time)**

This program trains students to operate CNC machines. Training is designed for machinists and other trades-persons who wish to upgrade their skills in the operation, IG coding and conventional programming of CNC equipment.

**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 Length**

20 weeks.

**Normal Course Hours**

1800-2200, Monday through Thursday.

**Tuition Fees 1999/2000 (subject to change)**

\$438 for the 20-week program.

**Books and Supplies 1999/2000**

\$100 (general estimated cost and subject to change).

**Entrance Requirements**

High school graduation. English 12 or Communications 12. Any Math course at the grade 11 level. BCIT pretest is acceptable for English and Math. Applicants must have completed third year Machinist apprentice level or undergo department review.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school Counsellor or BCIT Registration & Information at (604) 434-1610.

**Fresh Start**

This full-time technical literacy program provides academic upgrading in an applied setting for students wishing to enter a trades/technical program at BCIT.

For information about the Fresh Start program, please refer to page 51 of this calendar.

**Trades Discovery for Women**

This full-time program is designed to prepare participants to successfully enter and complete a Trades Training program.

For information about the Trades Discovery for Women program, please refer to page 52 of this Calendar.

### Program Content — Computer Numerical Control (CNC) Operator (Program currently under review; course curriculum subject to change)

			hrs
MACH	2100	Apply Safe Work Practices	10.0
MACH	2101	Trade Related Mathematics	20.0
MACH	2102	Introduction to Computers	20.0
MACH	2104	Use CNC Turning Centres	110.0
MACH	2106	Use CNC Machinist Centres	160.0

## Computer Numerical Control (CNC) Operator cont.

### Faculty and Staff

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Terry Wadd, Machinist T.Q., Mach-Fitter

### Machinist Advisory Committee Members

Tony Berry, Nicholson Manufacturing Ltd.  
Jonni Fox, Sharp-Rite Technologies Ltd.  
Joel Lafleur, NCCO Manufacturing  
Surinder Lubana, Creo Products Inc.  
Michel Maillochon, Ebro Aerospace  
Bob McDiarmid, CAE Machinery  
Rob Strell, Raute-Wood Industries Ltd.  
Rob Vanderstarren, Pazmac Enterprises  
Walter Voros, Teleflex (Canada) Ltd.  
Guy Walton, Creo Products Inc.

## Tool and Die Technician

### Two-Year Cooperative Diploma Program (Full-time)

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 Tool and Die Technician program provides a foundation of tool-making and plastic mold-making skills. This two-year program combines an on-the-job component to support institutional instruction. The first year is devoted to the design and making of jigs and fixtures and the making of metal forming dies and punches. The second year includes progression die design and building. The final portion of the program is dedicated to designing and building plastic molds.

### 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 difficult 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 visit our cooperative training section on the web. 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 at the Burnaby campus.

### Grading

Individual course passing grade is 64 per cent, students must achieve an overall grade point average of 70 per cent for successful completion of the program.

### Program Length

Full-time, 100 weeks.  
Level 1-40 weeks (20 weeks in school, 20 weeks co-op)  
Level 2-40 weeks (20 weeks in school, 20 weeks co-op)  
Level 3-20 weeks (in school)

### Normal Course Hours

0700-1400, Monday through Friday.

### Tuition Fees 1999/2000 (subject to change)

Level 1 - \$1023      Level 2 - \$1023      Level 3 - \$703

### Books and Supplies 1999/2000

Level 1 - \$446      Level 2 - \$179      Level 3 - \$68  
(general estimated cost and subject to change)

## Entrance Requirement

High school graduation. English 12 or Communications 12. Academic Math 12 (P). BCIT pretest is acceptable for English and Math. A successful interview by the department is required only after all academic requirements have been met.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

## Fresh Start

This full-time technical literacy program provides academic upgrading in an applied setting for students wishing to enter a trades/technical program at BCIT.

For information about the Fresh Start program, please refer to page 51 of this calendar.

## Trades Discovery for Women

This full-time program is designed to prepare participants to successfully enter and complete a Trades Training program.

For information about the Trades Discovery for Women program, please refer to page 52 of this Calendar.

## Program Content — Tool and Die Technician

Level I	Description	Hours
TOOL 1100	Tool and Die I - Theory	15
	Tool and Die I - Practical	216
TOOL 1101	Blueprint Reading	30
TOOL 1102	Precision Measurement I Theory	15
	Precision Measurement I - Practical	5
TOOL 1103	Mathematics I	30
TOOL 1104	Technical Communications I	24
TOOL 1105	CNC I - Theory	22.5
	CNC I - Practical	37.5
TOOL 1106	Metallurgy I - Theory	15
	Metallurgy I - Practical	5
TOOL 1107	Mechanics - Theory	15
	Mechanics - Practical	15
TOOL 1990	Co-op I	600
<b>Total</b>		<b>1200</b>

Level 2	Description	Hours
TOOL 2850	Tool and Die 2 - Theory	120
	Tool and Die 2 - Practical	180
TOOL 2851	Drafting	30
TOOL 2852	Precision Measurement 2 - Theory	15
TOOL 2853	Mathematics 2	30
TOOL 2854	Mechanics 2 - Theory	15
	Mechanics 2 - Practical	15
TOOL 2855	Tool Design I	60
TOOL 2856	CNC 2 - Theory	22.5
	CNC 2 - Practical	37.5
TOOL 2857	Elect Discharge Mach I - Theory	15
	Elect Discharge Mach I - Practical	15
TOOL 2858	Materials/Manufacturing Processes	30
TOOL 2990	Co-op 2	600
<b>Total</b>		<b>1200</b>

Level 3	Description	Hours
TOOL 3300	Tool and Die 3 - Theory	135.0
	Tool and Die 3 - Practical	195.0
TOOL 3301	Materials and Processes	30.0
TOOL 3302	Technical Communications 2	30.0
TOOL 3303	Mechanics 3	30.0
TOOL 3304	Tool Design 2	60.0
TOOL 3305	CNC 3 - Theory	22.5
	CNC 3 - Practical	37.5
TOOL 3306	Elect Discharge Mach 2 - Theory	22.5
	Elect Discharge Mach 2 - Practical	37.5
<b>Total</b>		<b>600</b>

## Faculty and Staff

Trevor Williams, B.Sc., M.Sc. (Mech Eng.), PEng., Dean  
twilliam@bcit.bc.ca  
Kate Pelletier, B.Ed. MRE, Associate Dean, kpelletier@bcit.bc.ca  
Tony Hurley, I.D., Machinist T.Q., Instrument Maker

## Power Engineering Programs

Power Engineers operate, maintain and manage industrial power and process plants. These plants are associated with various industries such as pulp and paper, chemical manufacturing, food processing, electrical generation, petroleum refining, institutional mechanical systems and others. Provincial Acts require that plant personnel be certified prior to assuming positions of responsibility in the operation of fired pressure equipment.

Certificates range from the entry-level of Fourth Class to the highest level of First Class. Basically, the larger the plant, the higher the level of certificate required to operate and manage the facility.

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## Power Engineering Programs cont.

A First Class Power Engineer's Certificate entitles the holder to be in charge of a plant of unlimited size. A combination of theoretical study and practical plant experience is required to qualify to write each level of certificate examination.

There are three entry-level programs offered at BCIT. The Power Engineering General program prepares participants for entry into industry with a Fourth Class Power Engineer's Certificate.

The Power Engineer Technical program is similar to the General program but in addition provides participants with a higher level of mathematics, physics and electricity to meet the prerequisites for entry into the Power and Process Engineering program.

The Power and Process program prepares participants for entry into industry with a Third Class Power Engineer's Certificate. In addition, graduates of this program are brought to a high knowledge level in the subjects of math, physics and electricity, providing an easier progression to higher levels of certification as a Power Engineer.

Graduates of the Power and Process Engineering program may be exempted by the B.C. Regulations from 50 per cent of the on-the-job qualifying experience required between the Third and the Second Class Certificate examinations.

## Power Engineering General Program

### Certificate Program (Full-time)

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 examinations for an Interprovincial 4th Class Power Engineer's Certificate of Competency.

### Job Opportunities

Former graduates have secured employment in hospitals, chemical plants, oil refineries, breweries, pulp and paper plants, sawmills, schools and institutions. Average salaries reported by students were among the highest when compared to other occupational programs.

Graduates of this program may be able to obtain employment as 4th Class Power Engineers in industry, and qualify for positions as plant operators and maintenance technicians.

## 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 plant systems. Power plant tours, extensive workshop and power plant laboratory experience are provided to reinforce theoretical concepts, develop manual skills and familiarity with power engineering techniques.

Applicants should have a good command of oral and written English; sufficient physical strength and stamina to meet the demands of the work; good hearing, eyesight, normal color vision, manual dexterity and hand/eye coordination. In addition, applicants should have good theoretical and practical mathematical and mechanical aptitude. Previous power plant experience and related training are assets. Potential students with medical or physical difficulties should contact the Educational Resource Centre for Students with Disabilities to arrange an interview (telephone interview if out of town) with the Institute's Rehabilitation Specialist at (604) 451-6963.

### Grading

A minimum course passing grade is 60 per cent.

### Program Length

Full-time, 40 weeks.

### Normal Course Hours

0800-1500, Monday through Friday.

### Tuition Fees 1999/2000 (subject to change)

\$1406 for the 40-week program.

### Books and Supplies 1999/2000

\$756 (general estimated cost and subject to change).

### Entrance Requirement

High school graduation. English 12 or Communications 12. Any Math course at the grade 11 level. BCIT pretest is acceptable for English and Math.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

## Fresh Start

This full-time technical literacy program provides academic upgrading in an applied setting for students wishing to enter a trades/technical program at BCIT.

For information about the Fresh Start program, please refer to page 51 of this calendar.

## Trades Discovery for Women

This full-time program is designed to prepare participants to successfully enter and complete a Trades Training program.

For information about the Trades Discovery for Women program, please refer to page 52 of this Calendar.

## Program Content —

### Power Engineering General Program

Courses	Hours
POWR 1100 Power Plant Training 1	90
POWR 1101 Power Plant Oper and Systems 1	40
POWR 1102 Drafting	20
POWR 1103 Power Plant Theory 1	90
POWR 1104 General Electricity 1	60
POWR 1105 Power Plant Maintenance 1	90
POWR 1106 Instrumentation 1	60
POWR 1107 General Mathematics	150
POWR 2200 Power Plant Training 2	80
POWR 2201 Power Plant Oper and Systems 2	40
POWR 2203 Power Plant Theory 2	90
POWR 2204 General Electricity 2	60
POWR 2205 Power Plant Maintenance 2	90
POWR 2206 Instrumentation 2	60
POWR 2208 Heating/Ventilation/Air Cond	40
POWR 2209 Applied Science	100
POWR 2210 Business Writing	40
<b>Total</b>	<b>1200</b>

## Power Engineering Technical Program

### Certificate Program (Full-time)

**Note:** 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.

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.

After completing the program, graduates are prepared to write the B.C. Ministry of Municipal Affairs examinations for an Interprovincial 4th Class Power Engineer's Certificate of Competency.

## Job Opportunities

Former graduates have secured employment in hospitals, chemical plants, oil refineries, breweries, pulp and paper plants, sawmills, schools and institutions. Average salaries reported by students were among the highest when compared to other occupational programs.

Graduates may then be able to obtain employment as 4th Class Power Engineers in industry and be qualified for positions as operators and maintenance technicians.

## 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 plant systems. Power plant tours and extensive workshop and power plant laboratory experience are provided to reinforce theoretical concepts, develop manual skills, and a familiarity with power engineering techniques.

The Technical program differs from the General program in that it provides students with higher level studies in mathematics, physics and electricity to meet the prerequisites for the Power and Process program.

Applicants should have a good command of oral and written English; sufficient physical strength and stamina to meet the demands of the work; good hearing, eyesight, normal color vision, manual dexterity and hand/eye coordination. In addition, applicants should have excellent theoretical and practical mathematical and mechanical aptitude. Previous power plant experience and related training are assets. Potential students with medical or physical difficulties should contact the Educational Resource Centre for Students with Disabilities to arrange an interview (telephone interview if out of town) with the Institute's Rehabilitation Specialist at (604) 451-6963.

## Grading

A minimum course passing grade of 60 per cent.

## Program Length

Full-time, 40 weeks.

## Normal Course Hours

0800-1500, Monday through Friday.

## Tuition Fees 1999/2000 (Subject to Change)

\$1406 for the 40-week program.

## Books and Supplies 1999/2000

\$896 (general estimated cost and subject to change).

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## Power Engineering Technical Program cont.

### Entrance Requirements

High school graduation. English 12 or Communications 12. Academic Math 12. Physics 11. BCIT pretest is acceptable for English, Math and Physics.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

### Fresh Start

This full-time technical literacy program provides academic upgrading in an applied setting for students wishing to enter a trades/technical program at BCIT.

For information about the Fresh Start program, please refer to page 51 of this calendar.

### Trades Discovery for Women

This full-time program is designed to prepare participants to successfully enter and complete a Trades Training program.

For information about the Trades Discovery for Women program, please refer to page 52 of this Calendar.

### Program Content — Power Engineering Technical Program

Courses	Hours
POWR 1100 Power Plant Training 1	90
POWR 1101 Power Plant Oper and Systems 1	40
POWR 1102 Drafting	20
POWR 1103 Power Plant Theory 1	90
POWR 1105 Power Plant Maintenance 1	90
POWR 1106 Instrumentation 1	60
POWR 1120 Technical Electricity 1	60
POWR 1121 Technical Mathematics 1	90
POWR 1122 Applied Physics 1	60
POWR 2200 Power Plant Training 2	80
POWR 2201 Power Plant Oper and Systems 2	40
POWR 2203 Power Plant Theory 2	80
POWR 2205 Power Plant Maintenance 2	80
POWR 2206 Instrumentation 2	60
POWR 2211 Business Writing	40
POWR 2220 Technical Electricity 2	60
POWR 2221 Technical Mathematics 2	80
POWR 2222 Applied Physics 2	60
POWR 2223 Industrial Electronics	20
<b>Total</b>	<b>1200</b>

## Power and Process Engineering

### Diploma of Trades Training (Full-time)

**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.

This program provides sound practical and technical knowledge and skills to persons desiring advancement to the highest levels in the field of power engineering. After completing the program, graduates are prepared to write the B.C. Ministry of Municipal Affairs examinations for an interprovincial 3rd Class Power Engineer's Certificate of Competency.

### Job Opportunities

An analysis of five years of data shows that 80 per cent of Power and Process 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 have secured employment in hospitals, chemical plants, oil refineries, breweries, pulp and paper plants, sawmills, thermal power stations, schools and institutions and design offices.

Graduates of this program may be able to obtain employment as 3rd Class Power Engineers and be qualified for positions of considerable responsibility as plant operators, plant maintenance technicians, sales engineers and design technicians.

### 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, engineering practicums, workshops, power plant laboratory and troubleshooting exercises are provided to reinforce theoretical concepts, develop manual skills, and a familiarity with additional power engineer 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 and eyesight, normal color vision, manual dexterity and hand/eye coordination.

In addition, applicants should have excellent theoretical and practical mathematical and mechanical aptitude. Previous power plant experience and related training are assets. Potential students with medical or physical difficulties should contact the Educational Resource Centre for Students with Disabilities to arrange an interview (telephone interview if out of town) with the Institute's Rehabilitation Specialist at (604) 451-6963.



## Grading

A minimum course passing grade is 60 per cent.

## Program Length

Full-time, 40 weeks.

## Normal Course Hours

0800-1500, Monday through Friday.

## Tuition Fees 1999/2000 (subject to change)

\$1406 for the 40-week program.

## Books and Supplies 1999/2000

\$1403 (general estimated cost and subject to change)

## Entrance Requirements

- English 12 or Communications 12, plus
- A valid 4th Class Power Engineering Certificate; and
- Recent (within two years), successful completion of either the BCIT Power Engineering Technical program or the first year of a university engineering program, or
- 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.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

## Fresh Start

This full-time technical literacy program provides academic upgrading in an applied setting for students wishing to enter a trades/technical program at BCIT.

For information about the Fresh Start program, please refer to page 51 of this calendar.

## Trades Discovery for Women

This full-time program is designed to prepare participants to successfully enter and complete a Trades Training program.

For information about the Trades Discovery for Women program, please refer to page 52 of this Calendar.

## Program Content — Power and Process Engineering

Courses	Hours
POWR 3301 Technical Communication 1	30
POWR 3302 Thermal Engineering 1	120
POWR 3303 Power Plant Theory 3	80
POWR 3304 Fluid Mechanics	60
POWR 3305 Power Plant Maintenance 3	30
POWR 3306 Metallurgy	40
POWR 3307 Computer Technology 1	60
POWR 3308 Engineering Mechanics	90
POWR 3309 Engineering Practicum 1	30
POWR 3320 Technical Electricity 3	60
POWR 4401 Technical Communication 2	20
POWR 4402 Thermal Engineering 2	100
POWR 4403 Power Plant Theory 4	80
POWR 4404 Plant Management	40
POWR 4405 Power Plant Maintenance 4	30
POWR 4406 Strength of Materials	60
POWR 4407 Computer Technology 2	60
POWR 4408 Heating/Ventilation Systems	60
POWR 4409 Engineering Laboratory	60
POWR 4410 Engineering Practicum 2	30
POWR 4420 Technical Electricity 4	60
<b>Total</b>	<b>1200</b>

## Faculty and Staff

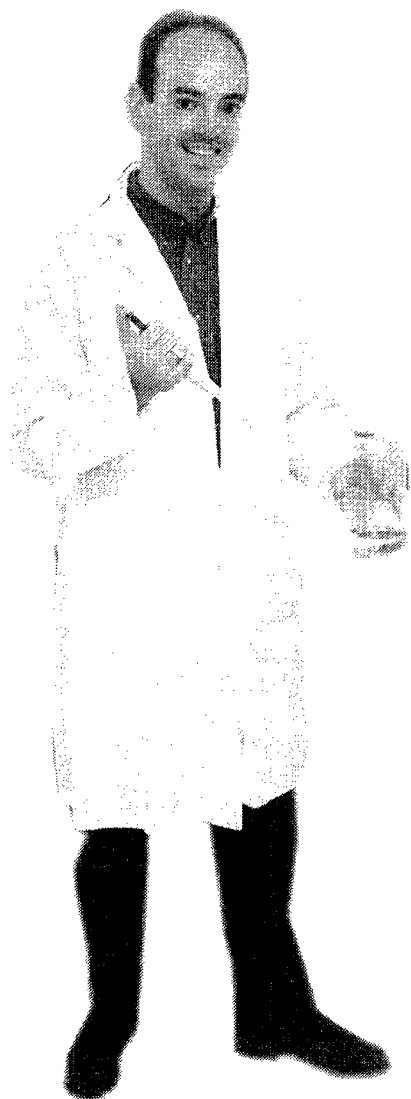
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## Advisory Committee Members

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# Processing, Energy & Natural Resources



*"While the education I received was excellent, it was the hands-on experience I gained that has been most valuable to my career. This experience helped me to be hired by Helix Biotech. BCIT has provided me with the tools to succeed and to progress in this company. I would recommend BCIT to anyone."*

*~ Robin Fotheringham, 1994  
Biological Sciences (Biotechnology)  
graduate and Laboratory Manager,  
Helix Biotech Labs*

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## Administration

Doug C. Deans, B.A., Dean  
Shameem Hameer, Administrative Assistant  
Terry Suen, Operations Manager  
Tracie Maryne, Clerical Support  
Joyce Muscroft, Secretary

## Biotechnology

### Two-Year Diploma Program (Full-time)

Biotechnology, an important and challenging new technology, makes use of such modern tools of biology as gene splicing, protein engineering and cell culture.

### The Program

Provides 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 BioPharma, 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.

### Tuition Fees 1999/2000 (subject to change)

\$4676.60 for the two-year program.

### Books and Supplies 1999/2000

First year: \$1035; Second year: \$703 (general estimated cost and subject to change).

### Degree Transfer/Completion

Simon Fraser University grants up to two years credit towards a Bachelor of Science in Biological Sciences to graduates of this program.

## Entrance Requirements

High school graduation. English 12(C+). Math 12(C). Biology 12(C). Chemistry 11(C). Physics 11(C).

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

## Engineering Technology Entry (ETE)

This full-time, day school program provides academic upgrading to students wishing to enrol in engineering-based technology programs at BCIT.

For information about the ETE program, please refer to page 51 of this Calendar.

## Technology Entry with English Language Training Program (TEWELT)

This program is offered through Academic Studies and runs concurrently with the ETE January intake. Computer literacy, math and physics lectures are common courses with ETE, but TEWELT has its own extended communication course which focuses on skills needed by students who require English language training. For more information about the TEWELT program please refer to page 52 of this calendar.

## Program Content — Biotechnology

Level 1	(15 weeks)	hrs/wk	credits
BIOT 1310	Introduction to Biotechnology	4.0	4.0
BIOT 1350	Biology I	4.0	4.0
BIOT 1370	Lab Safety	2.0	2.0
CHEM 1103	Applied Chemistry (inorganic)	6.0	6.0
COMM 1144	Communication I for Biot/Food	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)	hrs/wk	credits
BIOT 2301	Microbiology for Biotechnology I	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 Biot/Food	3.0	
MATH 2441	Statistics	5.0	6.5
PHYS 2141	Physics	5.0	6.5

Level 3	(15 weeks)	hrs/wk	credits
BIOT 3301	Microbiology for Biotechnology 2	6.0	6.0
BIOT 3320	Molecular Genetics I	6.0	6.0
BIOT 3330	Plant Cell Biology	6.0	6.0
BIOT 3340	Biochemistry I	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)	hrs/wk	credits
BIOT 4380	Internship Project	30.0	6.0

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P. Logan, BioLoma Consulting (Chair)  
T. McCurry, BC Biotechnology Alliance  
R. McMaster, UBC Medical Genetics  
C. Perez, Chromos Molecular Systems  
R. Schmid, Helix BioPharma  
H. Ziltener, UBC Biomedical Research Centre

## Chemical Sciences Technology

### Two-Year Diploma Program (Full-time)

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 emphasises 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 Chemistry:

Includes courses covering detailed topics in air, water and soil sampling and analysis, air pollution control, industrial wastewater treatment and remediation of contaminated sites.

#### Industrial Chemistry:

Emphasises mineral processing, ore processing, ore analysis, process dynamics and process measurement.

#### Pulp and 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. Enrolment into each second year option will be limited to 18 students.

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.

*continued next page*

## Chemical Sciences Technology cont.

### Program Length

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

### Tuition Fees 1999/2000 (subject to change)

\$4676.60 for the two-year program.

### Books and Supplies 1999/2000

First year: \$770; Second year: \$630 (general estimated cost and subject to change).

### Accreditation

The program is accredited by the Applied Science Technologists and Technicians of B.C.

### Entrance Requirements

High school graduation. English 12. Math 12. Chemistry 11. (Physics 11 and Chemistry 12 are strongly recommended).

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school Counsellor or BCIT Registration and Information at (604) 434-1610.

### Engineering Technology Entry (ETE)

This full-time, day school program provides academic upgrading to students wishing to enrol in engineering-based technology programs at BCIT.

For information about the ETE program, please refer to page 51 of this Calendar.

### Technology Entry with English Language Training Program (TEWELT)

This program is offered through Academic Studies and runs concurrently with the ETE January intake. Computer literacy, math and physics lectures are common courses with ETE, but TEWELT has its own extended communication course which focuses on skills needed by students who require English language training. For more information about the TEWELT program please refer to page 52 of this calendar.

## Program Content — Chemical Sciences Technology

Level 1	(15 weeks)	hrs/wk	credits
CHEM 1101	Chemistry I for Chemical Sciences	6.0	6.0
CHSC 1100	Computer Applications for Chemical Sciences	1.0	1.0
CHSC 1103	Engineering Materials I*	3.5	3.5
CHSC 1119	Environmental Science*	4.5	4.5
COMM 1135	Introduction to Technical Communication	3.0	3.0
MATH 1411	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 I	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*	3.5	4.5
CHSC 2248	Industrial Chemical Processes*	3.5	4.5
COMM 2235	Technical Communication 2	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 Chemistry

Level 3	(15 weeks)	hrs/wk	credits
CHEM 3309	Organic Chemistry I	6.0	6.0
CHEM 3310	Physical Chemistry	5.0	5.0
CHSC 3318	Chemical Analytical Techniques/Applications I	6.0	6.0
CHSC 3330	Pulp and Paper Process Control	2.0	2.0
CHSC 3341	Unit Operations I	6.0	6.0
MATH 3411	Numerical Methods for Chemical Sciences	5.0	5.0

Level 4	(20 weeks)	hrs/wk	credits
CHEM 4409	Organic Chemistry 2 for Chemical Sciences	6.0	8.0
CHEM 4414	Analytical Chemistry 2	6.0	8.0
CHEM 4416	Analytical Instrumentation	2.0	2.5
CHSC 3413	Environmental Analytical Methods	3.0	4.0
CHSC 3448	Industrial Chemistry	2.0	2.5
CHSC 4411	Pollution Science and Microbiology	6.0	8.0
CHSC 4412	Waste Management	3.0	4.0
CHSC 4420	Unit Project 2	3.0	4.0

### Option: Industrial Chemistry

Level 3	(15 weeks)	hrs/wk	credits
CHEM 3309	Organic Chemistry I	6.0	6.0
CHEM 3310	Physical Chemistry	5.0	5.0
CHSC 3318	Chemical Analytical Techniques/Applications I	6.0	6.0
CHSC 3314	Mineral Processing 1*	3.5	3.5
CHSC 3341	Unit Operations I	6.0	6.0
MATH 3411	Numerical Methods for Chemical Sciences	5.0	5.0

Level 4	(20 weeks)	hrs/wk	credits
CHEM 4409	Organic Chemistry 2 for Chemical Sciences	6.0	8.0
CHEM 4414	Analytical Chemistry 2	5.0	4.5
CHSC 3448	Industrial Chemistry	2.0	2.5
CHSC 4408	Ore Analysis	3.0	4.0
CHSC 4414	Mineral Processing 2	5.0	4.5
CHSC 4441	Unit Operations 2	6.0	8.0
ELEX 2830	Process Measurement	2.0	2.5

### Option: Pulp and Paper

Level 3	(15 weeks)	hrs/wks	credits
CHEM 3310	Physical Chemistry	5.0	5.0
CHSC 3318	Chemical Analytical Techniques/Applications I	6.0	6.0
CHSC 3330	Pulp & Paper Process Control	2.0	2.0
CHSC 3341	Unit Operations I	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)	hrs/wk	credits
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 alternate week labs.

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 P. Stoddart, Workers' Compensation Board  
 Chair Strang, Howe Sound Pulp and Paper Ltd.  
 J. A. McLeod, Cominca Ltd.  
 K. Rogers, Bondar Clegg, Incheape Intertek  
 Testing Sus. Services

## Fish, Wildlife and Recreation (Renewable Resources)

### Diploma Program

See Renewable Resources for program details.

## Food Technology

### Two-Year Diploma Program (Full-time)

### Job Opportunities

Graduates are employed by large companies such as Labatt, Molson, SunRype, and Dairyworld 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 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.

### Tuition Fees 1999/2000 (subject to change)

\$4676.60 for the two-year program.

### Books and Supplies 1999/2000

First year: \$1405; Second year: \$1235 (general estimated cost and subject to change).

continued next page

## Food Technology cont.

### 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.

### Entrance Requirements

High school graduation. English 12. Math 12. Chemistry 11.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

### Engineering Technology Entry (ETE)

This full-time, day school program provides academic upgrading to students wishing to enrol in engineering-based technology programs at BCIT.

For information about the ETE program, please refer to page 51 of this Calendar.

### Technology Entry with English Language Training Program (TEWELT)

This program is offered through Academic Studies and runs concurrently with the ETE January intake. Computer literacy, math and physics lectures are common courses with ETE, but TEWELT has its own extended communication course which focuses on skills needed by students who require English language training. For more information about the TEWELT program please refer to page 52 of this calendar.

### Program Content — Food Technology

\*Note: The Food Technology curriculum is currently under review. Courses offered may differ from the descriptions listed here.

Level I	(15 weeks)	hrs/wk	credits
BIOT 1020	Introductory Microbiology	6.0	6.0
CHEM 1103	Chemistry I for Biological Sciences	6.0	6.0
COMM 1144	Communication I for Biot/Food	3.0	3.0
FOOD 1030	Biology	5.0	5.0
FOOD 1090	Introduction to Food Technology	2.0	2.0
MATH 1441	Technical Mathematics for BioSciences	6.0	6.0
PHYS 1145	Physics I for Food Technology	3.0	3.0

Level 2	(20 weeks)	hrs/wk	credits
CHEM 2203	Chemistry 2 for Biological Sciences	6.0	8.0
COMM 2244	Communication 2 for Biot/Food	3.0	4.0
FOOD 2010	Food Processing I	6.0	8.0
FOOD 2020	Microbiology for Food Processing	6.0	8.0
MATH 2441	Statistics for Biological Sciences	5.0	6.5
PHYS 2145	Physics for Food Tech 2	4.0	5.5

Level 3	(15 weeks)	hrs/wk	credits
CHEM 3311	Instrumental Analytical Methods	5.0	5.0
FOOD 3010	Food Processing 2	5.0	5.0
FOOD 3030	Quality Control I	4.0	4.0
FOOD 3040	Food Analysis I	5.0	5.0
FOOD 3250	Sanitation for Food Processing	6.0	6.0
MATH 3441	Microcomputer Applications	3.0	3.0
OPMT 1343	Operations Management for Food Technology	3.0	3.0

Level 4	(20 weeks)	hrs/wk	credits
BUSA 1102	Management for Food Technology*	4.0	2.5
COMM 3444	Communication 3 for BIOT/FOOD*	4.0	2.5
ELEX 2825	Process Instrumentation for Food*	4.0	2.5
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)	4.0	5.0

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*Live simpler -  
consume less.*



## Food Technology cont.

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M. Howell, Dairyworld Foods  
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R. Prinz, B.C. Ministry of Agriculture, Fisheries and Food  
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P. Soo, Brew King  
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J. Vanderstoep, Food Science, UBC  
J. Wells, Western Basic Ingredients  
I. Woodrow, Corel Food Corp. (Chair)

## Forestry (Renewable Resources)

### Diploma Program

See Renewable Resources for program details.

## Geographic Information Systems

### Advanced Diploma Program (One-Year, Full-time or Part-time)

Geographic Information Systems (GIS) technology is used to manage and utilize 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 must possess good communication and technical problem-solving skills, a good disposition toward 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:

#### 50 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 (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.

### Tuition Fees 1999/2000 (subject to change)

\$1169.15 maximum per term.

### Books and Supplies 1999/2000

\$1060 (general estimated cost and subject to change).

### Program Content — GIS Foundation Technology (20 credits)

			hrs/wk	credits
CDCM	2270	Program Design in C	3.0	3.0
CDCM	2372	Database Applications	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 I	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.

*continued next page*

## Geographic Information Systems cont.

### 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

### Advanced Technology (12 credits)

	hrs/wk	credits
GIST 6101 Selected Topics in GIS*	4.0	3.0
GIST 6102 Customization and Modeling*	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:

	hrs/wk	credits
GIST 6110 Management Issues in GIS*	4.0	3.0

### Electives: (Suggested)

	hrs/wk	credits
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 (1 credits)

	hrs/wk	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

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B. Whitehead, MacMillan Bloedel

## Geomatics Technology (formerly Surveying)

### Two-Year Diploma Program (Full-time)

### One-Year Technician Program (Full-time)

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 Geomatics 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 Geomatics. Students in this program acquire a solid background in math, physics, cartography, photogrammetry, plane and geodetic surveying and computers. The practical skills of note keeping, drafting, field operations and calculations are also covered. Prospective students should have a genuine interest in mathematics, computers and earth sciences, and should enjoy a vigorous outdoor lifestyle.

Students desiring a less academic program may take advantage of the more field-oriented, technician-level program. Students who select this program will normally complete Level I of the general surveying program and then transfer into a specialized course of studies in applied survey techniques. The technician program will only be offered if sufficient students are available. Those students who can handle the math and physics courses should complete the first year of the Geomatics program. Courses in Geographic Information Systems are offered under the Part-time Studies program (see Part-time Studies Courses on-line at [www.bcit.bc.ca](http://www.bcit.bc.ca)), and as a post-diploma program in 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.

### Tuition Fees 1999/2000 (subject to change)

\$4676.60 for the two-year program.

### Books and Supplies 1999/2000

First year: \$1080; Second year: \$490 (general estimated cost and subject to change).

### 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.

### 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.

### Entrance Requirements

High school graduation. English 12. Math 12. Physics 11. Preference will be given to students achieving a grade of (C) or better in the entrance requirements. Applicants who have completed Earth Science 11 and Geology 12 are eligible to apply for course credit in BCIT course SURV 2263.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

### Engineering Technology Entry (ETE)

This full-time, day school program provides academic upgrading to students wishing to enrol in engineering-based technology programs at BCIT.

For information about the ETE program, please refer to page 51 of this Calendar.

### Technology Entry with English Language Training Program (TEWELT)

This program is offered through Academic Studies and runs concurrently with the ETE January intake. Computer literacy, math and physics lectures are common courses with ETE, but TEWELT has its own extended communication course which focuses on skills needed by students who require English language training. For more information about the TEWELT program please refer to page 52 of this calendar.

### Program Content — Geomatics

Level 1	(15 weeks)	hrs/wk	credits
COMM 1135	Introduction to Technical Communication	3.0	3.0
MATH 1511	Technical Mathematics for Geomatics	7.0	7.0
PHYS 1151	Physics for Surveying 1	5.0	5.0
SURV 1161	Surveying Computations 1	3.0	3.0
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)	hrs/wk	credits
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 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)	hrs/wk	credits
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 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)	hrs/wk	credits
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	3.0	3.0
SURV 3367	Photogrammetry 2	2.0	2.0
SURV 3372	Computer Applications 3	2.0	2.0
SURV 3378	Mining Surveying	2.0	2.0
SURV 3576	Global Positioning System	3.0	3.0

continued next page

## Geomatics Technology cont.

Level 4A	(10 weeks)	hrs/wk	credits
MATH 4511	Statistics for Surveying	6.0	4.0
SURV 4461	Surveying Computations 4	3.0	2.0
SURV 4462	Physical Geodesy	3.0	2.0
SURV 4464	Field Surveying 4	7.0	9.5
SURV 4465	Surveying CAD 3	3.0	4.0
SURV 4472	Engineering Surveying	2.0	1.5
SURV 4475	Introduction to Remote Sensing and Photo Interpretation	3.0	2.0
SURV 4663	Adjustment of Surveying Measurements	3.0	4.0

Level 4B	(10 weeks)	hrs/wk	credits
SURV 3369	Hydrographic Surveying	3.0	2.0
SURV 4464	Field Surveying 4	7.0	9.5
SURV 4465	Surveying CAD 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
SURV 4663	Adjustment of Surveying Measurements	3.0	4.0

### Program — Technician

(runs only if numbers warrant)

Level 1	(15 weeks)	hrs/wk	credits
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 I	3.0	3.0
SURV 1164	Field Surveying I	8.0	8.0
SURV 1165	Drafting and Cartography I	2.0	2.0
SURV 1172	Computer Applications I	2.0	2.0

Level 2	(20 weeks)	hrs/wk	credits
COMM 2251	Technical Communication	3.0	4.0
SURV 2260	Computational Methods for the Field Technician	5.0	6.5
SURV 2265	Surveying CAD I	2.0	2.5
SURV 2267	Photogrammetry I*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.

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## Mining

### Two-Year Diploma Program (Full-time)

### 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.

Strong industry support exists. 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.

## Mining cont.

### 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. An attendance record of at least 90 per cent is required of each student.

### A Work Study Education Program

A work study education program in partnership with the mining industry commenced in September 1996. For more information, please contact the Mining Technology department at (604) 432-8323.

### Program Length

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

### Tuition Fees 1999/2000 (subject to change)

\$4676.60 for the two-year program.

### Books and Supplies 1999/2000

First year: \$1585; Second year: \$1035 (general estimated cost and subject to change).

### Degree Transfer/Completion

There are good transfer arrangements with several universities and approximately 50 per cent of our students ultimately continue to engineering degrees.

### Accreditation

The program is accredited by the Applied Science Technologists and Technicians of British Columbia.

## Entrance Requirements

High school graduation. English 12. Math 12. Physics 11 or Chemistry 11. Completion of Earth Sciences 11 and Geology 12 is strongly recommended. Applicants who have completed Earth Sciences 11 and Geology 12 are eligible to apply for a BCIT course credit in MINE 1101.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school Counsellor or BCIT Registration and Information at (604) 434-1610.

## Engineering Technology Entry (ETE)

This full-time, day school program provides academic upgrading to students wishing to enrol in engineering-based technology programs at BCIT.

For information about the ETE program, please refer to page 51 of this Calendar.

## Technology Entry with English Language Training Program (TEWELT)

This program is offered through Academic Studies and runs concurrently with the ETE January intake. Computer literacy, math and physics lectures are common courses with ETE, but TEWELT has its own extended communication course which focuses on skills needed by students who require English language training. For more information about the TEWELT program please refer to page 52 of this calendar.

## Program Content — Mining

Level I	(15 weeks)	hrs/wk	credits
CHEM 1102	Chemistry I for Mining/Petroleum	6.0	6.0
COMM 1135	Introduction to Technical Communication	3.0	3.0
MATH 1501	Technical Mathematics for Mining	5.0	5.0
MINE 1101	Introductory Geology	3.5	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 I	6.0	6.0
SURV 1140	Surveying for Mining I	3.0	3.0

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## Mining cont.

Level 2		(20 weeks)	hrs/wk	credits
CHEM	2202	Chemistry 2 for Mining/Petroleum	6.0	8.0
COMM	2235	Technical Communication 2	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
MINE	2099	Mining Industry Experience		15.0
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)	hrs/wk	credits
CHSC	3305	Assaying	3.0	3.0
CHSC	3314	Mineral Processing	3.5	3.5
CHSC	3360	Environmental Applications	2.0	2.0
CIVL	1220	Statics and Strength of Materials	3.0	3.0
COMM	3350	Advanced Technical Communication for Mining	1.0	1.0
MATH	3501	Numerical Methods and Computing	5.0	5.0
MINE	3101	Structural Geology	3.5	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)	hrs/wk	credits
CHSC	4405	Assaying 2	3.0	4.0
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	1.0	1.5
MATH	4501	Numerical Methods/Statistics	5.0	6.5
MINE	4101	Geology: Mineral Deposits	3.5	4.5
MINE	4102	Mine Planning	4.0	5.5
MINE	4360	Environmental Applications	2.0	2.0
SURV	4440	Surveying for Mining 4	3.0	4.5

\*denotes half-time course.

**Note:** Term hours allocated currently under review.

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## Petroleum and Natural Gas

### Two-Year Diploma Program (Full-time)

Its large size and diversity make the oil and gas industry 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 continuing to be successful 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. Typical positions are 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.

**Processing and Refining:** 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.

## Petroleum and Natural Gas cont.

### The Program

Enables the graduate to successfully enter any of the major employment areas associated with the petroleum and natural gas industries. The first year covers topics related to petroleum geology, reservoir behavior, gas and oil reservoir evaluation and production, an introduction to oil field economics, gas processing and basic process equipment design. Emphasis is given to the chemistry, physics and mathematics courses that are essential to the understanding and application of engineering principals studied throughout the program.

The second year covers topics related to pipeline transmission, natural gas distribution, fuels, reservoir engineering and economics, principals of oil refining, and an introduction to heavy oil and bitumen upgrading (Tar Sand Technology). The use of the computer for both technology (process control) and business applications is emphasized and encouraged throughout the course.

Classroom and laboratory instruction is supplemented by field trips to local technology related installations whenever possible. Students are required to successfully participate in and complete an Industry/BCIT directed work experience project in their final term. This project includes participation in the work activities that would normally take place at a selected industry sponsor's place of business.

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.

### Tuition Fees 1999/2000 (subject to change)

\$4676.60 for the two-year program.

### Books and Supplies 1999/2000

First year: \$1280; Second year: \$950 (general estimated cost and subject to change).

### 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.

## Entrance Requirements

High school graduation. English 12. Math 12. Physics 11 or Chemistry 11. Completion of Earth Sciences 11 and Geology 12 would be an asset. Exemptions from academic requirements may be made in the case of mature applicants with practical experience in the industry. Applicants applying under this category should include a letter with their application outlining their request and apply as early as possible.

**Note** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

## Engineering Technology Entry (ETE)

This full-time, day school program provides academic upgrading to students wishing to enrol in engineering-based technology programs at BCIT.

For information about the ETE program, please refer to page of this Calendar.

## Technology Entry with English Language Training Program (TEWELT)

This program is offered through Academic Studies and runs concurrently with the ETE January intake. Computer literacy, math and physics lectures are common courses with ETE, but TEWELT has its own extended communication course which focuses on skills needed by students who require English language training. For more information about the TEWELT program please refer to page 52 of this calendar.

## Program Content — Petroleum and Natural Gas

Level I	(15 weeks)	hrs/wk	credits
CHEM 1102	Chemistry I for Mining/ Petroleum	6.0	6.0
CHSC 1106	Engineering Materials Petroleum*	4.0	3.5
COMM 1135	Technical Communication I	3.0	3.0
MATH 1471	Technical Mathematics for Petroleum	5.0	5.0
PETR 1101	Petroleum Geology	4.0	4.0
	1102 Properties of Reservoir Fluids	3.0	3.0
PHYS 1147	Physics for Mining/Petroleum	6.0	6.0

*continued next page*

**Petroleum and Natural Gas cont.**

<b>Level 2 (20 weeks)</b>		<b>hrs/wk</b>	<b>credits</b>
CHEM	2202 Chemistry 2 for Mining/Petroleum	6.0	8.0
COMM	2235 Technical Communication 2	3.0	4.0
COMP	1135 Computer Applications I	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
<b>Level 3 (15 weeks)</b>		<b>hrs/wk</b>	<b>credits</b>
CHSC	3341 Unit Operations I	6.0	6.0
CHSC	3351 Pollution Control	3.0	3.0
MATH	3471 Differential Equations for 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
COMP	2135 Computer Applications II	3.0	3.0
PETR	3300 Petroleum Technology Sketching	2.0	2.0
<b>Level 4 (20 weeks)</b>		<b>hrs/wk</b>	<b>credits</b>
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.

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**Renewable Resources****Forestry****Fish, Wildlife, and Recreation****Two-Year Diploma Program (Full-time)****Three Year Cooperative Education Diploma Program (Full-time)**

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 and with private consultants. 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.



## Renewable Resources cont.

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 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 the 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 specific needs of employers.

The Cooperative Education program option will require students to spend additional time in the technology to obtain an enhanced Cooperative Education Diploma in either discipline. For the majority of the extra time, Co-op students may be employed in their field of study. The completion of the Co-op option will take place on-campus with the provision of a fifth term of academic study.

The Co-op option requires students to complete five academic terms and a minimum of two Co-op Work Terms. The table below shows how the Renewable Resources academic curriculum is integrated with the Co-op work terms.

### Cooperative Education Timetable

Year	Sep -Dec.	Jan.-Apr.	May-Aug.
1	Academic Term 1	Academic Term 2	Work Term 1
2	Academic Term 3	Academic Term 4	Work Term 2
3	Work Term 3	Academic Term 5	Graduate

Students interested in pursuing the Renewable Resources Co-op program option should approach their respective program head, or the Cooperative Education Office, for more information.

### Accreditation

The program is accredited at the technologist level by the Applied Science Technologists and Technicians of B.C.

## Entrance Requirements

### Forestry Option

High School Graduation. English 12(C+) Math 11(C+) two sciences at the Grade 11 or Grade 12 level or equivalent post secondary science courses with a minimum C+. One of the sciences must be from; physics, chemistry or biology. The second science may include geology, earth sciences, applied physics, resource science 12, geography.

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.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

### Fish, Wildlife and Recreation Option

High school graduation. English 12(C). Math 11(C+). Biology 11(C). Any one additional science course at the grade 11 or 12 level. The science course may be chosen from the following: Biology, Chemistry, Physics or Applied Physics, Earth Science, Geology, or Science and Technology. The science course must have been completed with an achievement of (C) or higher. Chemistry is strongly recommended. A resume must accompany the application. Relevant work experience in natural resources strengthens an application. Due to the physical requirements of the Fish, Wildlife and Recreation program, good health is required. You may be required to obtain and submit a medical clearance prior to admission to the program.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

*continued next page*

## Renewable Resources cont.

### Cooperative Education Program Option

Those wishing to enter the Co-op option must be full-time Renewable Resources students and achieve 65 per cent or better in all Term 1 courses.

### Engineering Technology Entry (ETE)

This full-time, day school program provides academic upgrading to students wishing to enrol in engineering-based technology programs at BCIT.

For information about the ETE program, please refer to page 51 of this Calendar.

### Technology Entry with English Language Training Program (TEWELT)

This program is offered through Academic Studies and runs concurrently with the ETE January intake. Computer literacy, math and physics lectures are common courses with ETE, but TEWELT has its own extended communication course that focuses on skills needed by students who require English language training. For more information about the TEWELT program please refer to page 52 of this calendar.

### Program Length

Two years, full-time beginning in September each year. Cooperative Education Program Option is three years, full-time.

### Tuition Fees 1999/2000 (subject to change)

\$4676.60 for the two-year program. Co-op fees are \$377.50 per co-op work term. Academic fees to be determined.

**Note:** An additional field trip fee of approximately \$100 may be incorporated into second year Fish, Wildlife and Recreation tuition, starting in September, 1998.

### Books and Supplies 1999/2000 Forestry

First year: \$1200; Second year: \$800

### Fish, Wildlife and Recreation

First year: \$1175; Second year: \$1300  
(general estimated cost and subject to change).

### Expenses

In addition to tuition fees, books, supplies and equipment, students will incur expenses for field trips and a first-aid course. These expenses are approximately \$500 for first year and \$1000 for second year.

## Program Content — Forestry

Level 1	(15 weeks)	hrs/wk	credits
COMM 1145	Technical Communication 1 for Renewable Resources	4.0	4.0
MATH 1451	Technical Mathematics for Renewable Resources	5.0	5.0
RENR 1105	Natural Resource Measurement 1	4.0	4.0
RENR 1110	Microcomputer Applications (Forestry)	3.0	3.0
RENR 1120	Photo Interpretation and Mapping 1	4.0	4.0
RENR 1150	Ecology, Plants, Soils 1	6.0	6.0
RENR 1166	Integrated Resource Management 1	1.0	1.0
Level 2	(20 weeks)	hrs/wk	credits
COMM 2245	Technical Communication 2 for RENR	3.0	3.5
MATH 2453	Statistics for Renewable Resources	4.0	4.0
RENR 2106	Natural Resource Measurements 2 (Theory)	3.0	3.5
RENR 2107	Natural Resource Measurements 2 Practical	2.0	2.0
RENR 2116	Applied Ecology in BC	3.0	3.5
RENR 2135	Fire Management 1	3.0	3.5
RENR 2141	Air Photo and Digital Mapping	6.0	7.0
RENR 2166	Integrated Resource Management 2	1.0	1.0
RENR 2150	Ecology, Plants, Soils 2	6.0	7.0
Level 3	(15 weeks)	hrs/wk	credits
COMM 3345	Technical Communication 3 for Forestry Resources	2.0	2.0
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)	4.0	3.0
RENR 3145	Silviculture 1*	4.0	3.5
RENR 3150	Forest Insects and Diseases 1*	4.0	3.5
RENR 3160	Forest Engineering 1	6.5	6.5
RENR 3165	GIS	3.0	3.0
RENR 3166	Computer Applications for Forestry	4.0	3.0
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 3175	Independent Studies* (a 2-week course)	30.0	4.0
RENr 3181	Technical Project 2 (Forestry)	2.0	2.0
RENr 4107	Natural Resource Measurements 4	5.0	5.0
RENr 4145	Silviculture 2	7.0	7.0
RENr 4150	Forest Insects and Diseases 2	5.0	5.0
RENr 4160	Forest Engineering 2	6.5	6.5
RENr 4166	Applied Forest Management	5.0	5.5

### Program — Fish, Wildlife and Recreation

Level 1	(15 weeks)	hrs/wk	credits
COMM 1145	Introduction to Technical Communications	4.0	4.0
MATH 1451	Basic Technical Mathematics for Renewable Resources	5.0	5.0
FOOD 1241	Zoology I for FWR	2.0	2.0
RENr 1105	Natural Resource Measurements	4.0	4.0
RENr 1110	Microcomputer Applications	3.0	3.0
RENr 1120	Photo Interpretation and Mapping I	4.0	4.0
ECON 1150	Ecology, Plants, Soils I	6.0	6.0
RENr 1166	Integrated Resource Management I	1.0	1.0

Level 2	(20 weeks)	hrs/wk	credits
COMM 2245	Technical Communication 2 for RENr	3.0	3.5
FOOD 2241	Zoology 2 for FWR	2.0	2.0
MATH 2453	Statistics for RENr	4.0	4.0
RENr 2106	Natural Resource Measurements 2 (Theory)	3.5	3.0
RENr 2107	Natural Resource Measurements 2 Practical	2.0	2.0
RENr 2116	Applied Ecology in BC	3.0	3.5
RENr 2135	Fire Management I	3.0	3.5
RENr 2141	Air Photo and Digital Mapping	6.0	7.0
RENr 2150	Ecology, Plants, Soils 2	6.0	7.0
RENr 2166	Integrated Resource Management 2	1.0	1.0

Level 3	(15 weeks)	hrs/wk	credits
COMM 3353	Advanced Technical Communication FWR	2.0	2.0
RENr 2190	Environmental Monitoring	3.0	3.0
RENr 3215	Recreational Land Management I	7.0	7.0
RENr 3220	Wildlife Management I	7.0	7.0
RENr 3225	Fish Management I	7.0	7.0
RENr 3230	Projects I FWR	6.0	6.0

Level 4	(20 weeks)	hrs/wk	credits
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

Additional courses to be completed	credits
RENr 2990 Co-op Work Term 1 to be completed after Level 2	15.0
RENr 3990 Co-op Work Term 2 to be completed after Level 4	15.0
RENr 4990 Co-op Work Term 3 to be completed after Level 4	15.0

### Level 5 (12 weeks)

Term course selections are subject to change as the curriculum is upgraded and refined.

In the fifth academic term, the BCIT Renewable Resources Technology Cooperative Education students (Forestry and Fish, Wildlife and Recreation Co-op options) study together to receive instruction in the following topic areas.

Courses	credits
RENr 5001 Natural Resource Business Administration	2.0
RENr 5002 Forest Practices Auditing	1.0
RENr 5010 Integrated Resource Planning	1.0
RENr 5100 Riparian Management Area Guidebook Course	1.0
TMGT 7102 Project Management/Resource Utilization	1.0
TMGT 7143 Problem Solving and Decision Making	1.0
RENr 5200 Urban Watershed Restoration	1.0
RENr 5300 Multi Cultural Awareness and Training	1.0
RENr 5310 Integrated Research Project	2.0
EENG 8804 Hydrological Mapping and Hydrometrics	1.0
EENG 8783 Risk Management	1.0
EENG 8784 Environmental Law 2	1.0

continued next page

## Renewable Resources cont.

### Faculty and Staff

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#### Fish, Wildlife and Recreation Option

M. Coulter-Boisvert, Boisvert, Department of Fisheries and Oceans  
 B. Farquar, GVRD  
 W. Henwood, Parks Canada, Chair  
 M. Kotyk, District of North Vancouver  
 D. Lowe, Ministry of Environment, Lands and Parks  
 D. MacLaurin, Consultant  
 R. McKelvey, Canadian Wildlife Service  
 J. Millar, Ministry of Environment, Lands and Parks  
 R. Moody, Habitat Conservation Fund  
 B. Nyberg, Ministry of Forests  
 W. Pollard, MacMillan Bloedel  
 S. Quinn, Sechelt Band Education Center  
 B. Richman, Department of Fisheries and Oceans  
 I. Robertson, Consultant  
 M. Saddler, Sechelt Band Education Center  
 R. Simpson, Port Moody Ecological Society  
 H. Smith, B.C. Hydro  
 M. Turner, Ministry of Environment, Lands and Parks  
 G. Wightman, Ministry of Environment, Lands and Parks  
 B. White, Pacific Salmon Commission  
 I. Whyte, Envirowest Consultants Ltd.

## Forestry Option

B. Baumann, Baumann Engineering  
 B. Blackwell, B.M. Blackwell and Associates  
 D. Bonin, GVRD  
 D. Campbell, Ministry of Forests  
 P. Daigle, Ministry of Forests  
 D. Jepsen, Western Forest Products Ltd.  
 L. Kaivanto, Ministry of Advanced Education, Training and Technology  
 D. Lockwood, Beaumont Timber Company Ltd.  
 M. Mosher, M. Mosher and Associates  
 G. Rattray, Cariboo Lumber  
 D. Reed, Ministry of Forests  
 D. Swensson, Simons Reid Collins  
 C. Webb, Ministry of Forests  
 R. Willis, Weyerhaeuser Grandview  
 D. Yochim, Associate of B.C. Professional Foresters

### Cooperative Education

B. Richman, Department of Fisheries and Oceans, Chair  
 W. Henwood, Parks Canada  
 D. Jepsen, Western Forest Products  
 S. deMelt, Ministry of Forests  
 R. deBoo, Ford Foresters

*Plug-in to  
Mother Nature.*



# Transportation



*“The Motorcycle Mechanic ELTT course at BCIT enabled me to get a successful start in the motorcycle industry by teaching me the fundamental skills and theory required as a motorcycle mechanic.”*

*~ Marcie Ladubec, 1998 Motorcycle Mechanic/ELTT graduate & Motorcycle Mechanic's Apprentice, Richmond Motor Sports*

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## Administration Transportation Training Department

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### Marine Training - PMTC

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Jeff Mica, Chief Instructor, Motorcycle/Marine,  
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## Aircraft/Aviation Programs

### Aircraft Electronics Technician (Avionics)

#### Diploma of Trades Training (Full-time)

Aircraft Electronics Technicians (Avionics) are responsible for the servicing, repair and modification of aircraft electronic systems and components. It is a job that includes removing and installing components, 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 47-week program is designed to follow a National/International set of standards and is approved by Transport Canada. It provides an in-depth knowledge of today's modern aircraft electronics, incorporating the electronics theory obtained in the Electronic Core Program. You will learn the interpretation and compliance of Transport Canada regulations and airworthiness standards.

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 per cent of the time, while gaining hands-on experience 50 per cent of the time. The course is conducted in a large hangar at the Vancouver International Airport. The campus has a well-equipped Avionics shop and more than 18 aircraft, both fixed wing and rotary, to work on. The student will perform a variety of tasks from installing equipment on aircrafts, to bench performance testing and troubleshooting both aircraft and avionics components.

### Grading

Minimum course passing grade is 70 per cent for each course. All courses must be passed in order to successfully complete the program.

### Program Length

Full-time, 47 weeks.

### Normal Course Hours

0800-1530, Monday through Friday.

### Tuition Fees 1999/2000 (subject to change)

\$1051.40 per term, for 3 terms.

### Books and Supplies 1999/2000

\$720 (general estimated cost and subject to change).

### Entrance Requirements

BCIT Electronics Common Core Program or equivalent. High school graduation. English 12 or Communications 12. Academic Math 11 (C), (Math 12 recommended). BCIT pretest is acceptable for English only.

### National Occupational Standards for Aircraft/Aviation Programs

The occupational standards and training standards for the 13 trades in the aviation industry are currently under 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.

### Applied Academics

Applied Academics courses taught in B.C. High Schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

### Trades Discovery for Women

This full-time program is designed to prepare participants to successfully enter and complete a Trades Training program.

For information about the Trades Discovery for Women program, please refer to page 52 of this Calendar.

### Fresh Start

This full-time technical literacy program provides academic upgrading in an applied setting for students wishing to enter a trades/technical program at BCIT.

For information about the Fresh Start program, please refer to page 51 of this calendar.

### Industry Policies

- A security check will be required to work on airports.
- Some sectors of the aviation industry screen for drug and alcohol use
- Most aviation companies require grade 12 completion as a hiring policy
- Excellent attendance is an important issue at most aviation companies

### Tool Box Loans

BCIT loans to students, free of charge, a set of aviation hand tools. A refundable deposit of \$100 will be charged and the cost of lost or damaged tools may be deducted from the deposit upon completion of the course.

### Aviation Attendance Policy

Attendance policy for all Aviation programs differ from other BCIT programs and are regulated by Transport Canada and C.A.M.C.

### Canadian Aviation Regulation 566 states:

*"Students having missed more than 5 per cent of the course through absences shall not qualify for experience credit. Lost time in excess of 5 per cent can be made up through documented studies, equivalent to that missed from the program. The 5 per cent policy is intended for illness, bereavement or other circumstances beyond the individual's control."*

### Program Content —

#### Aircraft Electronics Technician (Avionics)

Term I	(16 weeks)	Hours
AVAV 1005	Introduction to Aircraft Maintenance (including Air Regs) I	20
AVAV 1010	Familiarization of Aircraft Systems	120
AVAV 1015	Electrical Power Distribution	120
AVAV 1020	Aircraft Instruments and Auto Flight (A.F.C.S.)	120

*continued next page*

## Aircraft Electronics Technician cont.

Term 2 (17 weeks)		Hours
AVAV 2010	Radio Communications - Theory I	50
AVAV 2015	Avionics Installation - Practical	120
AVAV 2020	Avionics Systems - Theory (include electronic test equip)	240
Term 3 (14 weeks)		Hours
AVAV 3005	Flight Line Maintenance	
	Avionics (including Air Regs)	120
AVAV 3015	Communication, VHF, F.M., H.F. - Lab	90
AVAV 3020	Navigation, ADF, VOR ILS - Lab	90
AVAV 3025	Pulse OME, TXP, RAD ALT., RADAR - Lab	90
AVAV 3030	Avionics Techniques	30
<b>Total</b>		<b>1410</b>

### Instructors

Doug Grant, A.M.E.

Doug Smith, A.M.E.

## Aircraft Gas Turbine Technician

### Certificate Program (Full-time)

Turbine Engine Technicians enjoy a very challenging occupation that requires a high degree of responsibility and skill. Technicians perform the disassembly, inspection, repair, assembly and testing of gas turbine engines in a clean shop environment with regular working hours. In this rapidly changing technological field, qualified technicians experience many opportunities for advanced training and continued career satisfaction.

The Aircraft Gas Turbine Engine Repair and Overhaul Technician program is a new program developed by BCIT, the Canadian Aviation Maintenance Council (C.A.M.C.) and the turbine engine overhaul industry. This program was designed to meet industry's need for basic training and technician certification within this field. Successful completion of this program, followed by a three year apprenticeship, qualifies candidates for Interprovincial Certification from C.A.M.C.

### Job Opportunities

The men and women who enter this career path find employment in engine repair and overhaul facilities across Canada. These shops range in size from small family run businesses to large airlines. There is also a demand for individuals with this training in the aircraft component and propeller over-haul business, as well as pipeline pumping and stationary power generation facilities. Recent surveys indicate excellent job placement rates.

### The Program

The Gas Turbine Technician program is conducted at BCIT's Aviation campus at the Vancouver International Airport. This program is a hands-on trades training program consisting of 40

per cent theory and 60 per cent practical. Students have access to a wide variety of gas turbine engines, extensive engine tooling and qualified instructors. Along with theory studies, students perform tasks ranging from the use of basic hand tools to complete disassembly, inspection and assembly of gas turbine engines. Intricate assembly procedures and extensive use of technical manuals require good manual dexterity and strong reading comprehension skills for successful completion of this program.

### Grading

Minimum course passing grade is 70 per cent for each course. All courses must be passed in order to successfully complete the program.

### Program Length

Full-time, 38 weeks, beginning in September of each year.

### Normal Course Hours

0800 - 1530, Monday through Friday.

### Tuition Fees 1999/2000 (subject to change)

\$1335.70 for the 38-week program.

### Books and Supplies 1999/2000

\$734 (general estimated cost and subject to change).

### Entrance Requirements

High school graduation. English 12 or Communications 12. Any Math course at the grade 11 level. BCIT pretest is acceptable for English and Math. Also, applicants are recommended to have completed one of: Technical Education 11, General Mechanics 11, or Automotive Mechanics 11.

### National Occupational Standards for Aircraft/Aviation Programs

The occupational standards and training standards for the 13 trades in the aviation industry are currently under 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.

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- A security check will be required to work on airports.
- Some sectors of the aviation industry screen for drug and alcohol use
- Most aviation companies require grade 12 completion as a hiring policy
- Excellent attendance is an important issue at most aviation companies

## Tool Box Loans

BCIT loans to students, free of charge, a set of aviation hand tools. A refundable deposit of \$100 will be charged and the cost of lost or damaged tools may be deducted from the deposit upon completion of the course.

## Aviation Attendance Policy

Attendance policy for all Aviation programs differ from other BCIT programs and are regulated by Transport Canada and C.A.M.C.

## Canadian Aviation Regulation 566 states:

*"Students having missed more than 5 per cent of the course through absences shall not qualify for experience credit. Lost time in excess of 5 per cent can be made up through documented studies, equivalent to that missed from the program. The 5 per cent policy is intended for illness, bereavement or other circumstances beyond the individual's control."*

## Program Content — Aircraft Gas Turbine Technician

The program is broken into two terms which covers the following subject areas:

### Term 1 (16 weeks)

- AVGT 1001 Engine Shop
- AVGT 1006 Turbine Engine Theory, Construction and Systems

### Term 2 (22 weeks)

- AVGT 2002 Repair and Overhaul Practices I
- AVGT 2004 Repair and Overhaul Practices II
- AVGT 2010 Operation, Testing and Certification

## Instructors

Brian Proulx, A.M.E.

## Aircraft Maintenance Engineer: Category M

### Diploma of Trades Training (Full-time)

Aircraft Maintenance Engineers (A.M.E.) are responsible for the release (certification) of an aeronautical product (aircraft), after maintenance or inspection. It is a responsible job that 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 transport category aircraft. The larger aircraft are quite sophisticated in that they may possess many different electronic, electrical, pneumatic, hydraulic, mechanical and propulsion systems, and the A.M.E. must be able to maintain them.

### 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 the 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 Labor, 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 per cent of the time, while gaining hands-on experience 60 per cent 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 through troubleshooting of an operable aircraft.

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## Aircraft Maintenance Engineer: Category M cont.

### Grading

Minimum course passing grade is 70 per cent average for each course. All courses must be passed in order to successfully complete the program.

### Program Length

Full-time, 16 months.

### Normal Course Hours

0800-1530, Monday through Friday.

### Tuition Fees 1999/2000 (subject to change)

\$1051.40 per term.

### Books and Supplies 1999/2000

\$729 for the 16-month program (general estimated cost and subject to change).

### Entrance Requirements

High school graduation. English 12 or Communications 12. Academic Math 11. Applicants must also meet one of the following entrance requirements: Technical Education 11 (C+), General Mechanics 11 (C+), Automotive Mechanics 11 (C+), Physics 11 (Pass), BCIT Mechanical Aptitude Test. BCIT pretest is acceptable for English Math and Mechanical aptitude. Good color 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.

### National Occupational Standards for Aircraft/Aviation Programs

The occupational standards and training standards for the 13 trades in the aviation industry are currently under 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.

### Applied Academics

Applied Academics courses taught in B.C. High Schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

## Trades Discovery for Women

This full-time program is designed to prepare participants to successfully enter and complete a Trades Training program.

For information about the Trades Discovery for Women program, please refer to page 52 of this Calendar.

### Fresh Start

This full-time technical literacy program provides academic upgrading in an applied setting for students wishing to enter a trades/technical program at BCIT.

For information about the Fresh Start program, please refer to page 51 of this calendar.

### Industry Policies

- A security check will be required to work on airports.
- Some sectors of the aviation industry screen for drug and alcohol use
- Most aviation companies require grade 12 completion as a hiring policy
- Excellent attendance is an important issue at most aviation companies

### Tool Box Loans

BCIT loans to students, free of charge, a set of aviation hand tools. A refundable deposit of \$100 will be charged and the cost of lost or damaged tools may be deducted from the deposit upon completion of the course.

### Aviation Attendance Policy

Attendance policy for all Aviation programs differ from other BCIT programs and are regulated by Transport Canada and C.A.M.C.

### Canadian Aviation Regulation 566 states:

*"Students having missed more than 5 per cent of the course through absences shall not qualify for experience credit. Lost time in excess of 5 per cent can be made up through documented studies, equivalent to that missed from the program. The 5 per cent policy is intended for illness, bereavement or other circumstances beyond the individual's control."*

## Program Content — Aircraft Maintenance Engineer: Category M

### Courses

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	2210	Sheet Metal
AVAM	2211	Aircraft Systems I (Plumbing, Hydraulics, Landing Gear)
AVAM	3300	Control Systems and Rigging
AVAM	3301	Rotary Wings
AVAM	3302	Propellers
AVAM	3303	Gas Turbines
AVAM	3304	Powerplant Systems
AVAM	4400	Instruments
AVAM	4401	Aircraft Systems 2
AVAM	4403	Aircraft Maintenance, Inspection and Repair
AVAM	4404	Aircraft Maintenance Techniques and Procedures
AVAM	4412	Basic Avionics

### Instructors

Jack Baryluk, A.M.E., Chief Instructor, jbaryluk@bcit.bc.ca  
 Larry Bell, A.M.E., lbell@bcit.bc.ca  
 Trevor Castle, A.M.E.  
 Cam Dryhurst, A.M.E.  
 John Edwards, A.M.E., jedwards@bcit.bc.ca  
 Robert Grasby, A.M.E.  
 Brian Lockwood, A.M.E.  
 Stephen Peszel, A.M.E., speszel@bcit.bc.ca  
 Kal Tiwana, A.M.E.  
 David Upton, A.M.E., dupton@bcit.bc.ca

## Aircraft Mechanical Component Technician

### Certificate Program

Aircraft Mechanical Component Shop Technicians are involved in the overhaul, repair, modification, inspection, testing and certification of aviation components of pneumatic, hydraulic, fuel, electrical, environmental and mechanical aircraft systems. Working in a shop environment, technicians are thoroughly familiar with the set-up and operation of tools and shop equipment as well as some semi-automatic processes. Possessing a high degree of manual dexterity, and a strong interest in mechanics, they work cooperatively with others and are able to follow directions precisely.

The Aircraft Mechanical Component Technician program is a new program developed by BCIT, the Canadian Aviation Maintenance Council (C.A.M.C.) and the component overhaul industry. This program is designed to meet the growing need for basic component overhaul training and certification within this field. The successful completion of this program is normally followed by a three-year apprenticeship.

### Job Opportunities

The men and women who enter this career path can expect to find employment with companies who specialize in aircraft component overhaul (e.g. Approved Maintenance Organizations (A.M.O.'s) involved in the manufacture and overhaul of airframe systems, as well as major airlines). As a C.A.M.C. developed course, the training and associated jobs skills provided are recognized anywhere in Canada. Recent trends indicate a strong demand for individuals trained in aviation component overhaul.

### The Program

The program is designed to follow the C.A.M.C. requirements for training in the field of component overhaul. As a C.A.M.C. developed course, students may be credited with 8 months towards the 48-month requirement for C.A.M.C. certification. (C.A.M.C. membership and the appropriate supporting documentation are required to receive this certification.) Taught at the newly refurbished BCIT, Sea Island facility located on Vancouver International Airport's south side, the instruction consists of approximately 60 per cent class-room theory and 40 per cent "hands-on" practical training. As part of the curriculum practical tasks involve: disassembly, inspection, repair and testing of hydraulic, pneumatic, mechanical, fuel, and electrical components. The Sea Island campus has a wide-range of tools and training aids available, and a collection of 18 aircraft.

### Grading

Minimum pass mark is 70 per cent. All courses must be passed in order to successfully complete the program.

### Program Length

29 weeks full-time

### Normal Course Hours

0800 – 1530 Monday - Friday

### Entrance Requirements

High School Graduation. English 12 or Communications 12. Academic Math 11 with a (C) or better. BCIT pretest in Math and English is acceptable.

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## Aircraft Mechanical Component Technician cont.

### National Occupational Standards for Aircraft/Aviation Programs

The occupational standards and training standards for the 13 trades in the aviation industry are currently under 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.

### Applied Academics

Applied Academics courses taught in B.C. High Schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

### Trades Discovery for Women

This full-time program is designed to prepare participants to successfully enter and complete a Trades Training program.

For information about the Trades Discovery for Women program, please refer to page 52 of this Calendar.

### Fresh Start

This full-time technical literacy program provides academic upgrading in an applied setting for students wishing to enter a trades/technical program at BCIT.

For information about the Fresh Start program, please refer to page 51 of this calendar.

### Industry Policies

- A security check will be required to work on airports.
- Some sectors of the aviation industry screen for drug and alcohol use
- Most aviation companies require grade 12 completion as a hiring policy
- Excellent attendance is an important issue at most aviation companies

### Tool Box Loans

BCIT loans to students, free of charge, a set of aviation hand tools. A refundable deposit of \$100 will be charged and the cost of lost or damaged tools may be deducted from the deposit upon completion of the course.

### Aviation Attendance Policy

Attendance policy for all Aviation programs differ from other BCIT programs and are regulated by Transport Canada and C.A.M.C.

### Canadian Aviation Regulation 566 states:

*"Students having missed more than 5 per cent of the course through absences shall not qualify for experience credit. Lost time in excess of 5 per cent can be made up through documented studies, equivalent to that missed from the program. The 5 per cent policy is intended for illness, bereavement or other circumstances beyond the individual's control."*

### Program Content —

#### Aircraft Mechanical Component Technician

##### Term 1 – 16 weeks

AVCO	1005	Introduction to Aircraft Maintenance	185 hr	12.5
AVCO	1010	Familiarization to Aircraft Systems	165 hr	11.0
AVCO	1015	Basic AC/DC Electricity Level 1	130 hr	8.5
Total			480 hr	32.0

##### Term 2 – 13 weeks

AVCO	2005	Work Source & Documentation	15 hr	1.0 cr
AVCO	2010	Hydraulic Components	85 hr	5.5
AVCO	2015	Fuel System Components	55 hr	3.5
AVCO	2020	Pneumatic Components	30 hr	2.0
AVCO	2025	Tire, Wheel, & Brake Systems	45 hr	3.0
AVCO	2030	Landing Gear Systems	65 hr	4.5
AVCO	2035	Flight Controls	50 hr	3.5
AVCO	2040	Air Conditioning Systems	45 hr	3.0
Level 2 Total			390 hr	26.0
Total			870 hr	58.0 cr

## Aircraft Structures Manufacturing Technician

### Associate Certificate of Trades Training (Full-time)

Course prepares graduates to enter the Aircraft Structures Manufacturing Industry. Continued studies through an apprenticeship or part-time studies course could lead to a trade qualification and/or national recognition as a Structural Repair Technician.

### Job Opportunities

Available at aerospace manufacturers throughout Canada.

## The Program

The program is designed in consultation with the aerospace manufacturers and the Industrial Training and Apprenticeship Commission. The pre-employment portion is conducted at BCIT's Sea Island campus at the Vancouver International Airport. Successful candidates may be considered for employment by local manufacturers and enter a part-time studies or apprenticeship training program.

## Grading

A passing grade of 70 per cent in all subjects is required for successful completion of the program.

## Program Length

Full-time, 16 weeks

## Normal Course Hours

08:00 – 15:30, Monday through Friday

## Entrance Requirements

High school graduation.

## Program Content —

### Aircraft Structures Manufacturing Technician

#### Term 1 (16 weeks)

AVST 1002 Fundamentals of Shop Practices and Aircraft Structures – Safety, Tools and Equipment, Technical Drawings, Technical Information, Basic Metallurgy, Aero Dynamics, Aircraft Structure, Components and Functions. 5 Weeks

AVST 1007 Fundamentals of Aircraft Sheet Metal Construction – Sheet Metal Fabrications, Sealing, Corrosion Control, Heat Treatment. 3 Weeks

AVSM 1001 Aero Structures – Processes, Jigs, Metal Forming 3 Weeks

## National Occupational Standards for Aircraft/Aviation Programs

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## Instructor

Ed Gunn, A.M.E., B. Ed.

## Aircraft Structures Technician

### Certificate Program (Full-time)

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 including Maintenance Technicians, Avionics Technicians and professional engineers. He/she will be expected to precisely follow aircraft fabrication and repair schemes for aluminum, titanium and stainless steel structures, 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 may be employed in helicopter or light aircraft repair, airline maintenance of aircraft and component manufacturing. Some graduates have gone on to manage or own shops.

### The Program

The program was designed, in consultation with industry advisors, to meet the Canadian Aviation Maintenance Council (C.A.M.C.) training standards. The student will attend lectures approximately 40 per cent of the time, while gaining hands-on experience 60 per cent 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.

### Grading

Minimum passing grade for each course is 70 per cent. Each course must be passed in order to successfully complete the program.

### Program Length

Full-time, 37 weeks.

### Normal Course Hours

0800-1530, Monday through Friday.

### Tuition Fees 1999/2000

Level One: tuition \$667.85

Level Two: tuition \$632.70

### Books and Supplies 1999/2000

\$576 (general estimated cost and subject to change).

### Entrance Requirements

High school graduation. English 12 or Communications 12.

Academic Math 11 or Introduction to Math 11 or Math 11A or Aviation Trade Math. BCIT pretest is acceptable for English and Math. Some drafting is recommended. Mature students may be given special consideration, subject to an interview and testing by instructional staff.

### National Occupational Standards for Aircraft/Aviation Programs

The occupational standards and training standards for the 13 trades in the aviation industry are currently under 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.

### Applied Academics

Applied Academics courses taught in B.C. High Schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

### Trades Discovery for Women

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For information about the Trades Discovery for Women program, please refer to page 52 of this Calendar.

### Fresh Start

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### Industry Policies

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**Tool Box Loans**

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**Aviation Attendance Policy**

Attendance policy for all Aviation programs differ from other BCIT programs and are regulated by Transport Canada and C.A.M.C.

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**Program Content —  
Aircraft Structures Technician**

<b>Level 1 (16 weeks)</b>			
AVST	1002	Fundamentals of Shop Practices and Aircraft Structures	150 10.0
AVST	1007	Fundamentals of Aircraft Sheet Metal Construction	240 16.0
AVST	1012	Adv Aircraft Sheet Metal Construction	90 6.0
<b>Level 2 (21 weeks)</b>			
AVST	2001	Air Regulations	30 2.0
AVST	2006	Structural Damage/Assessment/Repair	330 22.0
AVST	2008	Aircraft Composite Fabrication	60 4.0
AVST	2011	Aircraft Composite Repairs	60 4.0
AVST	2016	Specialized Aircraft Processes/Practices	150 10.0

**Instructors**

Malcolm Stirling, A.M.E., mstirling@bcit.bc.ca  
Jim Henke, A.M.E.

## Automotive Programs

### Auto Collision Repair/Refinishing

#### Cooperative Trades Training Diploma Program (Full-time)

**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 color vision and freedom from respiratory problems; must be non-allergic to paint and thinners; and clean shaven as per WCB regulations. Potential students with medical or physical difficulties should contact the Educational Resource Centre for Students with Disabilities to arrange an interview (telephone interview if out of town) with the Institute's Rehabilitation Specialist, (604) 451-6963.

**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 visit our cooperative training section on the Web.

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 at the Burnaby campus.

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## Auto Collision Repair/Refinishing cont.

### Program Length

Total length of the program is 87 weeks, full-time, which includes a 32-week work term.

### Normal Course Hours

Level One: Auto Collision 0630-1445,

Monday through Thursday.

Level Two/Three: Repair 0630-1445,

Monday through Thursday.

Level Two/Three: Refinishing 0630-1445,

Tuesday through Friday.

### Tuition Fees 1999/2000 (subject to change)

\$2199.20 for the 87-week program.

### Books and Supplies 1999/2000

\$1371 (general estimated cost and subject to change).

### Entrance Requirements

High school graduation. English 12 or Communications 12. Any Math course at the grade 11 level. BCIT pretest is acceptable for English and Math. A valid B.C. driver's license 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 all program requirements have been met. Good physical condition, freedom from respiratory problems and non-allergic to paint thinners, etc.

### Applied Academics

Applied Academics courses taught in B.C. High Schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

### Trades Discovery for Women

This full-time program is designed to prepare participants to successfully enter and complete a Trades Training program.

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### Fresh Start

This full-time technical literacy program provides academic upgrading in an applied setting for students wishing to enter a trades/technical program at BCIT.

For information about the Fresh Start program, please refer to page 51 of this calendar.

## 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	Co-op 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	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	Co-op 2

### Advanced (Auto Collision Refinishing)

ABOD	3301	Shop Management and Appraisal
ABOD	3355	Safe Work Practices
ABOD	3358	Refinishing Equipment
ABOD	3361	Topcoat Systems
ABOD	3362	Selected Repairs
ABOD	3364	Preparation Systems
ABOD	3365	Trends in Technology

### Advanced (Auto Collision Repair)

ABOD	3300	Safe Work Practices
ABOD	3301	Shop Management and Appraisal
ABOD	3304	Shop Equipment
ABOD	3305	Selected Repairs
ABOD	3306	Trends in Technology
ABOD	3307	Body Components/Replacement Panels
ABOD	3308	New Science of Unibody Repair

### Instructors

Kenny Herrewynen, Chief Instructor, kherrewy@bcit.bc.ca  
 Harry Evans  
 Clarence Heppner  
 Gordon Smith



## Automotive Electronics Technician

### Certificate Program (Full-time)

This program will take technicians through basic electrical diagnosis and repair to the latest state-of-the-art automotive electronics. Specific modules may be taken on a Part-time Studies day or evening basis.

### Job Opportunities

There is a major need for automotive technicians to fully understand electrical and electronic systems in order to keep pace with the industry. Electronics are everywhere, from fuel, ignition and engine management to accessories, ABS braking, steering, air bag control and climate control systems. Enhanced emission controls are also processed by on-board microcomputers.

This seventeen week program will be of interest both for students who wish to continue from Automotive Mechanic ELTT and for technicians who require upgrading.

Job opportunities exist in the following categories:

- automotive service technician
- automotive electrical and tune-up technician
- automotive electrical (off vehicle repair)
- automotive transmission (specialist)
- air conditioning, heating and cooling (climate control specialist)

As electronics are now an integral part of almost all automobile subsystems, understanding them will go a long way in ensuring a placement in today's competitive job market.

### Grading

Course passing grade is 64 per cent. An overall GPA of 70 per cent or better is required to successfully complete the program.

### Program Length

Full-time, 17 weeks.

### Normal Course Hours

1000 - 1645

### Tuition Fees 1999/2000 (subject to change)

\$597.55 for the 17-week program.

### Books and Supplies 1999/2000

\$558 (general estimated cost and subject to change).

## Entrance Requirements

- English 12 or Communications 12.
- Successful completion of Automotive Mechanic ELTT; or
- Apprentice with minimum two years in the trade; or
- Journeyed or T.Q. status (must provide license number); or
- Successful completion of a mechanical aptitude test through Ewan Sheard at (604) 451-6832, located in NE1-340
- A valid drivers license that is acceptable for use in B.C. is required

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## Fresh Start

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## Trades Discovery for Women

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## Automotive Electronics Technician cont.

### Program Content — Automotive Electronics Technician

Courses	Hours
AUTO 2101 Electrical Fundamentals	30
AUTO 2102 Wiring Diagrams and Circuit Repair	18
AUTO 2103 Battery Operations and Testing	12
AUTO 2104 Starter Operation and Testing	18
AUTO 2105 Charging System Operation and Testing	24
AUTO 2106 Fuel Delivery and Carburetion	24
AUTO 2107 Ignition Tune-up	30
AUTO 2108 Emission Controls/AirCare	30
AUTO 2109 Electronic Engine Controls	36
AUTO 2110 Driveability System Diagnostics	18
AUTO 2111 Lab Scope Operation and Diagnosis	12
AUTO 2112 GM Throttle body and Port Fuel Injection	24
AUTO 2113 Ford Central and Electronic Fuel Injection	24
AUTO 2114 Chrysler Single and Multi-point Fuel Injection	24
AUTO 2115 Fuel Injection – European Imports	24
AUTO 2118 Fuel Injection – Asian Imports	24
AUTO 2120 Alternate Fuels – Systems and Tuning	24
AUTO 2121 OBD II	12
AUTO 2122 Electronic Automatic Transmissions	24
AUTO 2123 Anti-lock Brakes and Traction Control	24
AUTO 2126 Supplemental Inflatable Restraint Systems	12
AUTO 2136 Electronic Suspension and Steering	6
AUTO 2138 Air Conditioning Operation and Controls	36
<b>Total</b>	<b>510</b>

## Automotive Mechanic ELTT

### Certificate Program (Full-time)

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 automobiles 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 as well as parts person and service writer careers. 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 trades.

## The Program

BCIT's ELTT program provides the basic knowledge and practical skills to meet the needs of both students and employers for entry into the automotive industry. Graduates will be able to pursue a career as a General Repair Technician or choose to specialize in one of the many specializations that has emerged. Students may apply to the Ministry of Labour for credit towards their Apprentice Technical Training, upon successful completion of the ELTT program. Successful completion of this program will enable students to enter the Automotive Electronics Technician program. This four month course addresses the need for additional electrical/electronics training on today's sophisticated vehicles.

Automotive mechanic students must have a valid driver's license. Good physical condition is desirable. Potential students with medical or physical difficulties should contact the Educational Resource Centre for Students with Disabilities to arrange an interview (telephone interview if out of town) with the Institute's Rehabilitation Specialist, (604) 451-6963.

### Grading

Minimum grade required to pass a course is 70 per cent. All courses must be passed in order to successfully complete the program.

### Normal Course Hours

Automotive ELTT 0700-1345 (first shift); 1000-1645 (second shift), Monday through Friday, shifts are assigned to specific intake dates. Direct inquiries to Registration and Information at (604) 434-1610 or send an e-mail to [services@bcit.bc.ca](mailto:services@bcit.bc.ca)

### T-TEP

0700-1345, Monday through Friday.

### Tuition Fees 1999/2000 (subject to change)

\$1225.10 for the 34-week full-time program.  
\$1686 for the Toyota sponsored program (lab fee of \$250 included).

### Books and Supplies 1999/2000

\$635 for both programs (general estimated cost and subject to change).

### Entrance Requirements

High school graduation. English 12 (C). Academic Math 11 (C). BCIT pretest is acceptable for English and Math. A valid driver's license that is acceptable for use in B.C. is required.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

### Fresh Start

This full-time technical literacy program provides academic upgrading in an applied setting for students wishing to enter a trades/technical program at BCIT.

For information about the Fresh Start program, please refer to page 51 of this calendar.

### Trades Discovery for Women

This full-time program is designed to prepare participants to successfully enter and complete a Trades Training program.

For information about the Trades Discovery for Women program, please refer to page 52 of this calendar.

### Program Content — Option 1

The Automotive ELTT standard program consists of the following course content and takes 34 weeks to complete.

Courses	Hours
AUTO 0010 Orientation	30
AUTO 1100 Use safe work practices	36
AUTO 1101 Solve mathematical problems	24
AUTO 1102 Apply science concepts	24
AUTO 1103 Process technical information	12
AUTO 1104 Basic measure/layout hand tools	30
AUTO 1105 Use power tools	12
AUTO 1106 Use fasteners and fittings	12
AUTO 1107 Lift loads	12
AUTO 1108 Oxyacetylene welding	18
AUTO 1109 Basic hydraulic systems	12
AUTO 1110 Use mechanics shop equipment	12
AUTO 1111 Operate gas-powered equipment	12
AUTO 1112 Describe mechanics trades	12
AUTO 1113 Service wheels, tires, hubs and bearings	24
AUTO 1114 Service suspension systems	48
AUTO 1115 Service steering systems	78
AUTO 1116 Service hydraulic brake systems	78
AUTO 1117 Perform gasoline engine major overhaul	6
AUTO 1119 Service transmissions	96
AUTO 1120 Service drive lines and drive axles	36
AUTO 1122 Service emission control systems	30
AUTO 1123 Prepare for employment	21
AUTO 1130 Service engine support systems	39
AUTO 1131 Service electrical systems	100
AUTO 1132 Service Ignition and Fuel Systems	86
<b>Total</b>	<b>898</b>

### Option 2

Toyota's Technical Education Program (T-TEP) is a Toyota Canada factory sponsored enriched program that adds additional Toyota specific courses to the existing Automotive ELTT Option 1 program. T-TEP is 40 weeks in duration including two work terms of two weeks each at a Toyota dealership.

Additional courses for the ELTT Automotive Mechanic Toyota T-TEP Program

Courses	Hours
ELTT Option	898
AUTO 1124 Electronics Fuel Injection	20
AUTO 1125 Diesel Engine	12
AUTO 1126 Body Electrical	18
AUTO 1127 Heater and A/C Systems	18
AUTO 1128 Work Experience	120
AUTO 1129 Service Transmission	118
<b>Total</b>	<b>1204</b>

### Instructors

David Huesken, T.Q., I.P., I.D., dhuesken@bcit.bc.ca  
Vito Ialungo, T.Q., I.D., vialungo@bcit.bc.ca  
Robert MacGregor, T.Q., I.P., I.D., Chief Instructor,  
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Gabor Retei, T.Q., I.P. (General Motors, ASEP),  
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Tim Wood, T.Q., I.P., twood@bcit.bc.ca  
Kelly McCutchin, T.Q., I.P., I.D., kmccutch@bcit.bc.ca

### Satellite Centres

Fabian Dododza, fdododza@bcit.bc.ca  
Sir Charles Tupper Centre  
Sandy Sudom, T.Q., I.P., I.D., B.Ed., ssudom@bcit.bc.ca  
New Westminster Centre  
Bryan Taylor, T.Q., I.P., I.D., bptaylor@bcit.bc.ca  
Maple Ridge Centre  
Gary Remenyk, T.Q., I.P., gremenyk@bcit.bc.ca

Share a ride - take the  
bus - ride your bike -  
walk - use the phone/  
computer/fax



## Automotive Service Technician

### Two-Year Cooperative Trades Training Diploma Program (Full-time)

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 motor vehicles, it is also for those with an interest in automotive, but who aspire to management positions in the industry.

In addition, the automotive industry needs skilled administrative personnel who have technical as well as business training, to manage the growing automotive service business.

The Automotive Service Technician (AST) program answers both of these needs.

#### Why this Training Program?

Students come to BCIT for state-of-the-art training delivered by trained 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 caliber of the trainees. Employers have expressed great interest in employing graduates of the AST program.

#### Salaries

Starting salaries for our graduates are in the range of \$8-12 per hour. AST graduates will go on to complete their apprenticeship training and, upon certification, they will earn approximately \$40,000 per year. Graduates can aspire to top industry positions with salaries in the \$60,000 plus range per year.

#### The Program

The AST program consists of three 18-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 two, 18-week co-op work terms in an automotive repair facility.

On successful completion of the program, students will receive an Automotive Service Technician Diploma and qualify for credit towards all four levels of apprenticeship schooling and two years credit toward the four year apprenticeship time service requirement.

#### 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 assist with job placements for students, it must be recognized that during

certain periods of the business cycle, job placements may be difficult 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 visit our cooperative training section on the Web.

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 at the Burnaby campus.

#### Program Length

Two years, full-time.

Level 1 - 18 weeks in school, 18 weeks co-op

Level 2 - 18 weeks in school, 18 weeks co-op

Level 3 - 18 weeks in school

#### Normal Course Hours

0700-1830, Monday through Friday.  
(subject to course scheduling)

#### Tuition Fees 1999/2000 (subject to change)

\$2451.80 for the two-year program.

#### Books and Supplies 1999/2000

\$1516 (general estimated cost and subject to change).

#### Entrance Requirements

High school graduation. English 12 (C). Academic Math 11 (C+). BCIT pretest is acceptable for English and Math. A valid driver's license 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 all program requirements have been met. Potential students with medical or physical disabilities should contact the Educational Resource Centre for Students with Disabilities to arrange an interview with the Institute's Rehabilitation Specialist at (604) 451-6963

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

## Fresh Start

This full-time technical literacy program provides academic upgrading in an applied setting for students wishing to enter a trades/technical program at BCIT.

For information about the Fresh Start program, please refer to page 51 of this calendar.

## Trades Discovery for Women

This full-time program is designed to prepare participants to successfully enter and complete a Trades Training program.

For information about the Trades Discovery for Women program, please refer to page 52 of this calendar.

## Program Content — Automotive Service Technician

Term 1		Credits	Hours
ASTP	1100 Math I	2.5	39
ASTP	1101 Physics I	2.5	39
ASTP	1102 Communications I	2.5	39
ASTP	1103 Drafting I	2.5	39
ASTP	1104 Shop Tools, Safety & Oxy/Acet	3.0	46
ASTP	1105 Wheel, Hubs & Tires	1.0	18
ASTP	1106 Frames & Suspension Systems	1.0	19
ASTP	1107 Steering Systems	3.5	50
ASTP	1108 Brake Systems	3.5	52
ASTP	1109 Intro to Electrical Systems	1.0	17
ASTP	1112 Maintenance & Inspection	2.0	32
ASTP	1114 General Shop Administration & Practice	2.5	38
ASTP	1115 Master Student	2.0	30
ASTP	1990 Co-op I	18.0	540
ASTP	2206 Drive Lines	1.0	15
ASTP	2207 Axles & Final Drives	1.5	20
ASTP	2212 Intro to Scan Tool	.5	8
ASTP	3301 Customer Relations & Sales	2.5	39
Term 2		Credits	Hours
ASTP	1110 Clutches & Manual Transmissions	2.5	40
ASTP	2200 Math 2	2.5	39
ASTP	2201 Physics 2	2.5	39
ASTP	2204 Gasoline Engines	7.0	105
ASTP	2205 Diesel Engines	1.0	15
ASTP	2208 Automatic Transmissions	3.5	55
ASTP	2209 Transfer Cases	1.0	15
ASTP	2990 Co-op 2	18.0	540
ASTP	3302 Fuel Management Systems	4.0	62
ASTP	3307 Ignition Systems	2.0	30
ASTP	3308 Tune Up & Emissions	5.0	72
ASTP	3310 Accounting Essentials	2.5	39
ASTP	4414 Oil/Fuel Chemistry	2.5	39

Term 3		Credits	Hours
ASTP	2202 Communications 2	2.5	39
ASTP	3304 Electrical Fundamentals	2.0	25
ASTP	3305 Starting Systems	1.5	20
ASTP	3306 Charging Systems	1.5	25
ASTP	3309 Air Conditioning	2.5	39
ASTP	3311 Automotive Computers	0.5	10
ASTP	3312 Alternate Fuel Controls	.5	7
ASTP	3313 CFC / 134a Retrofit	1.5	24
ASTP	4410 Business Fundamentals	2.5	39
ASTP	4411 Advanced Computer Controls	3.5	52
ASTP	4412 Electrical/Electronic Accessories	2.5	39
ASTP	4413 Alternate Fuels	2.5	39
ASTP	4415 Advanced Fuel Management Systems	10.0	143
ASTP	4417 Applied Business Practices	2.5	39

## Instructors

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Gary Remenyk, T.Q., I.P., Dawson Creek  
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Mike Thomas, T.Q., I.D., I.P., mthomas@bcit.bc.ca

## Commercial Transport Mechanic (Truck and Bus Mechanic)

### Certificate Program (Full-time)

Commercial transport mechanics overhaul, recondition, repair and maintain highway trucks, buses, forklifts 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.

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.

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## Commercial Transport Mechanic cont.

Because some heavy lifting is involved, good physical condition is desirable. Students must have a valid driver's license. Potential students with medical or physical difficulties should contact the Educational Resource Centre for Students with Disabilities to arrange an interview (telephone interview if out of town) with the Institute's Rehabilitation Specialist, (604) 451-6963.

### Grading

A minimum grade of 80 per cent is required to pass each course. All courses must be passed in order to successfully complete the program.

### Program Length

Full-time, 30 weeks.

### Normal Course Hours

0700-1345, Monday through Friday.

### Tuition Fees 1999/2000 (subject to change)

\$1084.50 for the 30-week full-time program.

### Books and Supplies 1999/2000

\$724 (general estimated cost and subject to change).

### Entrance Requirements

High school graduation. English 12 or Communications 12. Any Math course at the grade 11 level. BCIT pretest is acceptable for English and Math.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

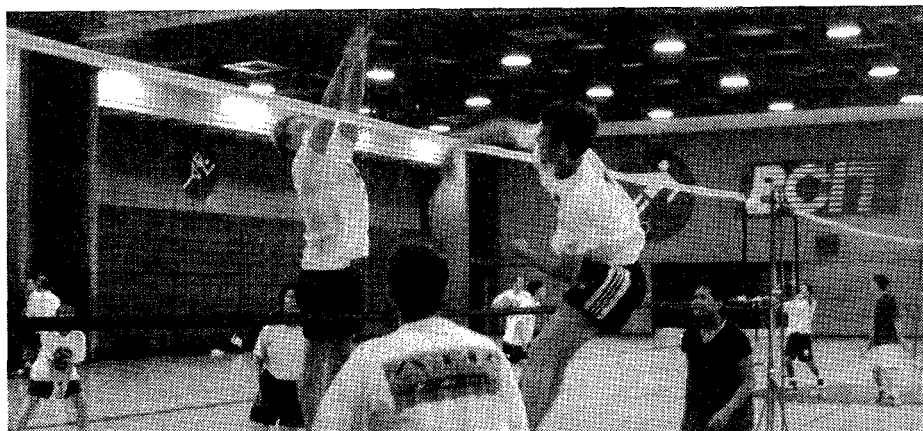
For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

## Program Content — Commercial Transport Mechanic

Courses	Hours
CTMX 1100 Describe Mechanical Trade	6
CTMX 1101 Solve Mathematical Problems	12
CTMX 1102 Describe and Use Safe Work Practices	30
CTMX 1103 Technical Communications	6
CTMX 1104 Apply Science Concepts	12
CTMX 1105 Electrical Principles and Practice I	20
CTMX 1106 Start Run Move Shut Down Equipment	30
CTMX 1107 Mechanic's Hand Tools Measuring Tools	30
CTMX 1108 Describe and Use Mechanic's Power Tools	24
CTMX 1109 Describe and Service Hydraulic Systems	90
CTMX 1110 Oxyacetylene Welding	18
CTMX 1111 Arc Welding	12
CTMX 1112 Lifting and Blocking	30
CTMX 1113 Overhaul Internal Combustion Engines	90
CTMX 1114 Describe & Service Engine Support Systems	60
CTMX 1115 Power Transfer Systems	60
CTMX 1116 Service Standard Transmissions	12
CTMX 1117 Describe and Service Clutch Brakes	18
CTMX 1118 Describe and Service Steering Systems	84
CTMX 1119 Describe and Service Frames, Suspensions	60
CTMX 1120 Describe and Service Hydraulic Brake Systems	60
CTMX 1121 Describe and Service Air Brake Systems	48
CTMX 1122 Service Air Operated Controls/Accessories	30
CTMX 1123 Prepare for Employment	18

### Instructors

Peter Congdon, I.D., Com.Trans. I.P., Auto I.P., Chief Instructor,  
pcongdon@bcit.bc.ca  
Daren Germaine, Com. Trans. I.P.  
Douglas Schmelzel, I.D., Com. Trans. T.Q., H.D. I.P.  
Larry Strong, I.D., Auto. I.P., Com.Trans., I.P.  
Keith Whitter, I.D., Com. Trans. T.Q., Auto I.P.



## Diesel Electronics

### Certificate Program (Full-time)

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 and is 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.

### Grading

Minimum passing grade in each course is 70 per cent. An overall average of 70 per cent is required to successfully complete the program.

### Program Length

Full-time, 10 weeks.

### Normal Course Hours

0700-1345, Monday through Friday.

### Tuition Fees 1999/2000 (subject to change)

\$351.50 for the 10-week full-time program.

### Books and Supplies 1999/2000

\$386 (general estimated cost and subject to change).

### Entrance Requirements

High school graduation. English 12 or Communications 12. Any Math course at the grade 11 level. BCIT pretest is acceptable for English and Math. Applicants must possess: 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, or one of ELTT Diesel Mechanics, ELTT Commercial Transport or ELTT Heavy Duty Mechanics.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

### Program Content — Diesel Electronics

Courses	Hours
DELX 2100 Electrical Advanced I	60
DELX 2101 Electrical Advanced II	60
DELX 2102 Detroit Diesel Electronic Control (DDEC)	60
DELX 2103 Caterpillar Electronic Control	60
DELX 2104 Cummins Electronics Control (Celect)	60
<b>Total</b>	<b>300</b>

### Instructors

Daren Germaine, I.D., Com. Trans. I.P.

Keith Whitter, I.D., Com. Trans. T.Q., Auto I.P.

## Diesel Engine Mechanic

### Certificate Program (Full-time)

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. This program meets the entrance requirements of the BCIT Marine Engineering program.

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.

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## Diesel Engine Mechanic cont.

Because some heavy lifting is involved, good physical condition is desirable. Potential students with medical or physical difficulties should contact the Educational Resource Centre for Students with Disabilities to arrange an interview (telephone interview if out of town) with the Institute's Rehabilitation Specialist, (604) 451-6963.

### Grading

Minimum passing grade in each course is 80 per cent.

### Program Length

Full-time, 42 weeks, beginning in September each year.

### Normal Course Hours

0700-1345, Monday through Friday.

### Tuition Fees 1999/2000 (subject to change)

\$1506.30 for the 42-week full-time program.

### Books and Supplies 1999/2000

\$717 (general estimated cost and subject to change).

### Entrance Requirement

High school graduation. English 12 or Communications 12. Any Math course at the grade 11 level. BCIT pretest is acceptable for English and Math.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

### Fresh Start

This full-time technical literacy program provides academic upgrading in an applied setting for students wishing to enter a trades/technical program at BCIT.

For information about the Fresh Start program, please refer to page 51 of this calendar.

### Trades Discovery for Women

This full-time program is designed to prepare participants to successfully enter and complete a Trades Training program.

For information about the Trades Discovery for Women program, please refer to page 52 of this calendar.

## Program Content — Diesel Engine Mechanic

Courses	Hours
DEMX 1100 Describe Mechanical Trades	6
DEMX 1101 Solve Mathematical Problems	20
DEMX 1102 Describe and Use Safe Work Practices	30
DEMX 1103 Technical Communications	10
DEMX 1104 Apply Science Concepts	15
DEMX 1106 Start Run Move Shut Down Equipment	15
DEMX 1107 Mechanic's Hand and Measuring Tools	30
DEMX 1108 Describe and Use Mechanic's Power Tools	30
DEMX 1109 Describe and Service Hydraulic Systems	18
DEMX 1110 Oxyacetylene Welding	18
DEMX 1111 Arc Welding	12
DEMX 1112 Lifting and Blocking	24
DEMX 1113 Overhaul Internal Combustion Engines	60
DEMX 1114 Engine Support Systems	150
DEMX 1115 Service Cylinder Block Assemblies 150	
DEMX 1116 Service Engine Support Systems	135
DEMX 1117 Electrical Systems/Components	150
DEMX 1118 Emission Control Problems	60
DEMX 1119 Describe Diesel Fuel Systems	30
DEMX 1120 Service Diesel Fuel Systems	150
DEMX 1121 Troubleshoot Diesel Engines	120
DEMX 1122 Marine Gear	15
DEMX 1123 Prepare for Employment	12
<b>Total</b>	<b>1260</b>

### Instructors

Paul Ehni, I.D., H.D.I.P.

Tom Kozar, I.D., H.D.I.P., Com. Trans. T.Q.

## Heavy Duty Mechanic

### Certificate Program (Full-time)

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 license. Good physical condition is desirable. Potential students with medical or physical difficulties should contact the Educational Resource Centre for Students with Disabilities to arrange an interview (telephone interview if out of town) with the Institute's Rehabilitation Specialist, (604) 451-6963.

## Grading

A minimum course grade of 80 per cent is required to achieve a passing grade.

## Program Length

Full-time, 30 weeks.

## Normal Course Hours

0700-1345, Monday through Friday.

## Tuition Fees 1999/2000 (subject to change)

\$1084.50 for the 30-week full-time program.

## Books and Supplies 1999/2000

\$519 (general estimated cost and subject to change).

## Entrance Requirement

High school graduation. English 12 or Communications 12. Any Math course at the grade 11 level. BCIT pretest is acceptable for English and Math.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

## Fresh Start

This full-time technical literacy program provides academic upgrading in an applied setting for students wishing to enter a trades/technical program at BCIT.

For information about the Fresh Start program, please refer to page 51 of this calendar.

## Trades Discovery for Women

This full-time program is designed to prepare participants to successfully enter and complete a Trades Training program.

For information about the Trades Discovery for Women program, please refer to page 52 of this calendar.

## Program Content — Heavy Duty Mechanic

Courses	Hours
HDMX 1200 Use Safe Work Practices	30
HDMX 1201 Describe Mechanical Trades	10
HDMX 1202 Process Technical Information	60
HDMX 1203 Use Hand Tools and Shop Equip	60
HDMX 1204 Lift Loads	30
HDMX 1205 Use Fastenings and Fittings	40
HDMX 1206 Cut/Weld/Braze and Solder Mtls	30
HDMX 1207 Operate Powered Equipment	30
HDMX 1208 Service Winches/Working Attach	30
HDMX 1209 Service Brake Systems	30
HDMX 1210 Service Hydraulic Systems	30
HDMX 1211 Overhaul Diesel Engines	60
HDMX 1212 Select Lubricants and Fluids	20
HDMX 1213 Service Engine Support Systems	30
HDMX 1214 Gas and Alternate Fuel Systems	30
HDMX 1215 Service Diesel Fuel Systems	20
HDMX 1216 Service Elec/Electronic Systems	60
HDMX 1217 Service Drive Axles and Lines	60
HDMX 1218 Service Std Transmission Lines	30
HDMX 1219 Service Automatic/Powershift	30
HDMX 1285 Service Bearings and Seals	30
HDMX 1221 Service Track Type Equipment	60
HDMX 1222 Service Wheel Type Equipment	90
<b>Total</b>	<b>900</b>

## Instructors

Helena Balaban, I.D., H.D.I.P., T.Q.  
 Philip Janzen, I.D., H.D.I.P.  
 Douglas Schmelzel, H.D.I.P., Com. Trans. T.Q., I.D.  
 Edward Wilk, I.D., H.D.I.P.

## Inboard/Outboard Mechanic

### Certificate Program (Full-time)

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.

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## Inboard/Outboard Mechanic cont.

### 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.

### The Program

This program is delivered in an individual study format. 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 the Educational Resource Centre for Students with Disabilities to arrange an interview (telephone interview if out of town) with the Institute's Rehabilitation Specialist, (604) 451-6963.

### Grading

Minimum course passing grade is 80 per cent.

### Program Length

Full-time, 34 weeks, with intakes every three months starting in January.

### Normal Course Hours

0700-1400, Monday through Friday.

### Tuition Fees 1999/2000 (subject to change)

\$1225.10 for the 34-week full-time program.

### Books and Supplies 1999/2000

\$507 (general estimated cost and subject to change).

### Entrance Requirement

High school graduation. English 12 or Communications 12. Any Math course at the grade 11 level. BCIT pretest is acceptable for English and Math.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

### Fresh Start

This full-time technical literacy program provides academic upgrading in an applied setting for students wishing to enter a trades/technical program at BCIT.

For information about the Fresh Start program, please refer to page 51 of this calendar.

### Trades Discovery for Women

This full-time program is designed to prepare participants to successfully enter and complete a Trades Training program.

For information about the Trades Discovery for Women program, please refer to page 52 of this calendar.

### Program Content — Inboard/Outboard Mechanic

Courses	Hours
CORE 1100 Use Safe Work Practices	30
CORE 1101 Solve Mathematical Problems	24
CORE 1102 Apply Science Concepts	12
CORE 1103 Use Hand and Shop Tools	30
CORE 1104 Use Fasteners and Fittings	20
CORE 1105 Use Resources Related to the Trade	30
CORE 1106 Service Internal Combustion Engines	30
CORE 1107 Apply Principles of Lubrication	22
CORE 1108 Perform Welding, Cutting and Brazing	30
CORE 1109 Basic Electrical Systems	30
CORE 1110 Prepare for Employment	12
IOMX 1101 Describe the Mechanics Trade	3
IOMX 1112 Lift Loads	12
IOMX 1113 Service Outboard Engines	90
IOMX 1114 Service Inboard Engines	48
IOMX 1115 Engine Support Systems	72
IOMX 1117 Marine Electrical Systems	145
IOMX 1118 Inboard/Outboard Power Systems	147
IOMX 1119 Remote Control Systems	24
IOMX 1120 Tilt and Trim Systems	48
IOMX 1121 Tune-ups and Rebuilds	84
IOMX 1122 Outboard and In/Outboard Instl 77	
<b>Total</b>	<b>1020</b>

### Instructors

Brian Hanna, I.D., T.Q.

Jeff Mica, I.D., T.Q.

## Motorcycle Mechanic

### Certificate Program (Full-time)

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 rebuilds, electrical component repair and chassis, wheel, suspension, final drive and accessory service.

### Job Opportunities

Training prepares students for entry-level employment as motorcycle service technicians.

The industry demands qualified technicians due to the increasing sophistication of 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

This program is delivered in an individual study format. 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 the Educational Resource Centre for Students with Disabilities to arrange an interview (telephone interview if out of town) with the Institute's Rehabilitation Specialist, (604) 451-6963.

### Grading

Minimum grade required to pass a course is 80 per cent.

### Program Length

Full-time, 34 weeks, with intakes every three months starting in January.

### Normal Course Hours

0700-1400, Monday through Friday.

### Total Tuition 1999/2000 (subject to changes)

\$1225.10 for the 34-week full-time program.

### Books and Supplies 1999/2000

\$515 (general estimated cost and subject to change).

### Entrance Requirement

High school graduation. English 12 or Communications 12. Any Math course at the grade 11 level. BCIT pretest is acceptable for English and Math.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

### Fresh Start

This full-time technical literacy program provides academic upgrading in an applied setting for students wishing to enter a trades/technical program at BCIT.

For information about the Fresh Start program, please refer to page 51 of this calendar.

### Trades Discovery for Women

This full-time program is designed to prepare participants to successfully enter and complete a Trades Training program.

For information about the Trades Discovery for Women program, please refer to page 52 of this calendar.

### Program Content — Motorcycle Mechanic

Courses	Hours
CORE 1100 Use Safe Work Practices	30
CORE 1101 Solve Mathematical Problems	24
CORE 1102 Apply Science Concepts	12
CORE 1103 Use Hand and Shop Tools	30
CORE 1104 Use Fasteners and Fittings	20
CORE 1105 Use Resources Related to the Trade	30
CORE 1106 Service Internal Combustion Engines	30
CORE 1107 Apply Principles of Lubrication	22
CORE 1108 Welding, Cutting and Brazing	30
CORE 1109 Basic Electrical Systems	30
CORE 1110 Prepare for Employment	12
MCMX 1112 Two and Four Cycle Top End Service	78
MCMX 1114 Power Transmissions	90
MCMX 1116 Electrical Systems	90
MCMX 1117 Fuel Delivery Systems	75
MCMX 1118 Final Drive Service	24
MCMX 1119 Brake Systems	27
MCMX 1120 Wheels and Tires	30
MCMX 1121 Frame and Suspension Systems	36
MCMX 1122 Selected Service Procedures	300
<b>Total</b>	<b>1020</b>

### Instructors

Tom Nelson, Dipl. Tech., T.Q., Chief Instructor,  
tnelson@bcit.bc.ca

## Power Equipment Mechanic

### Certificate Program (Full-time)

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 can 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

This program is delivered in an individual study format. 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 the Educational Resource Centre for Students with Disabilities to arrange an interview (telephone interview if out of town) with the Institute's Rehabilitation Specialist, (604) 451-6963.

### Grading

Minimum grade required to pass a course is 80 per cent.

### Program Length

Full-time, 34 weeks, with intakes every three months starting in January.

### Normal Course Hours

0700-1400, Monday through Friday.

### Tuition Fees 1999/2000 (subject to change)

\$1225.10 for the 34-week program.

### Books and Supplies 1999/2000

\$598 (general estimated cost and subject to change).

### Entrance Requirements

High school graduation. English 12 or Communications 12. Any Math course at the grade 11 level. BCIT pretest is acceptable for English and Math.

**Note:** Applied Academics courses taught in B.C. high schools are acceptable as entrance requirements for BCIT programs. Applied Academics courses include: Technical and Professional Communications 12, Principles of Math 11 and 12, Applications of Math 11 and 12, Applications of Physics 11 and 12, Information Technology 11 and 12.

For information on specific Applied Academics course equivalencies as they relate to entrance requirements for your chosen program, please contact your high school counsellor or BCIT Registration and Information at (604) 434-1610.

### Fresh Start

This full-time technical literacy program provides academic upgrading in an applied setting for students wishing to enter a trades/technical program at BCIT.

For information about the Fresh Start program, please refer to page 51 of this calendar.

### Trades Discovery for Women

This full-time program is designed to prepare participants to successfully enter and complete a Trades Training program.

For information about the Trades Discovery for Women program, please refer to page 52 of this calendar.

### Program Content — Power Equipment Mechanic

Courses	Hours
CORE 1100 Use Safe Work Practices	30
CORE 1101 Solve Mathematical Problems	24
CORE 1102 Apply Science Concepts	12
CORE 1103 Use Hand and Shop Tools	30
CORE 1104 Use Fasteners and Fittings	20
CORE 1105 Use Resources Related to the Trade	30
CORE 1106 Service Internal Combustion Engines	30
CORE 1107 Apply Principles of Lubrication	22
CORE 1108 Welding, Cutting and Brazing	30
CORE 1109 Basic Electrical Systems	30
CORE 1110 Prepare for Employment	12
PEMX 1110 Service Four Stroke Engines	60
PEMX 1111 Service Two Stroke Engines	60
PEMX 1112 Maintain and Repair Fuel Systems	60
PEMX 1113 Maintain and Repair Cooling Systems	11
PEMX 1114 Repair Electrical Systems	60
PEMX 1115 Repair Charging Systems, Electrical Motors	58
PEMX 1116 Repair Power Transfer Systems	90
PEMX 1117 Repair Chassis and Brake Systems	45
PEMX 1118 Selected Service Procedures	306
<b>Total</b>	<b>1020</b>

### Instructors

Bob Miller, B.Ed., Dipl. Tech., T.Q.

## Pacific Marine Training Campus

In December 1994 the Pacific Marine Training Institute merged with the British Columbia Institute of Technology to become the Pacific Marine Training Campus of BCIT. The Pacific Marine Training Campus (PMTC) is located on the North Shore of Vancouver Harbor, 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 harbor, 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 harbor.

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.

Some programs are under curriculum review, please contact PMTC at (604) 985-0622 or Registration and Information at (604) 434-1610 to verify program content.

### Job Opportunities

The diverse Canadian marine industry offers many challenging and some rewarding career opportunities. Qualified men and women may 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 has been 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 Department of Fisheries and Oceans/Canadian Coast Guard vessels, 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. (For further information about courses related to this sector of the industry please refer to the Shipping and Marine Operations Certificate program in the Part-time Studies Flyer or on-line at [www.bcit.bc.ca](http://www.bcit.bc.ca)).

### Certification and Diplomas Nautical and Engineering Certificates

Transport Canada 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 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 Transport Canada. 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.

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## Pacific Marine Training Campus cont.

Information regarding sea service requirements may be obtained by contacting either the Nautical Examiner, or the Marine Engineer Examiner, at one of the following Transport Canada Ship Safety Branches:

District Surveyor Transport Canada Ship Safety  
Suite 620-800 Burrard Street  
Vancouver, B.C. V6Z 2J8  
Telephone: (604) 666-0834

District Surveyor Transport Canada Ship Safety  
501-1230 Government St  
Victoria, B.C. V8W 1Y3  
Telephone: (250) 363-0299

District Surveyor Transport Canada Ship Safety  
Room 101-A, 60 Front Street  
Nanaimo, B.C. V9R 5H7  
Telephone: (250) 754-0244

District Surveyor Transport Canada Ship Safety  
Seal Cove Coast Guard Base  
P.O. Box 3670  
Prince Rupert, B.C. V8J 3R1  
Telephone: (250) 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 and Marine Emergency Duties.

Any students intending to pursue a career at sea should undergo a medical examination and a color perception test. Candidates should obtain a copy of the general application form from a Transport Canada Ship Safety Office, and make the necessary arrangements with a general practitioner or eye specialist for an examination.

### 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 Transport Canada examinations if the person qualifies for entrance to the examination. Transport Canada 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.

## Deckhand Training Program

### MSSM 1020 Deckhand Training Program

(program under review: to be replaced by Bridge Watchman Program in January 1999)

Responds 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 emphasise the following areas: marine safety and survival, general seamanship, watch-keeping, and teamwork abilities. The course is approved by Transport Canada, 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 working vessel.

### Entrance Requirements

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 Transport Canada specifications.

### Sea Service Requirement

None.

## Course Content — Deckhand Training Program

**Ships** Introduces terminology; crew organization; duties; ship construction; cargo handling gear.

**Mooring Systems** Covers 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** Presents rust protection and painting; shipboard housekeeping; equipment upkeep; rope, wire and towing gear maintenance; pollution prevention.

**Bridge Watchkeeping** Teaches steering; lookout; communication equipment; Canadian Buoyage System; navigational aids; rules of the road; charts, and chart symbols.

**Marine Emergency Duties** Introduces hazards and emergencies; lifesaving appliances; drills and signals; survival; fire fighting; first aid; rescue.

## 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.

**ENAV 1000 Simulated Electronic Navigation I (SEN I): Part A — Navigating Instruments** Introduces navigating instruments for junior bridge officers. It is a Transport Canada approved course and is a prerequisite for the SEN I part B: Basic Radar Simulator Course. PMTC is authorized to issue a Transport Canada Training Certificate upon successful completion of this course.

### Course Length

Four weeks.

### Prerequisites

The 041 Chartwork and 061 Navigation Safety courses must be successfully completed prior to the SEN I. Student must also hold an Industry Canada Restricted Operator's Certificate (ROC). It is the responsibility of the student to ensure they comply with Transport Canada regulations.

### 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.

**ENAV 1050 Simulated Electronic Navigation I (SEN I): Part B Basic Radar Simulator Course —** Presents this Transport Canada approved practical exercise course on the radar simulator. It is required for the Watchkeeping Mate Certificate of Competency. PMTC is authorized to issue a Transport Canada Training Certificate upon successful completion of the course. Following the last day of the course, a practical examination (SIM 1) is conducted by a Transport Canada examiner.

### Course Length

13 days (includes 1 day for SIM 1 examination).

### Entrance Requirements

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.

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## Electronic Navigation Courses cont.

### ENAV 2000 Simulated Electronic Navigation II (SEN II):

— **Advanced Radar Simulator Course** Allows participants to perform and supervise individual bridge duties as Master in charge of a vessel. It is a Transport Canada approved course, and is a requirement for any certificate of competency with command validity. PMTC is authorized to issue a Transport Canada Training Certificate upon successful completion of the course. On the last day of the course, a practical examination (SIM 2) is conducted by a Transport Canada examiner.

#### Course Length

15 days (includes one day for SIM 2 examination).

#### Entrance Requirements

SEN I parts A and B. Industry Canada ROC Certificate. It is the responsibility of the student to ensure they comply with Transport Canada requirements.

#### Course Content

Teaches students to navigate safely and plot effectively using all available navigational aids, including analog radar, ECDIS, 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.

### ENAV 3000 Automatic Radar Plotting Aids (ARPA) —

Provides specialized training in use of ARPA. It is a Transport Canada approved course, and is a requirement for any bridge watchkeeping officer navigating a vessel equipped with ARPA radar. PMTC is authorized to issue a Transport Canada Training Certificate upon successful completion of the course.

#### Course Length

Five days.

#### Entrance Requirements

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.

#### Instructors

R. Goeller, [rgoeller@bcit.bc.ca](mailto:rgoeller@bcit.bc.ca)  
T. Noack, [tnoack@bcit.bc.ca](mailto:tnoack@bcit.bc.ca)  
M. Rudrakumar, [mrudraku@bcit.bc.ca](mailto:mrudraku@bcit.bc.ca)

## Fishing Industry Programs

### Fishing Master Class IV

Prepares candidates for Transport Canada 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

Seven weeks

#### Entrance Requirements

None.

#### Sea Service Requirements

12 months.

#### Program Content

NAUT 0020 020 Navigating Instruments  
NAUT 0040 040 Chartwork and Pilotage  
NAUT 0061 061 Navigation Safety  
NAUT 0166 166 General Seamanship

**Note:** Entrance to the final Transport Canada examination is conditional on the candidate producing the following certificates:

- Marine Emergency Duties A-I
- Restricted Radio Operator's Certificate
- Standard First Aid

The MED A-I, Radio Operator's Certificate, and Standard First Aid are not included, and must be enrolled separately.

Course offering is subject to enrolment. The course may be amalgamated with Fishing Master III. For details of course availability and / or requirements, please contact PMTC registration at (604) 985-2862.

### Fishing Master Class III

Prepares the participant for Transport Canada 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.

#### Entrance Requirements

None.

#### Sea Service Requirement

24 months.



## Course Content

NAUT 0011 011 Communications  
 NAUT 0020 020 Navigating Instruments  
 NAUT 0041 041 Chartwork and Pilotage  
 NAUT 0061 061 Navigation Safety  
 NAUT 0157 157 General Ship Knowledge  
 NAUT 0167 167 General Seamanship

**Note:** Entrance to the final Transport Canada examination is conditional on the candidate producing the following certificates:

- Marine Emergency Duties A-I
- Restricted Radio Operator's Certificate
- Standard First Aid
- The MED A-I, Radio Operator's Certificate, and Standard First Aid are not included with this program, 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 Transport Canada examinations leading to the issuance of the Fishing Master I and II Certificates of Competency. However, some assistance is 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.

## Global Maritime Distress and Safety System (GMDSS)

**GMDS 1000** The GMDSS was developed by the International Maritime Organization (IMO) and put in force on February 1, 1992 under the Safety of Life at Sea (SOLAS) Convention amendments. The new system of communication is now being phased in gradually, with full compliance to be implemented on February 1, 1999. The new GMDSS is intended to provide a more efficient search and rescue system using both satellite and terrestrial radio communication. The basic concept of this system is to allow search and rescue authorities ashore - as well as those on board a vessel in the immediate vicinity of any ship in distress - to be rapidly alerted to the distress incident, allowing for a coordinated search and rescue operation to commence with a minimum delay. The GMDSS also provides for urgency and safety communications and dissemination of maritime safety information, including navigational and meteorological warnings.

The radio equipment for the GMDSS that a vessel must carry is defined according to the area of ship operation, and includes the following:

- VHF/MF/HF Digital Selective Calling (DSC)
- Navtex
- Satellite Emergency Position-Indicating Radio Beacons (EPIRB)
- Search and Rescue Radar Transponders (SART)
- Satellite communication equipment: INMARSAT A and C - Ship to Earth Station (SES)
- Two-way hand-held VHF Radiotelephone.

Canada is a member of the International Telecommunication Union, an organization established to regulate the spectrum by providing basic standards for communication procedures and practices on a worldwide basis, and minimum standards that candidates must meet to obtain the various classes of radio operator's certificates. Canada is also a member of the International Maritime Organization (IMO), which is responsible for marine equipment, operations and training, especially concerning safety at sea.

To bring the Canadian certificates in line with changes in the international requirements, Industry Canada (formerly Department of Communications), in collaboration with Transport Canada, has established the following marine radio-communication certificates:

1. First Class Radio Electronic Certificate
2. General Operator's Certificate (GOC)
3. Restricted Operator's Certificate (ROC)

The first certificate is reserved for professional electronics and marine radio operators while the remaining two are applicable to ship's personnel. Generally speaking, ships that are fitted with VHF radiotelephones must carry persons who hold a Restricted Operator's certificate, and ships that are fitted with MF or MF/HF radiotelephones, or Ship to Earth Stations (SES), must carry persons who hold General Operator's Certificate.

The introduction of GMDSS into commercial shipping is now mandatory on all newly constructed vessels over 300 tonnes on international voyages, and by 1999 becomes mandatory on all vessels over 300 tonnes. Most internationally operating companies are currently demanding that deck and often engineer officers must hold a GMDSS General Operators Certificate (GOC) as a condition of employment.

## Course Certification

Graduates will receive a General Operators Certificate (GOC) issued by Industry Canada. Examination will be offered by PMTC to standards approved by Industry Canada and the European Communications Electronic Postal Telegraph (CEPT) which are the standards currently required by international ship operators.

## Program Length

Two weeks.

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## Global Maritime Distress and Safety System (GMDSS) cont.

### Entrance Requirements

Candidates for the GMDSS certification should be deck, engine room officers, or senior rating with extensive bridge experience. It is essential that candidates are familiar with computers and have keyboarding skills.

### Program Content

#### Maritime Mobile and Satellite Services

- Features of the Maritime Mobile Service
- Features of the Maritime Satellite Service

#### Basic Equipment of a Ship Station Practical use of the basic equipment of a ship station including:

- Watchkeeping receivers, VHF radio installations, antennas, batteries, and survival craft radio equipment.
- Digital Selective Calling (DSC) including the call format specifier, call address selection with the MMSI number system, call categorization, and call telecommand and traffic information.
- Knowledge and ability to use the Maritime NBDF and TOR equipment.
- Knowledge and ability to use the INMARSAT systems.

#### Procedures and Practical Operation of the GMDSS System

- INMARSAT A and C systems, INMARSAT EGC.
- Navtex, Emergency Position Indicating Radio Beacons (EPIRB), and Search and Rescue Transponders (SART).

#### Distress, Urgency and Safety Communications Procedures

- Knowledge of the receipt, acknowledgment and handling of a DSC distress alert.
- Knowledge of urgency and safety communications procedures.
- Communications by radiotelephony with stations on the old distress and safety system.
- Reception of Maritime Safety Information (MSI).
- Protection of distress frequencies.
- Search and Rescue (SAR) operations.

#### Operational Skills and Procedures for General Communications

- Use of International Code of Signals and phonetic alphabet
- Theory and practice of general communications procedures

## Marine Engineering Programs

The Pacific Marine Training Campus offers a variety of programs that prepare students for Transport Canada examinations. Each program consists of a number of courses preparing students to write examinations leading to Certificates of Competency issued by Transport Canada.

- Marine Engineering Officer (Co-op Program)
- 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 Transport Canada oral examination are provided. These are for general information purposes only, and are not intended to replace the specific Transport Canada 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 Transport Canada Marine Engineering Examination Centre. All decisions regarding eligibility and assessment of sea service are made by the Transport Canada Examiner.

Students planning to do the final oral examinations for Transport Canada Certificates of Competency must also hold the appropriate level of Marine Emergency Duties (MED) training and Standard First Aid Certification as required by Transport Canada 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 Transport Canada Examination Centre.

As of September 1, 1994, all candidates for Marine Engineering Certificates of Competency are also required to complete Propulsion Plant Simulator Training prior to obtaining their certificate. Marine Engineer Officers currently holding Certificates of Competency may obtain a Continued Proficiency Certificate (CPC) only after providing proof of Simulator Training, or by successfully challenging the Transport Canada assessment exercise. Please refer to the section titled Propulsion Plant Simulator Training for more information.

Some of the Marine Engineering courses have been accredited with Transport Canada, which means that successful completion of course material will exempt students from the Transport Canada 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.

## Marine Engineering Officer

### Cooperative Education Officer Cadet Diploma Program (Four year, Full-time/ 18 months of Sea-time)

The marine industry in Canada and the rest of the world depend on the services of internationally certificated Marine Engineers. These are professionals trained in the running and maintenance of the propulsion plant and other machinery systems found in all ocean-going ships.

A Marine Engineer employed on a ship is responsible for the efficient operation and maintenance of the vessel's propulsion, electrical and auxiliary systems. The main activities of the Marine Engineer include carrying out daily watch-keeping and repairs to the machinery systems; planning and performing long-term machinery maintenance schedules. Marine Engineers carry out these duties in full compliance with international standards with regards operational safety and pollution prevention of the sea.

### Job Opportunities

The Baltic and International Marine Council, one of the most prestigious shipping councils based in the United Kingdom, recently released its report that indicates that the shipping industry world wide currently faces an officer shortage of 18,000 to 20,000 officers. This figure is expected to grow to over 40,000 by the year 2005, as the current generation of sea going officers retire.

The career as an Engineer Officer is both interesting and rewarding. Salaries for senior engineer officers are high by Canadian standards. Officers may serve on a variety of international or domestic vessels, where opportunity for advancement, for the foreseeable future, is very good.

### The Program

This Marine Engineering Officer Diploma is a co-operative Officer Cadet program between BCIT and the domestic and international shipping industry. Cadets participating in the program will be selected by BCIT for academic suitability and then interviewed by participating shipping companies to ensure the applicant meets the company's employment requirements. Cadets will be required to support themselves financially while studying at BCIT, but will receive a stipend while serving at sea, with their living, travel and other expenses covered by the host shipping company. The graduates from the program will be awarded a Marine Engineering Officer Diploma from BCIT. Canadian citizens and Canadian landed immigrants will also, upon completion of all prerequisites, receive a Third Class Canadian Marine Engineer Certificate of Competency as issued by Transport Canada as well as the part A of their Second Class Canadian Marine Engineer Certificate of Competency.

The program provides Officer Cadets with a good background in the principles of construction, operation and maintenance of diesel engine propulsion plants on ships. The program will provide the knowledge the Officer Cadets require to write the Department of Transport examinations up to the First Class Certificate level. Graduates of the program will be permitted to write the Part A of the First Class Canadian Marine Engineers Certificate of Competency within 90 days of graduation.

This is a four-year program. The initial year incorporates a "hands on" Diesel Engine Mechanic program at the BCIT Burnaby campus. Additionally, First Aid training and Marine Emergency Duties training will be undertaken at BCIT's Pacific Marine Training Campus in North Vancouver and the Justice Institute campus. Following this, the cadet will serve the first of their six month periods of sea training with his/her sponsoring company. He/she will then return to BCIT's Pacific Marine Training Campus to begin the first of three academic semesters. Sandwiched between these semesters are two further six month periods of sea service. Before embarking on the third period of sea service, those cadets meeting the academic and sea service requirements will qualify for their 4th Class Canadian Marine Engineer Certificate of Competency. It is anticipated the Cadet will then be given the opportunity to serve as an assistant or as an officer in charge of engine room watch.

While at sea, Cadets will be required to undertake assigned project work as determined by their sponsoring company.

### Program Length

Overall: Four years.

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## Marine Engineering Officer cont.

### Program Fees (subject to change):

Fees are estimates only.

Year One \$ 2,432

Year Two 1,273

Year Three 1,653

Year Four 1,257

**Total \$ 5,342**

### Books and Supplies (subject to change)

**Estimated at \$700 per year.**

The Officer Cadets must equip themselves with drawing instruments, a scientific calculator and such other materials as they may require. They must also provide themselves with overalls, safety hearing protection, safety goggles and safety boots for use in workshops.

### Accreditation

This program exceeds the standards set out for Marine Engineer Certification as set out by Transport Canada.

### Entrance Requirements

1. High School Graduation. English 12 (C). Academic Math 12 (C). One of Chemistry 11 (C), Physics 11 (C), or Applied Physics 12 (C).
2. The candidate must successfully pass, to Transport Canada standards, a medical, hearing, and eyesight test. This test must be conducted by a Transport Canada approved Doctor. Information regarding how to arrange for this test will be forwarded after an application form has been received by the BCIT Admissions department. Please note that you are responsible for any fee charge by the Doctor for conducting this test and providing BCIT with official results.
3. Candidates will be required to sign a waiver as a condition of acceptance.
4. Once candidates have provided the BCIT Admissions department with the information outlined in 1, 2, and 3 above, they will have their name entered onto a "complete" list. This list plus the candidates application form, transcripts, and medical test results, will then be circulated to BCIT's participating Co-operative shipping company partners who will select, or reject, those applicants as meet the corporate profile of the shipping company. A specific shipping company may require medical tests at a higher level than those required by Transport Canada. Acceptance by a shipping company is a condition of acceptance into the Marine Engineering Officer program.

### Graduation

Officer Cadets will receive a "Diploma in Trades Training in Marine Engineering: Marine Engineering Officer" from BCIT upon graduation from the Program. At this time they will write their 3<sup>rd</sup> Class Engineering Knowledge and Oral Examinations

set by Transport Canada and, if successful, will receive their Canadian Third Class Marine Engineer Certificate of Competency. Graduates will also receive an academic waiver for the part A examinations of the Canadian 2<sup>nd</sup> Class Marine Engineer Certificate of Competency. In addition, graduates, within 90 days of graduation, may sit the Part A examinations of the Canadian 1<sup>st</sup> Class Marine Engineer Certificate of Competency.

### Program Content

The curriculum for this program is presently under development and is subject to change.

#### Year one: ( 66 weeks/ 40 wks. education and 26 wks coop)

Courses	Hours	Credits
DEMEX 1100 Describe Mechanical Trades	6.0	0.5
DEMEX 1101 Solve Mathematical Problems	20.0	1.0
DEMEX 1102 Describe and Use Safe Work Practices	30.0	2.0
DEMEX 1103 Technical Communications	10.0	0.5
DEMEX 1104 Apply Science Concepts	15.0	1.0
DEMEX 1106 Start Run Move Shut Down Equipment	15.0	1.0
DEMEX 1107 Mechanic's Hand and Measuring Tools	30.0	2.0
DEMEX 1108 Describe and Use Mechanic's Power Tools	30.0	2.0
DEMEX 1109 Describe and Service Hydraulic Systems	18.0	1.0
DEMEX 1110 Oxyacetylene Welding	18.0	1.0
DEMEX 1111 Arc Welding	12.0	1.0
DEMEX 1112 Lifting and Blocking	24.0	2.5
DEMEX 1113 Overhaul Internal Combustion Engines	60	4.0
DEMEX 1114 Engine Support Systems	120	10.0
DEMEX 1115 Service Cylinder Block Assemblies	120	10.0
DEMEX 1116 Service Engine Support Systems	135	9.0
DEMEX 1117 Electrical Systems/Components	120	15.0
DEMEX 1118 Emission Control Problems	60	4.0
DEMEX 1119 Describe Diesel Fuel Systems	30	2.0
DEMEX 1120 Service Diesel Fuel Systems	120	10.0
DEMEX 1121 Troubleshoot Diesel Engines	90	8.0
DEMEX 1122 Marine Gear	15	1.0
DEMEX 1123 Prepare for Employment	12	1.0
MEDI 1000 MED A-1 Basic Safety*	18	1.0
MEDI 1020 MED B-1 Survival Craft*	30	2.0
MEDI 2000 MED B-2 Marine Fire Fighting*	30	2.0
MENG 1990 Co-op 1 (approx 26 wks) <sup>1</sup>	910	30.5
<b>Total</b>	<b>2020</b>	<b>125.0</b>

\* These courses will be offered at the Pacific Marine Training Campus (North Vancouver) and the Justice Institute (New Westminster)

<sup>1</sup>This is an estimate only. Students are required to complete the hours assigned to them by the shipping company.

**Second Year (46 weeks):**

Training at the Pacific Marine Campus	600	40.0
MENG 1990 Co-op I (approx 26 wks) <sup>1</sup>	910	30.5
<b>Total</b>	<b>1510</b>	<b>70.5</b>

<sup>1</sup>This is an estimate only. Students are required to complete the hours assigned to them by the shipping company.

**Third Year (46 weeks):**

Training at the Pacific Marine Campus	600	40.0
MENG 1990 Co-op I (approx 26 wks) <sup>1</sup>	910	30.5
<b>Total</b>	<b>1510</b>	<b>70.5</b>

<sup>1</sup>This is an estimate only. Students are required to complete the hours assigned to them by the shipping company.

**Fourth Year (20 weeks):**

Training at the Pacific Marine Campus	600	40.0
<b>Total</b>	<b>600</b>	<b>40.0</b>

The 2<sup>nd</sup>, 3<sup>rd</sup>, and 4<sup>th</sup> year program will focus on training in the following areas:

- Materials
- Mathematics
- Applied Mechanics
- Refrigeration & Air Conditioning
- Naval Architecture
- Chemistry
- Electrotechnology
- Automation, Control and Instrumentation
- First Aid
- Marine Law
- Thermodynamics
- Blue Print Reading and Free Hand Sketching
- Computer Aided Drafting
- M.E.D.
- Marine Power Systems
- Communication and Computer Skills
- Business
- First Aid
- ISM Code
- Workshop Practice

**Faculty and Staff**

Robert Kitching, Associate Dean,  
Pacific Marine Training Campus

**Marine Engineer Fourth Class**

(Program under development for correspondence format)  
Prepares participants for all Transport Canada examinations leading to the Fourth Class Marine Engineer Certificate of Competency, which qualifies the holder to act as a watch-keeping 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.

**Entrance Requirements**

None.

**Admission/Registration Procedures**

Please contact the Registration Office at PMTC: telephone (604) 985-0622 or fax (604) 985-2862.

**Sea Service Requirement**

36 months "qualifying time," which must include six months seateime.

**Note:** Applicants for the Transport Canada final oral examination leading to the Fourth Class Marine Engineer Certificate of Competency must also complete:

- Propulsion Plant Simulator level I
- Marine Emergency Duties(MED) A-I, B-I, B-2, C
- Standard First Aid

These are not included in the Fourth Class program and must be enrolled separately.

**Program Content**

**MENG 4000 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.

**Engineering Knowledge: 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.

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## Marine Engineer Fourth Class cont.

### Engineering Knowledge: 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

Prepares students for all Transport Canada 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 and 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 Transport Canada 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 Transport Canada examinations.

### Program Length

32 weeks.

### Entrance Requirements

Fourth Class Marine Engineer Certificate of Competency (required for both accredited and Transport Canada examination study programs).

### Admission/Registration

Please contact the Registration Office at PMTC: telephone (604) 985-0622 or fax (604) 985-2862.

### Sea Service Requirement

12 months sea service is required before writing the Engineering Knowledge examinations at the Transport Canada Examination Centre.

**Note:** Applicants for the Transport Canada final oral examination for the *Third Class Marine Engineer Certificate of Competency* must have completed:

- Propulsion Plant Simulator level I (level II is also required for a "STCW 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

#### MENG 3103 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. MENG 3100 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.

#### MENG 3101 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 per cent of the course is spent in the laboratory.

#### MENG 3001 Engineering Knowledge: General Marine

**Engineering Principles and Practice** Expands 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.

#### MENG 3002 Engineering Knowledge: Marine Internal Combustion Machinery

Develops 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.

**Engineering Knowledge: Marine Steam Machinery**

Due to low demand, PMTC does not currently offer this course. However, steam auxiliary machinery is addressed in the Engineering Knowledge: General course (MENG 3001).

**Marine Engineer Second Class**

This program prepares participants for all Transport Canada 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, Electro-technology 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**

39 weeks.

**Entrance Requirements**

Third Class Marine Engineer Certificate of Competency.

**Admissions/Registration**

Please contact the Registration Office at PMTC: telephone (604) 985-0622 or fax (604) 985-2862.

**Sea Service Requirement**

12 months.

**Note:** Applicants for the Transport Canada final oral examination for the Second Class Marine Engineer Certificate of Competency must have completed:

- Propulsion Plant 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**

**MENG 2102 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.)

**MENG 2103 Applied Mechanics** — Studies 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.

**MENG 2100 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.

**MENG 2101 Electrotechnology** — Studies 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.

**MENG 2104 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.

**MENG 2001 Engineering Knowledge: 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 prevention of gas accumulation in enclosed spaces; fire detection systems and the use of portable and fixed extinguishing equipment.

*continued next page*

## Marine Engineer Fourth Class cont.

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.

**MENG 2002 Engineering Knowledge: 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; construction 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.

**Engineering Knowledge: 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

Prepares participants for all Transport Canada 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

31 weeks.

### Entrance Requirements

Second Class Marine Engineer Certificate of Competency.

### Admission/Registration

Please contact the Registration Office at PMTC: telephone (604) 985-0622 or fax (604) 985-2862 for admission restrictions and general requirements).

## Sea Service Requirement

18 months.

## Additional Requirements

Applicants for the Transport Canada final oral examination for the First Class Marine Engineer Certificate of Competency must have completed:

- Propulsion Plant 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

**MENG 1103 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.

**MENG 1100 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.

**MENG 2101 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.



**MENG 1104 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.

**MENG 1001 Engineering Knowledge: General Marine Engineering Principles and Practice** — Emphasises 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.

**MENG 1002 Engineering Knowledge: Marine Internal Combustion Machinery** — Emphasises 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.

#### Instructors

M. Davison, mdavison@bcit.bc.ca  
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*Don't let your car  
leak oil, gas or  
anti-freeze - they  
damage the aquatic  
environment.*



## Marine Engineer

### Professional Development and other courses

Please contact PMTC at (604) 985-0622 for more information on these courses and when they will be offered.

**MEPD 0001 Math Correspondence** — 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. 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.

### Course Length

24 weeks (suggested).

### Entrance Requirements

None.

### Course Description

Topics include algebra, logarithms, trigonometry and geometry.

**MEPD 1520 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 six students.

### Course Length

Five days (30 hours).

### Entrance Requirements

None.

**MEPD 1540 Marine Engineer Electrical Generator Systems** — Provides, for the Marine Engineer, a comprehensive understanding of the dynamic behavior 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 six students.

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## Marine Engineer cont.

### Course Length

Two days (12 hours).

### Entrance Requirements

None.

#### **MEPD 1560 Marine Engineer Pneumatic Controls**

**Familiarization** — Introduces the operating Marine Engineer 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

Five days (30 hours).

### Entrance Requirements

A Fourth Class Marine Engineer Certificate of Competency (or higher) is preferred.

**MEPD 1580 Marine Engineer Hydraulics** — Provides 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

Five days (30 hours).

### Entrance Requirements

A Fourth Class Marine Engineer Certificate of Competency (or higher) is preferred.

#### **MEPD 1550 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 and arc 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).

### Entrance Requirements

None.

#### **MEPD 1510 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 analyse that data. Enrolment will be limited to four students.

### Course Length

30 hours.

### Entrance Requirements

Basic knowledge of DOS is essential, and a Fourth Class Marine Engineer Certificate of Competency (or higher) is preferred.

## Nautical Sciences

The Pacific Marine Training Campus offers a variety of preparatory courses leading to Transport Canada 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 Transport Canada. Descriptions of the courses within each program follow on page 261. 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 Transport Canada examinations for that subject. If accreditation is granted by Transport Canada, 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 Transport Canada regulations governing prerequisites and sea service requirements.

It is the responsibility of the student to obtain specific information regarding these regulations from the nearest Transport Canada Nautical Examination Centre. All decisions regarding eligibility and assessment of sea service are determined by the Transport Canada Examiner.

#### **Watchkeeping Mate Restricted (WKMR)**

Prepares participants for all Transport Canada examinations leading to the Watchkeeping Mate Restricted Certificate of Competency which qualifies the holder to carry out duties as a 2nd mate of any vessel within Local Trade voyage limits, or 1st mate of a vessel not exceeding 350 tons, or a tug of any size, within Local Trade voyage limits.

The WKM (unrestricted) Certificate of Competency requires the additional 051 Astro-Navigation examination, and will qualify the holder to carry out duties as 3rd mate of any vessel, 2nd mate of any vessel working within Intermediate Trade limits, or 1st mate of any vessel not exceeding 350 tons, or a tug of any size working within Intermediate Trade limits.

### Program Length

21 weeks.

### Entrance Requirements

None.

### Sea Service Requirement

24 months.

### Program Content

NAUT 0012 Communication  
 NAUT 0041 041 Chartwork  
 NAUT 0061 061 Navigation Safety  
 ENAV 1000 Simulated Electronic Navigation I (SEN I) part A  
 ENAV 1050 Simulated Electronic Navigation I (SEN I) part B  
 NAUT 0151 151 General Ship Knowledge  
 NAUT 0161 161 General Seamanship

**Note:** When applying for the final oral Transport Canada examination for the WKM certificate, an applicant must submit:

- valid SIM I
- 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 Operator's Certificate

First Aid, MED, and 051 Astro Navigation courses are not included in the Watchkeeping Mate program but they are offered by PMTC. Students are advised to complete the First Aid and MED requirements before the start of the WKM program. A course for students preparing for the Restricted Operator's Certificate 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 must take the 051 Astro-Navigation module also, which is not a part of the WKM program.

### Master, 350 GT

Prepares the holder of the WKMR Certificate for Command Endorsement examinations, which qualifies the holder to act as a Master of a vessel not exceeding 350 tons gross tonnage (within the Local Trade limits), or of a tug of any size.

### Program Length

Seven weeks.

### Entrance Requirements

Watchkeeping Mate Restricted Certificate of Competency.

### Sea Service Requirement

36 months. Twelve months must be served as an officer in charge of a watch on vessels of at least five (5) gross tons making local or minor water voyages, while in possession of a certificate as Watchkeeping Mate Restricted.

### Program Content

NAUT 0073 072 Meteorology  
 NAUT 0092 090 Industrial Safety and Ship Management  
 NAUT 0160 160 General Seamanship

**Note:** Applicants for the final Transport Canada 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.

### First Mate, Intermediate Trade

Prepares the participant for the Transport Canada examinations leading to the issuance of the First Mate Intermediate Trade 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 Intermediate Trade vessel.

### Program Length

25 weeks.

### Entrance Requirements

Watchkeeping Mate Restricted Certificate of Competency.

### Sea Service Requirement

12 months in charge of a watch while in possession of a Watchkeeping Mate Certificate.

### Program Content

NAUT 0051 051 Astro-Navigation  
 NAUT 0091 091 Industrial Safety and Ship Management  
 NAUT 0113 112/113 Stability  
 NAUT 0122 122 Ship Construction and Cargo

In addition, students are required to pass examinations in:

- 132 Mechanical Engineering
- 162 General Seamanship

Some assistance is available for preparation for these examinations. Please contact course instructor for more information.

*continued next page*

## Nautical Sciences cont.

**Note:** Applicants for the final Transport Canada examination for the First Mate Intermediate Trade Certificate of Competency must also show proof of:

- valid Simulated Electronic Navigation (SEN) I, and SIM 1
- MED part C
- MED part D
- valid Standard First Aid

These are not included with the ON II program, and must be enrolled separately.

### Master, Intermediate Trade

Prepares the participant for Transport Canada examinations leading to the issuance of the Master Intermediate Trade 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 Intermediate Trade vessel.

### Program Length

21 weeks.

### Entrance Requirements

First Mate Intermediate Trade Certificate of Competency.

### Sea Service Requirement

12 months while holding a First Mate Intermediate Trade Certificate of Competency.

### Program Content

NAUT	0052	052 Astro-Navigation and Electronic Navigation
NAUT	0062	062 Navigation Safety
NAUT	0073	073 Meteorology
NAUT	0092	092 Industrial Safety and Ship Management
NAUT	0123	123 Cargo
NAUT	0133	133 Construction and Engineering Knowledge
NAUT	0163	163 General Seamanship

**Note:** Applicants for the final examinations leading to the Master Intermediate Trade 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 Master Intermediate Trade course and must be enrolled separately. Courses are only offered subject to sufficient enrolment. Please contact the PMTC Registration Office for details at (604) 985-2862.

## Master Mariner

PMTC does not currently offer a program for students preparing for the Transport Canada examinations leading to the Master Mariner Certificate of Competency. However, the following subject areas are available in cooperation with the Marine Engineering section:

MENG	2104	114 Naval Architecture
MENG	3001	134 Engineering Knowledge

### Entrance Requirements

Master Intermediate Trade Certificate of Competency.

### Sea Service Requirement

12 months in charge of the watch while holding an Master Intermediate Trade Certificate of Competency.

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 Limited, over 60 GRT, Minor Waters

Prepares the participant for Transport Canada 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

15 weeks.

### Entrance Requirements

None.

### Sea Service Requirement

Six months watchkeeping service on related waters while holding WKMR, First Mate Ltd.

### Program Content

NAUT	0041	040 Chartwork
NAUT	0061	062 Navigation Safety
NAUT	0011	011 Communication
ENAV	1000	SEN I Part A
ENAV	1050	SEN I Part B
NAUT	0161	161 General Seamanship

**Note:** Candidates for the examinations must present the following certificates:

- Restricted Radio Operator's Certificate;
- Marine Emergency Duties: MED A-I, B-I, B-2, C, and D.
- Standard First Aid

These are not included with the Master Minor Waters program, and must be enrolled separately.

### Instructors

P. Durell, Chief Instructor, pdurell@bcit.bc.ca  
 R. Goeller, rgoeller@bcit.bc.ca  
 R. Hesp, rhesp@bcit.bc.ca  
 P. Ireland, pireland@bcit.bc.ca  
 T. Noack, tnoack@bcit.bc.ca  
 M. Rudrakumar, mrudraku@bcit.bc.ca

## Transport Canada Module Descriptions for Nautical and Fishing Certification

The following list is not a syllabus, but does provide a general description of some of the topics covered within each of the Transport Canada modules (examinations).

**011 Communications** — Introduces 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** — Covers 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** — Presents the use of radar, Decca and Loran; use of operator's manuals; recognition of errors; limitations of the equipment.

**040 Chartwork and Pilotage** — Explores 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** — Teaches students to determine 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** — Introduces 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** — Covers 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** — Teaches 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** — Presents a detailed study of multi-ship traffic situations and the applicability of the traffic regulations in collision avoidance.

**072 Meteorology** — Explores 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** — Presents 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** — Explores the 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** — Covers 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** — Explores the Canada Shipping Act; Pilotage Act; safety regulations; response to emergencies; oil pollution prevention; Regulations covering ship operation, insurance, bills of lading, customs procedures, Canadian Labor 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.

*continued next page*

## Transport Canada Module Descriptions for Nautical and Fishing Certification cont.

**I 12 Stability** — Teaches 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.

**I 13 Stability** — Covers all material in Stability I 12, but also includes the mathematical treatment of intentional and unintentional flooding of compartments, and the application of Simpson's Rules.

**I 22 Ship Construction and Cargo** — Presents 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.

**I 23 Cargo** — Explores 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.

**I 32 Mechanical Engineering** — Covers 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.

**I 33 Construction and Engineering Knowledge** — Introduces 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.

**I 51 General Ship Knowledge** — Presents 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.

**I 57 General Ship Knowledge** — Covers 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.

**I 60 General Seamanship** — Introduces 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.

**I 61 General Seamanship** — Explores 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.

**I 62 General Seamanship** — Introduces 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.

**I 63 General Seamanship** — Explores 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.

**I 66 General Seamanship** — Presents 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.

**I 67 General Seamanship** — Covers all material in General Seamanship I 66 plus preparation of a fishing vessel for survey and inspection; weather reports and weather systems; Collision Regulations.

## Propulsion Plant Simulator Training

Effective September 1, 1994, all candidates for Marine Engineer Certificates of Competency must complete Simulator Training and successfully pass the Transport Canada assessment exercise.

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.

**MERS 1000 Propulsion Plant Simulator Level I Watchkeeper and Control Room Operator** — Presents this required course 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 in propulsion plant operation and watch-standing. Emphasis will be on watchstanding procedures associated with main engine, and subsystems, for both slow and medium speed engines.

### Course Length

80 hours.

### Entrance Requirements

Six months seetime.

**MERS 2000 Propulsion Plant Simulator Level II Plant Managers** — Presents this required course 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 Transport Canada 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.

### Entrance Requirements

Marine Engine Room Simulator Level I, or 24-hour "Familiarization" course.

### MERS 0100 Propulsion Plant Simulator "Familiarization"

Introduces 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.

### Entrance Requirements

Six months seetime.

**MERS 3000 Propulsion Plant Simulator "Continued Proficiency Certificate"** — Includes, 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.

### Entrance Requirements

Six months seetime.

### Seamanship Programs

Marine Emergency Duties

All Marine Emergency Duties (MED) training provided at PMTC is approved by Transport Canada. 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 Transport Canada, Ship Safety Branch. In the Vancouver area the telephone number is (604) 666-0834.

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.

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## Propulsion Plant Simulator Training cont.

### 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 seven 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."*

### MEDI 1000 Marine Emergency Duties

**A-1: Basic Safety 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. 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.

### Course Length

Three days, 0830 to 1600 daily.

### Course Location

Day 1 - PMTC, North Vancouver  
Day 2 - JIBC-FSTC, Maple Ridge  
Day 3 - PMTC, North Vancouver

### Entrance Requirements

None.

### Course Content

**Hazards and Emergencies** — Introduces safe practices and procedures; fire and explosions; structural failure; foundering and grounding; cargo emergencies; man overboard situations; medical emergencies.

**Fire Fighting** — Presents heat and radiation feedback; fuels and oxygen; fire classes; fire spread and its control; fire extinguishers; personal protection and backup.

**Emergency Response** — Covers emergency organization; emergency signals and muster; duties in an emergency.

**Lifesaving Appliances** — Covers 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** — Explores human behavior 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** — Introduces Emergency Position Indicating Radio Beacon (EPIRB); daylight signalling devices and flares; rescue sling, basket, net, litter.

### MEDI 2000 Marine Emergency Duties

**A-2: Small Vessel Safety Course** — Teaches small craft operators and their crew 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. 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.

### Course Length

Four days, 0830 to 1600 daily.

### Course Location

Day 1 - PMTC, North Vancouver  
Day 2 - JIBC-FSTC, Maple Ridge  
Day 3 and 4 - PMTC, North Vancouver

### Entrance Requirements

None.

### Course Content

**Hazards and Emergencies** — Introduces safe practices and procedures; fire and explosion; structural failure; foundering and grounding; cargo emergencies; man overboard situations; medical emergencies.

**Emergency Response** — Explores emergency organization and response planning; emergency signals and muster; duties in emergency parties; drill and training sessions; preparing a safety manual.

**Fire Fighting** — Covers 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** — Presents 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** — Introduces human behavior 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.

### **MEDI 1020 Marine Emergency Duties**

**B-1: Survival Craft Course** — Teaches orderly abandonment of a vessel in an emergency situation; clearing the vessel; proper and effective use of equipment; coordinating survival activities during rescue operation. 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.

### **Course Length**

Five days, 0830 to 1600 daily.

### **Course Location**

PMTC, North Vancouver

### **Entrance Requirements**

MEDI 1000 Marine Emergency Duties A-1 or  
MEDI 2000 Marine Emergency Duties A-2

It is recommended that trainees acquire a minimum of three months sea time before enrolling in this course.

### **Course Content**

**Lifeboats** — Explores 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** — Introduces 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** — Presents 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** — Reviews construction and characteristics; components, equipment and markings; stowage on ships, float-free system; davit launch and high speed evacuation; inspection and maintenance.

**Practical Raftmanship** — Covers preparation for, and launching of, a liferaft; loading and/or boarding; boarding from water; manoeuvring, propulsion, repairs.

**Abandonment** — Teaches recovery of persons from the water; post-abandonment action; marshalling lifeboats and liferafts; towing precautions.

**Survival and Rescue** — Explores human behavior under survival conditions; physiological and physical stress; preparation and positioning for rescue; helicopter and surface craft rescue; communication and signalling equipment.

### **MEDI 2020 Marine Emergency Duties B-2: Marine Fire**

**Fighting Course** — Presents 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. This course is designed for candidates of 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.

### **Course Length**

Five days, 0830 to 1600 daily.

### **Course Location**

JIBC-FSTC, Maple Ridge.

### **Entrance Requirements**

MEDI 1000 Marine Emergency Duties A-1 or  
MEDI 2000 Marine Emergency Duties A-2

It is recommended that trainees acquire a minimum of three months sea time before enrolling in this course.

### **Course Content**

**Marine Fire Theory** — Teaches the theory of fire; classes of fire; stages of fire; techniques of fire fighting; duties of team members.

**Marine Fire Safety and Prevention** — Explores systematic attack methods; fire prevention techniques; crew training and fire drills.

**Protective Gear and Rescue Techniques** — Introduces protective clothing and equipment; techniques of ventilation; planning a search and rescue operation; methods of handling casualties.

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## Propulsion Plant Simulator Training cont.

**Fire Extinguishing Equipment and Agents** — Covers 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** — Covers 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** — Introduces 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.

**MEDI 1040 Marine Emergency Duties C: Officer Certification Course** — Teaches students 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. This course is designed for Deck and Engineer Junior Officers of commercial vessels.

### Course Length

Three days, 0830 to 1600 daily.

### Course Location

Day 1 and 2 - PMTC, North Vancouver  
Day 3 - JIBC-FSTC, Maple Ridge

### Entrance Requirements

MEDI 1020 Marine Emergency Duties B-1 and  
MEDI 2020 Marine Emergency Duties B-2.

### Course Content

**Fixed Fire Fighting and Detection Systems** Teaches capabilities and limitations of systems; safe practices and procedures; combination and interrelation of detection and extinguishing systems.

**Inspection and Maintenance** — Explores 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** — Covers initial response of a watch; turning over responsibility; leadership styles; duties of an emergency team.

**Fire Fighting On-Scene Leader** — Introduces 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** — Presents recording of salient events during an emergency.

**Crowd Management** — Teaches controlling and directing a crowd; passengers as assistants to crew; communication.

**External Search and Rescue** — Introduces distress call procedures; initial response to a distress signal; planning and execution of a search; preparation for recovery.

**Conduct of Training Sessions** — Covers planning and preparing training; instructional techniques; onboard familiarization course.

**MEDI 1060 Marine Emergency Duties D: Senior Officer Course** — Teaches students 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. This course is designed for candidates for senior certificates of competency required for both deck and engine room positions.

### Course Length

Two days, 0830 to 1600 daily.

### Course Location

PMTC, North Vancouver.

### Entrance Requirements

MEDI 1040 Marine Emergency Duties C.

### Course Content

**Contingency Plans** — Covers 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** — Presents regulations and requirements for drills; preparation of the crew for emergencies; planning, management and conduct of training sessions and drills.

**Emergency Management** — Explores managing an emergency response; assimilation of data; procedures, language and methods of internal communications; leadership styles; case studies.

**Damage Control** — Introduces 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** — Presents reasons and conditions for abandonment; partial and total abandonment; signals and documentation.

**Search and Rescue (SAR)** — Covers 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.

**MSSM 1050 Standard First Aid** — In cooperation with St. John Ambulance, PMTC offers Safety Oriented First Aid at the Standard Level.

### Course Length

2 days, 0830 - 1630.

### Entrance Requirements

None.

### Course Content

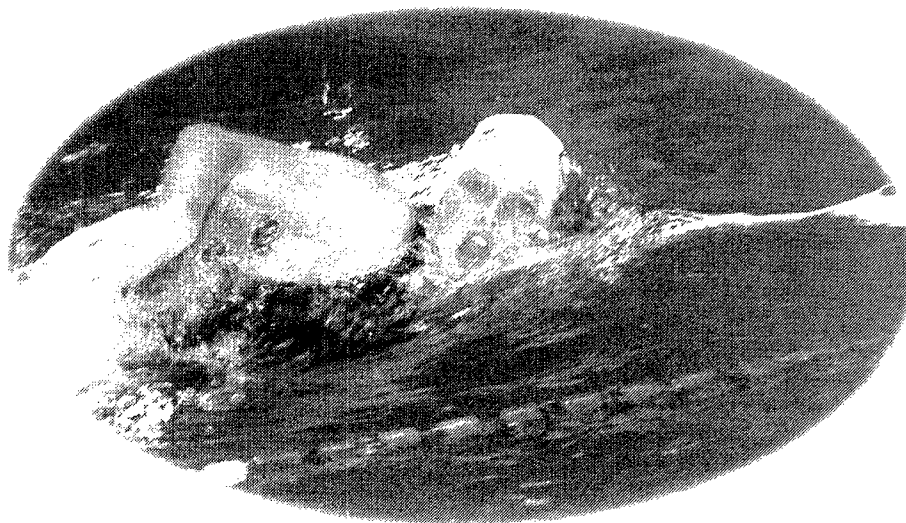
Includes, in this comprehensive modular course, workbook readings; audiovisual presentations; practical exercises; and examinations. Please note that the workbook assignment must be completed prior to attendance in class, so students are required to register at least one week in advance.

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

### Instructors

R. Goeller, [rgoeller@bcit.bc.ca](mailto:rgoeller@bcit.bc.ca)  
 J. Perdriel, (MED A-1, A-2, and B-1)  
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## 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.

### **MSSM 2000 Supervisor of Oil Transfer Operations -**

**Part C** — Presents safe supervision for the transfer of crude and refined oils from (a) between barge and facility, and (b) barge to barge/ other vessel.

To be eligible for the Transport Canada SOTO certificate, (EXN-24), the candidate must complete parts A, B, and C. It shall be understood that Part C of the SOTO certification is specifically designed for existing certificated personnel presently serving in the industry, and new personnel who have successfully completed Parts A and B.

### **Course Length**

Five days - 30 hours, 0830 - 1600 daily.

### **Course Location**

All days at PMTC with the exception of one field trip day (to be arranged during the week).

### **Entrance Requirements**

It is the responsibility of the student to ensure they meet with the Transport Canada requirements:

- SOTO Part A - Basic Training or
- equivalent training/ certification (Bargemaster) as approved by Transport Canada and
- SOTO Part B - three months operational and supervised experience approved by Transport Canada. and
- Marine Emergency Duties (MED) A-I
- Marine Emergency Duties (MED) B-2 and
- completion of Industry Canada ROC examination and proof of medical fitness

### **Course Content**

Pipeline layouts and theory  
Pumps and pump theory  
General vessel maintenance  
Cargo planning and calculations  
General paperwork and operations  
Transfers when not alongside  
Pollution Prevention Regulations and Environment Response  
Communications

### **MSSM 2050 Advanced Petroleum Tanker Safety Course**

— Presents 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 Transport Canada Petroleum Tanker Endorsement. This course is approved by Transport Canada, 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.

### **Course Length**

Eight days, 0830 - 1600 daily.

### **Course Location**

All days will be conducted at PMTC, North Vancouver, with the exception of day four, which will be conducted at the JIBC - Fire and Safety Training Centre in Maple Ridge.

### **Entrance Requirements**

Course and Endorsement Requirements: Transport Canada Certificate of Competency valid Marine Emergency Duties (MED) B-2. It is the responsibility of the student to ensure that they comply with Transport Canada requirements.

### **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

# Course Descriptions

## AUTOCAD

### 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.

## BROADCAST COMMUNICATIONS

### BCST 1100 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 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 Copywriting I —** 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 Radio Programming and Operations I —

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 Radio Announcing I —

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 Contemporary Issues I —

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 Introduction to Radio News I —

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 Video Basics —** Teaches the basic components of a television production and how they interrelate. Equipment training 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 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 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. Some focus will be on reporting on municipal government activities.

### BCST 1131 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 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 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 1137 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 1223 Television Production Planning —

Teaches the student to plan all the elements necessary to guarantee a production that meets the professional standards of the television and video production industry, as well as organize and conduct pre and post-production meetings as the producer/director of a program.

### BCST 1235 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 Media Law —

Trains a broadcast journalist 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 Labour and Business** — Provides students with a good understanding of labor unions and the management structure. This course explains the structure of unions as well as the labor laws of B.C. and Canada. The second part of the course explores the complexities of business, finance and the stock market.

**BCST 2203 Copywriting 2** — Continues from BCST 1103. Prerequisite: BCST 1103.

**BCST 2209 Practicum I** — Presents a four-week practical exercise to complete first year. Radio students operate campus radio station CFML, 24 hours per day, during this period. Television students produce a news magazine program 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 Radio Programming and Operations 2** — Continues from BCST 1110. Major emphasis is on honing the technical operations skills learned in first term. Analog and digital commercial production, radio station operations, audition tapes, and the use of lightweight, portable equipment are topics for instruction in this term. Emphasis is placed on practical applications of theory. Prerequisite: BCST 1110.

**BCST 2211 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 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 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 and so on. Prerequisite: BCST 1113.

**BCST 2214 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 Video Production** — See BCST 1120. Prerequisite: BCST 1120.

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

**BCST 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 News Reporting** — Involves the student in identifying, researching and gathering of news material in an organized manner. The student is introduced to beat and filing systems, the courts, the police, organized labor, business and politics. Prerequisite: BCST 1130.

**BCST 2231 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. 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 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 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 Copywriting 3** — Presents a lab course in which the instructor works with 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 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 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 Feature Program Production I** — 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 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 Video Production** — Prepares 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 variety of program formats. Students will assume all managerial, production and support function responsibilities. Prerequisite: BCST 2220.

**BCST 3322 Television News** — Teaches more sophisticated visual techniques that are put to use in the daily preparation of electronic news gathering stories. Lectures, critiques and feedback are interspersed with weekly newscasts throughout the term. Prerequisite: BCST 2209.

**BCST 3325 News Shooting and Editing I** — 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 video 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 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 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 4403 Copywriting 4** — Continues from the work started in BCST 3303. Prerequisite: BCST 3303.

**BCST 4409 Practicum 2** — Allows students to locate industry positions to observe, practise, 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 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 Feature Program Production 2** — See BCST 3315. Prerequisite: BCST 3315.

**BCST 4420 Video Production 2** — See BCST 3320. Prerequisite: BCIT 3320.

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

**BCST 4430 Reporting Toolbox** — 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 Radio News 4** — Presents an advanced course in newsroom operations. Students continue to practise 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 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.

## BASIC HEALTH SCIENCES

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**BHSC 1101 Anatomy and Physiology I and 2** — Follows, together with BHSC 2201, a systems approach to study the relationship between structure and function in the human body. BHSC 1101 begins with a discussion of cells and tissues as basic structural/functional units. Regulation and integration of body functions and the role of control systems in homeostasis are introduced. Major systems covered include the nervous, endocrine and skeletal muscle systems. Examples of the uses of biomedical instruments in diagnosis and treatment are given where appropriate.

**BHSC 1102 Anatomy and Physiology I: 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 1103 Physiology and Pathophysiology I (NURS)** — Begins a two-course sequence that considers normal physiology and pathophysiology as they apply to contemporary nursing practice. Following sections on introductory basics, cell and tissue injury, inflammation and healing, the concept of Homeostasis is considered as a unifying theme in physiologic regulation. These concepts are applied to normal and disordered function of the endocrine and nervous systems, followed by a treatment of neoplasia and blood disorders.

**BHSC 1106 Anatomy and Physiology I** — Examines normal human structure and function based on a systems approach. This course is the first of two consecutive courses and includes basic human cytology and histology which serve as the foundation for the study of body systems. The first of these systems, the circulatory, is covered as well in this course. Remaining systems are covered in BHSC 2206.

**BHSC 1110 Anatomy and Physiology I (PROR)** — Examines normal structure and function based on a systems approach. This course is the first of two consecutive courses and is followed by BHSC 2210. Although all body systems will be introduced, the major emphasis will be on the skeletal, skeletal muscles and nervous systems, and their integrated role in human movement and stability. The focus will be on the microstructure and physiology of these systems. BHSC 1110 begins with a study of human cytology, histology, and embryological principles which serve as the foundation for the study of the body systems. It continues with a detailed coverage of the skeletal system and concludes with an introduction to the organization and microstructural details of the skeletal muscle system.

**BHSC 1112 Anatomy and Physiology I (ENPY)** — Introduces human anatomy and physiology using the systems approach. It provides electroneurophysiology students with terminology and physiological concepts likely to be encountered during the first term of the program.

**BHSC 1113 Anatomy and Physiology I (MRAD)** — Introduces to human anatomy and physiology using a systems approach. Emphasis is placed on those systems most commonly examined by the radiographic technologist. Systems covered in this course are skeletal, integumentary, urinary, digestive and respiratory.

**BHSC 1123 Microbiology I (ENVH)** — Deals with the basic concepts of microbiology with specific emphasis on areas that are of significance to students in the program, in particular, in public health inspection and protection. Also prepares the student for the more applied aspects of microbiology in BHSC 2223 which follows in Term 2, and other courses that include microbiology principles.

**BHSC 1126 Medical Microbiology and Immunology (NMED)** — Deals with the 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 1141 Human Behavior I (MRAD)** — Begins with organizational behavior from the perspective of the technologist and his/her immediate supervisor. The second half provides the student with social and psychological concepts related to processes.

**BHSC 1145 Human Behavior (CARD)** — Explores basic considerations of behavioral science relevant to cardiology technologists' concerns. Theory and research findings dealing with stress and illness behavior will be presented. Professional and ethical considerations and ways of dealing with common hospital events will be explored. Emphasis will be on human relations skills in dealing with patients and staff.

**BHSC 1204 Anatomy and Physiology (ENVH)** — Introduces human anatomy and physiology presented in a conventional systems approach, integrating structure and function. The physiology is presented around the central theme of homeostasis, and students are given examples of how changes in the internal and external environments can disrupt homeostasis.

**BHSC 1207 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.

**BHSC 1242 Behavioral 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 behavior, pain management, interpersonal communication, adjustment in self-image, the disabled person in society and relationships among health care professionals.

**BHSC 1339 Human Behavior (ENPY)** — Explores basic considerations of behavioral science relevant to the electroneurophysiology technologist's concerns. Theory and research findings dealing with stress and illness behavior will be presented. Professional and ethical considerations and ways of dealing with common hospital events will be explored. Emphasis will be on human relations skills in dealing with patients and staff.

**BHSC 1439 Human Behavior (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 2201 Anatomy and Physiology 2 (BMET)** — Continues the systems approach to the study of human anatomy and physiology begun in BHSC 1102. Major systems discussed include the circulatory, respiratory, and urinary systems. The electrical properties of bone under stress is also introduced. The digestive system is discussed briefly. Examples of the uses of biomedical instruments in diagnosis and treatment are given.

**BHSC 2203 Physiology and Pathophysiology 2 (NURS)** — Continues from BHSC 1103. Focuses on physiological regulation and disease in the cardiovascular, respiratory, gastrointestinal, urinary, reproductive and skeletal muscular systems. A section on fluid and electrolyte disorders is included to complete the course content. Both courses combine to provide the foundation on which a broad array of clinical applications depend. Prerequisite: BHSC 1103.

**BHSC 2206 Anatomy and Physiology 2 (NMED)** — Examines normal structure and function based on a systems approach. This course is the second of two consecutive courses examining normal human structure and function. The respiratory, digestive, skeletal, endocrine, nervous and urinary systems will be covered.

**BHSC 2210 Anatomy and Physiology 2 (PROR)** — Continues from BHSC 1110. Begins with the physiology of skeletal muscle. It continues with a detailed discussion of the nervous system and its role in control of muscle. Basic principles of circulation and respiration are covered and a brief introduction to the roles of the digestive, urinary, endocrine, and reproductive systems conclude the course.

**BHSC 2211 Regional Anatomy I (PROR)** — Provides, together with BHSC 3311, a laboratory course following a regional approach to the study of human anatomy. Preserved Rhesus monkeys will be dissected. Of major concern will be the study of the muscles (including their innervation and vasculature) and skeletal structures of the lower limbs.



**(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 2213 Anatomy and Physiology 2 (MRAD)** — Continues from BHSC 1113.

This course uses a systems approach to examine the cardiovascular, lymphatic, nervous, endocrine and reproductive systems.

**BHSC 2223 Microbiology 2 (ENVH)**

— Covers the basic principles of applied microbiology significant to public health inspection, environmental protection and foodborne illness investigation. The course also includes basic principles of body defense, differentiates between food tolerance and food hypersensitivity, and introduces the students to in-vitro tests employing immunological and microbiological principles. Microbiology of water, sewage, food, milk and dairy products constitute the major portion of the course. Prerequisite: BHSC 1123.

**BHSC 2241 Human Behavior** — Course description not available at this time.

**BHSC 3306 Pathophysiology I (NMED)**

— Introduces the principles of pathophysiology. The organ systems commonly investigated by nuclear medicine procedures are emphasized. Also considered are the major diseases that are encountered in contemporary nuclear medicine practice. Prerequisite: BHSC 2206.

**BHSC 3310 Pathology and Pathophysiology (PROR)**

— Introduces the principles underlying the pathological processes commonly encountered by the prosthetist/orthotist. Core concepts of tissue injury, inflammation, healing and neoplasia are treated first. On this foundation are developed the major aspects of deranged blood circulation, cardiac and respiratory disease, and disorders of bones, joints and the skin. Prerequisite: BHSC 2210.

**BHSC 3311 Regional Anatomy 2 (PROR)**

— Provides, together with BHSC 2211, a laboratory course following a regional approach to the study of human anatomy. Preserved Rhesus monkeys will be dissected. Of major concern will be the study of the muscles (including their innervation and vasculature) and skeletal structures of the upper limbs and trunk.

**BHSC 3312 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.

**BHSC 3329 Immunology for Nursing**

— Focuses on the role of the immune system in health and disease. Basic concepts of immunology, including non-specific resistance, both humoral and cell-mediated immune response to microbial pathogens, and foreign grafts and tumors are presented with special emphasis on their clinical application in the following three major areas: immunoprophylaxis and immunotherapy; blood transfusion and tissue/organ transplantation; and hypersensitivity, immunodeficiencies and autoimmune diseases. A special detailed discussion of Acquired Immune Deficiency Syndrome (AIDS) is also included. Prerequisite: BHSC 2203, 2228.

**BHSC 4406 Pathophysiology 2 (NMED)**

— Continues from BHSC 3306 and the introduction of the principles of pathophysiology. The organ systems commonly investigated by nuclear medicine procedures are emphasized. Also considered are the major diseases that are encountered in contemporary nuclear medicine practice. Prerequisite: BHSC 3306.

**BHSC 4410 Applied Pathology (PROR)**

— Presents disorders of movement and sensation of relevance to prosthetists and orthotists. Essential brain, spinal cord, nerve and muscle anatomy, and physiology underlying the initiation, execution, and control of movement are presented. In this context, using videotape, videodisc and case study examples, selected pathologies are explored: primary myopathies, myoneural junction defects, peripheral neuropathies including entrapments, disorders of the spinal cord including acute trauma, disorders that affect the function of the basal ganglia, cerebellum, cortex and pathways and vascular supply. Prerequisite: BHSC 3310.

**BHSC 5507 Anatomy and Physiology.**

**Pathophysiology (DSON)** — Provides an overview of the organ systems of particular interest to sonographers. Special emphasis is placed on the genito-urinary, digestive (including liver, gallbladder and pancreas) and cardiovascular systems as well as cross-sectional anatomy of the abdominopelvic cavity. Fetal development is discussed. In addition, an outline of the etiology and pathogenesis of diseases commonly investigated by ultrasonography is examined.

**BHSC 7423 Communicable Disease**

**Control (ENVH)** — Allows students to assess existing control measures for communicable diseases and propose new measures to contain emerging communicable diseases. The course systematically deals with bacterial, rickettsial, viral, parasitic infections and intoxications. Emphasis when dealing with each individual disease is given to reservoirs, modes of transmission and preventable measures. During discussions of communicable diseases that the public health inspector or environmental health officer is more likely to be involved with, there is some emphasis on the signs and symptoms. This is especially true of foodborne microbial diseases. The course also provides opportunities for students to enhance their communication, teamwork, critical thinking, problem-solving and computer skills within the context of communicable disease control. Prerequisite: BHSC 2223.

**BHSC 7601 (BHSC 5601) Sectional Anatomy of the Abdomen and Pelvis**

— Designed for technologists who require knowledge of cross sectional anatomy of the abdomen and pelvis, including body planes. Various Imaging techniques will be discussed and will provide much of the visual support material. Anatomic, functional and pathological relationships among the organs will be emphasized. 3 credits

**BHSC 7602 (BHSC 5602) Cross Sectional Anatomy of the Thorax** — Designed for all medical Imaging technologists, the course is an exploration of the three-dimensional anatomy of the chest. Major anatomic features will be examined with emphasis on sectional appearance in all three fundamental body planes. The anatomic, functional and pathological relationships among organs of the chest will be included. Prerequisite: Medical Imaging Technologist with RTR Certification. 3 credits

**BHSC 7603 (BHSC 5602) Sectional Anatomy of the Head and Neck** —

Explores the anatomy of the extracranial head and neck and the adult brain and cervical spinal cord from relational and sectional perspectives. The major anatomic features will be examined with an emphasis on their appearance in all three fundamental body planes for the extracranial head and neck and the conventional transverse planes for the cervical cord and oblique, coronal and sagittal planes for the brain. While the sectional anatomy of the head and neck is the focus of this course, functional and pathologic relationships and processes will anchor, illustrate and provide relevance.

**BHSC 7604 (BHSC 5604) Cross Sectional Anatomy of the Musculoskeletal System**

— Designed for technologists who require a knowledge of cross-sectional anatomy of the musculoskeletal system. This course will be of particular interest for MR and CT Technologists. Prerequisites: Graduates of approved program in diagnostic medical radiography/nuclear medicine/therapy. 3 credits

## BIOTECHNOLOGY

**BIOT 1020 Introductory Microbiology** —

Trains students in the basic microbiological procedures employed in a laboratory, including the use and care of the microscope; staining methods, aseptic techniques; culturing; and methods of identifying and enumerating important microorganisms.

**BIOT 1030 Biology I for ENVT** —

Introduces the anatomical and physiological attributes of microorganisms, plants and animals. Topics covered include: biochemical pathways, cell structure and function, cell division, genetics, major organs and systems. The taxonomic framework of life is examined on an evolutionary basis from single-celled organisms to higher plants and animals. General microbiology techniques including: slide preparation, examination, culturing and enumeration will be covered. Specific emphasis will be given to the operation and maintenance of all instruments used in this course.

**BIOT 1310 Introductory Biotechnology**

— Surveys 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 I** — Studies 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 I** — 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 micro-organisms 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 micro-organisms are performed. Procedures that distinguish between the major microbial groups are performed.

**BIOT 2350 Biology 2** — Studies 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 332) Molecular**

**Genetics I** — Introduces genetic analysis viewed from the molecular level. Topics include: Mendel's Laws, chromosome mapping, gene mutation, DNA structure, DNA function and 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 I** —

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 micro-organisms 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, regulation of gene expression, mutation, recombination, transposable elements and extranuclear DNA. 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 analysed. Methods for isolation, purification and analysis of simple and complex biopolymers will be studied. Prerequisite: BIOT 3340.

**BIOT 4360 (BISC 436) Process Systems for Biotechnology —**

Studies 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 analysed. Prerequisite: BIOT 3330, PHYS 2141.

**BIOT 4370 Management and Regulatory Affairs for Biotechnologists —**

Teaches the biotechnology student skills that will assist in 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 8-12 of their final term of study. Students must also prepare a formal report on the outcome of their project.

**BLAW 1100 Introductory Law for OCHS**

— Introduces the student to the Canadian legal system including its development, constitutional law, the Charter, torts, contracts and business relationships.

**BUSINESS LAW**

**BLAW 3100 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 3300 Broadcast Law —** Introduces the Canadian legal system, emphasizing contracts, torts (including defamation and privacy), criminal law, court procedure, secured transactions, government agencies, employment law, forms of doing business and other topics applicable to broadcast business.

**BLAW 3410 Business and International**

**Law —** An overview of the central legal issues that arise when conducting business across international boundaries. International sale of goods contracts, letters of intent and international arbitration are some of the topics covered. A basic understanding of the Canadian legal system, contracts, torts and the sale of goods is provided.

**BLAW 3500 Law for Real Estate Market-**

**ing —** Covers the case law and legislation relevant to real property: a contract, tort liability, interests in B.C. land registration system, agency, mortgages, tenancies, condominiums, professional organizations and professional ethics. Prerequisite: BLAW 3100.

**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.

**BLAW 3800 Human Resource Manage-**

**ment Law —** Provides an overview of business law subjects normally studied by those seeking a career in business with emphasis on specific topics associated with the practice of human resources management. Subjects introduced include contracts, torts, the Canadian legal system, employment, human rights, Charter of Rights, and wrongful dismissal. Students will have some opportunity to study additional specific HRM topics such as freedom of information, harassment and privacy.

**BUILDING**

**BLDG 1000 Building Drafting —** Presents drawing as a tool for communication. Covers architectural drafting techniques and lettering; drawing development with emphasis on line technique and quality and graphic conventions; drawing systems: orthographic drawings and 3D drawings; presents drawing process in terms of project development and delivery.

**BLDG 1050 Construction Materials/**

**Processes 1 —** Covers job site materials, methods and planning. Students work through exercises based on materials and methods included in master format divisions 1, 2, 3. The role of the WCB, in job site safety, scheduling basics, is also included.

**BLDG 1200 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 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 Engineering Technology; hands-on practice and research assignments related to the topic.

**BLDG 2000 Planning** — Introduces methodology of the design process as an approach to creative problem-solving. Covers basic principles of site planning and residential design, with respect to spatial, functional, environmental and contextual issues. Topics include impact of site slope, climatic factors, zoning by-law regulations and context on building/site design; residential design with an emphasis on space planning and internal functional relationships. Prerequisite: BLDG 1000.

**BLDG 2050 Constr Materials/Processes 2**

— Provides the second part of a two-part course to introduce the student to basic materials and methods used in construction. It acquaints the student with physical and chemical properties, the manufacturing processes of various materials and how this affects their implementation in the construction project.

**BLDG 2200 Building Construction 2**

— Continues from BLDG 1200 and covers interior and exterior construction detailing. Introduction to post and beam construction, manufactured housing, and lightweight metal structures used in housing projects. Brief examination of reinforced concrete structures used in low-rise construction. Preparation of working drawings. Field trip to wood research laboratory (Forintek Canada). Prerequisite: BLDG 1200.

**BLDG 2250 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, COMM 1140.

**BLDG 2300 Construction Estimating 1**

— Covers general theories of measurement and pricing of construction work. Introduces recognition of work, specific methods of measurement, estimating forms and common techniques. Sources of cost data and bidding procedures are examined. Prerequisite: BLDG 1200.

**BLDG 2400 CADD for Building**

— Presents microcomputer-based CADD using AutoCAD software (latest version). 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 CADD Applications for Building**

— Continues from BLDG 2400. 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 Architectural Option 1**

— Provides 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 Economics/Construction Operations Option 1**

— Covers economic factors affecting 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 air, moisture, wind and so on, have 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 construction and post construction work such as building management, diagnosis and remediation. This course includes field trips. Prerequisite: Completion of first-year program.

**BLDG 3200 Building Construction 3**

— Examines typical building construction systems and assemblies including concrete, pre-cast concrete, roofing, windows, store front and interior finishes. Emphasis on the particular technical and procedural concerns in the development of working drawings in the context of construction contract documents. Guest lecturers and field trips supplement formal lecture and lab activities. Prerequisites: BLDG 2200, BLDG 2405.

**BLDG 3250 Construction Contracts 2**

— Examines current standard forms of Canadian construction contracts in detail; specifically stipulated sum CC DC-2 1994; 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 Construction Estimating 2**

— Provides more detailed study and application of measurement and pricing of the work of specific trades with emphasis on, concrete structure, excavation, and related items. Students build their own computer estimating program on a spreadsheet and examine a commercial program. Prerequisite: BLDG 2300.

**BLDG 3350 Construction Specifications**

— Presents the fundamentals of language as a means of communication; style in specifications; organizing and presenting information in construction contract documentation; filing and retrieval of construction information using Masterformat; procedures for preparing and reproducing project manuals; use of word processing equipment for specifications; practical applications. Prerequisite: BLDG 1050, 3200, 3250.

**BLDG 3500 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 British Columbia Building Code, with particular reference to Use and Occupancy, and the control of fire hazards. Prerequisite: BLDG 2000, 2200.

**BLDG 4000 Architectural Option 2**

— Continues from BLDG 3000. Covers graphics and freehand drawing of architectural subject matter; advanced design projects/problems; building systems interface; 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 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 labor 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 that govern building envelope components; in depth study of cladding systems, membranes, interface details and indoor air quality. Diagnostic skills are taught and applied to retrofit and building management work. Includes a number of field trips and an industry practicum. Prerequisite: BLDG 3100.

**BLDG 4200 Building Construction 4**

— Continues from BLDG 3200. Examines various larger building construction systems and assemblies including heavy timber, masonry, stucco, metal curtain wall, interior finishes and prefabrication. Emphasis on the particular technical and procedural concerns in the development of working drawings in the context of construction contract documents. Guest lecturers and field trips supplement formal lecture and lab activities. Prerequisite: BLDG 3200.

**BLDG 4303 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 4304 Construction Estimating 4**

— Presents estimating software that is used in industry. Prerequisite: BLDG 4303.

**BLDG 4400 Computer Applications in Construction Management**

— Presents practical computer applications with an emphasis on economic problems and scheduling associated with large comprehensive housing projects, high-rise construction and other large construction projects. Topics include construction estimating, construction cash flow and project management scheduling. Prerequisite: BLDG 1400, 3300.

**BLDG 4500 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 British Columbia Building Code, with particular reference to Use and Occupancy, and the control of fire hazards. Prerequisite: BLDG 2000, 2050, 2200.

**BLDG 4505 Building Acoustics**

— Covers theory and principles of sound including properties, propagation, sources and measurement techniques; noise criteria and control of interior/exterior noise in buildings. Selection of materials with appropriate acoustical and aesthetic qualities for building. Calculations encountered in acoustical considerations. Prerequisite: BLDG 3200.

**BIOMEDICAL ENGINEERING****BMET 1100 Electronics Principles and Practice I**

— 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 1482 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.

**BMET 2200 Electronics Principles and Practice 2**

— Analyses 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 and differential amplifiers. Prerequisite: BMET 1100.

**BMET 2215 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. Corequisite: BMET 2200. Prerequisites: BMET 1100, MATH 1151, MATH 1781.

**BMET 3300 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, regulators, etc. Lab exercises are coordinated with course content. Prerequisite: BMET 2200.

**BMET 3301 Biomedical Devices Technology I**

— Introduces students to basic properties of biomedical signals: collecting (transducers), processing, displaying and recording. The principles of operation, design, and construction of physiological diagnostic monitoring equipment will be presented through both block and schematic diagrams. Lab exercises are coordinated with course content. Prerequisite: BMET 2200, BHSC 2201.

**BMET 3302 Quality Assurance and Systems**

— Introduces the various factors involved in the implementation of a quality assurance in the practice of Biomedical Engineering: different approaches to problem-solving in Biomedical Engineering will be discussed. Laboratory sessions and assignments will be co-ordinated with theory. Prerequisite: Completion of level 2.

**BMET 3350 Construction Specifications**

— Presents the fundamentals of language as a means of communication; style in specifications; organizing and presenting information in construction contract documentation; filing and retrieval of construction information using Masterformat; procedures for preparing and reproducing project manuals; use of word processing equipment for specifications; practical applications. Prerequisite: BLDG 2050, 2200, 2250.

**BMET 4401 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 Biomedical Engineering Technology Project**

— Allows students to build a biomedical device using current 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 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 4415 Digital Systems and Microprocessors**

— Introduces 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, microprocessor development systems and C language interface, some development tools and relationships between these tools and cache memory.

**BMET 4420 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.

**BUSINESS ADMINISTRATION****BUSA 1100 Introduction to Management**

— Presents a study of the basic concepts of the management process: planning, organizing, staffing, directing and controlling. Integrated with the concurrent first term courses and using the case study method, it creates opportunities for the students to develop analytical, problem-solving, teamwork, and communications skills, by analysing and presenting solutions to typical business problems. Topics include structuring organizations, decision-making and an introduction to production, human resources, controlling, and strategic and tactical planning.

**BUSA 1102 Management for Food Technology**

— Introduces the basic concepts of the management process required to bring a food product from recipe to market. Topics include organizational structure, financing, marketing (including promotion and sales, manufacturing, staffing, and planning. It creates opportunities for the student to develop analytical, problem-solving, teamwork and communications skills necessary for an entrepreneur in food processing.

**BUSA 1200 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.

**BUSA 1201 Television Management**

— Designed to provide the student with an insight into setting up and running a company in the television production field. Topics include preparing a business plan, developing a marketing plan identifying target markets and monitoring cash flow.

**BUSA 1600 Decision Support 1**

— Begins the process of teaching the business student to appreciate the microcomputer as an aid to management. The course provides an introduction to basic business software that may include one or more of the following: MS Windows; MS Word; Excel; MS Access; the Internet; and the World Wide Web.

**BUSA 1610 Microcomputer Software I**

— 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 2200 Entrepreneurial Management**

— Investigates all factors involved in starting a business venture. Topics include analysing 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 1114, FMGT 1151.

**BUSA 2250 Business Fundamentals**

— 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 Behavior courses facilitate the development of a business plan at the conclusive stage of this course. Organizational Behavior courses will enhance the student's understanding of management concepts and applied skills in motivating, job design, group dynamics, leadership, conflict resolution, communication and multiculturalism.

**BUSA 2600 Decision Support 2**

— Builds on the BUSA 1600 course by expanding on the managerial approach developed in that course. This course will concentrate on more complex spreadsheet management tasks using a popular spreadsheet package. Prerequisite: BUSA 1600.

**BUSA 2610 Software Systems**

— See BUSA 1610. Prerequisite: BUSA 1610.

**BUSA 3500 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 3515 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 3600 Microcomputer Applications 2 (Databases) —**

Covers the process of building databases and applications with a commercial database package. Much of the course is generic in nature and many of the techniques, functions and procedures are applicable to database packages currently used in business. Prerequisite: BUSA 1600.

**BUSA 3700 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 4600 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.

**BUSA 4610 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 4620 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 Management Policy —**

Analyses business policy, formulation designed to give the student practise, 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: Students must have all of level one and two (or equivalents) completed plus all but one of level 3 courses (7 of 8 courses completed).

**BUSA 4810 Management Policy —**

Presents an analysis of business policy formulation designed to give the student practise, 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.

**BUSA 4900 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.

**BUSA 5200 Business, Society, and Ethics —**

Discusses a variety of topics. The emphasis may vary from semester to semester but may include: the relationship between government and the business system in Canada, the impact of foreign investment and free trade, consumerism, environmental protection, the impact of the Canadian Bill of Rights, etc. Prerequisite: Acceptance into the Advanced Diploma in Business program. 3 credits

**BUSA 6800 Strategic Management —**

*Under development.*

**BUSA 7250 Management Skills and Applications —**

Provides an overview of the basic skills of a manager and applies these skills through a series of projects and case studies. The course begins by examining the evolution of management and the organizational culture and environment. It proceeds to teach skills of decision-making and the skills involved in planning, Organizing, leading, and controlling, including planning and facilitating change, teamwork, applying motivational techniques and effective communication.

**CAD/CAM****CDCM 2270 Program Design in C —**

*Under development.*

**CDCM 2370 Technical Programming I —**

Many problems in technical fields such as CAD and GIS can only be solved by creating custom programs. This course will use the C/C++ programming language and an object oriented approach. Relevant components of the C/C++ language are introduced and discussed along with a number of techniques used in the formulation and development of technical programs. The platform will be Windows NT console and windowed environments. Prerequisite: MECH 1171 or acceptance into post or advanced diploma program.

**CDCM 2372 Database Applications —**

Introduces databases and their terminology. An overview of various data models will be undertaken. Guidelines for designing an efficient database will be presented and used to design a relational database applications for Windows using a commercial database package will be presented. Structured Query Language (SQL) will be covered and used to conduct complex queries. Prerequisite: MECH 1171 or acceptance into post or advanced diploma program.

**CDCM 3305 CAD Graphics 3 —**

Covers 2D and 3D graphics using Microstation software.

**CDCM 3375 CAD Customization I —**

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 2201 or CDCM 3500\* (\*may be taken as a corequisite).

**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 Technical Programming 2**

— Introduces and discusses advanced components of C/C++ that are needed for solving technical programs, along with a number of techniques used in the formulation and development of technical programs. Topics include file I/O, structures dynamic memory allocation, inheritance and function overloading. Projects include reading of data files produced by CAD and GIS software, windows programming using visual development tools, and handling multiple source files. Prerequisite: CDCM 2370.

**CDCM 3472 CAD/Database Applications**

— Investigates the integration of non-graphic data with CAD drawing files. Covers 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 2201.

**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. Designed to give students experience in 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 4405 CAD Graphics 4** — Covers computer generation of 3D models using wireframe, surface and solids modeling software. Examines the creation and generation of shaded models and animation for engineering applications. Prerequisite: MECH 2201 and MECH 3305.

**CDCM 4470 Technical Programming 3**

Introduces several of the Microsoft Foundation Classes (MFC), including the widely used Data Access Objects (DAOs) for accessing databases. Furthermore, advanced features of object-oriented programming such as function overloading and operator functions will be covered. Arrays of pointers, stacks, queues and linked lists will also be studied. 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**

Integrates skills in graphics, programming, databases and engineering technology and applies them to industrial purposes.

**CDCM 4600 Advanced CAD Graphics**

Covers computer generation of 3D models using wireframe, surface and solid modeling software. Students will create and generate shaded models and animation for engineering applications. Prerequisite: AICO 3000 or CDCM 3500 and 3505.

**CDCM 4671 CAD Programming**

Covers topics related to CAD programming using the C programming language. Topics include curve and line fitting, calculation of areas, integrals and angles. Also, one dimensional optimization and tridiagonal matrix inversion algorithms will be presented. Basics of machine vision and image matching will also be introduced.

**CDCM 4690 Post Diploma Project**

— Provides students with the opportunity 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.

**CYTOGENETICS****CGLT 5501 Introduction to Cytogenetics**

**Laboratory Technology** — Presents an introductory course with extensive hands-on training, demonstrations and lectures on the principles and methodologies of clinical cytogenetic technology. The student is introduced to the theoretical and practical aspects involved in cell growth and culture as they relate to major tissue culture laboratory procedures. The principles and practical application of various banding techniques are studied. Banded chromosomes are prepared from human tissue types such as amniotic fluid, chorionic villi, fibroblasts and products of conception. Trouble shooting, laboratory safety (MSDS and WHMIS) and group problem-solving are stressed. Cytogenetics syndromes and chromosome abnormalities will be introduced.

**CGLT 5502 Chromosome Analysis and 1995 ISCN Nomenclature, Part I**

— Studies a wide range of metaphase chromosomes in print and microscopic form to introduce students to the human chromosome karyotype. Both abnormal and normal metaphases are examined. Results are described according to the 1995 ISCN (International Standard Chromosome Nomenclature).

**CGLT 5503 Seminar Topics and Presentation, Part I**

— Assigns students topics from the R.T. (Subject, Cytogenetics), Syllabus to research and study in consultation with the instructor and present to the class. Additional topics may be considered if they are relevant to current cytogenetic technology practice.

**CGLT 5504 Darkroom Photography,**

**Introduction** — Teaches students to use darkroom equipment to produce high quality negatives and prints of metaphases taken with a standard Nikon photomicroscope and 35 mm film. Theoretical and practical aspects of equipment, film, paper and chemicals will be introduced.



**CGLT 5505 Technical Assignment — FISH/Tissues** — Students are introduced to the concepts of molecular genetic technology (Fluorescence In Situ Hybridization) and will learn the skills required to perform interphase karyotyping/interpretation of results on fibroblasts, touch preps, and short/long digest of chorionic villi.

**CGLT 5506 Research Project, Tissues** — *Under development.*

**CGLT 6601 Advanced Cytogenetics Laboratory Technology** — Continues from CGLT 5501 with emphasis on high quality banded chromosome preparations. The blood culture techniques that are used reflect clinical site application and standards (350-850 band resolution). Special banding and staining procedures will be emphasized and discussed relative to when and why they are used in clinical cytogenetics. Prerequisite: CGLT 5501.

**CGLT 6602 Chromosome Analysis, 1995 ISCN, Part 2** — Uses a challenging series of prints and slides (450-850 band resolution) will be used to stimulate knowledge gained from lessons and practice in Level 1. Prerequisite: CGLT 5502.

**CGLT 6603 Seminar Topics and Presentation Part 2** — Covers topics from the current cytogenetics/molecular genetic literature as well as aspects of the technology not covered in class.

**CGLT 6604 Darkroom Photography, Advanced Skills** — Covers the organization of all aspects of producing a complete cytogenetics report including photography. Enhancement of the microscopic image reproduced on paper for maximum reproduction is stressed. The student learns the role of the cytogenetics technologist in the photographic darkroom to produce optimal contrasted chromosome reproductions.

**CGLT 6605 Technical Assignment - FISH/ Bloods** — Covers fluorescence in situ hybridization techniques as in CGLT 5505 but this time applied to metaphase preparations from peripheral lymphocytes (fixed) and EDTA/sodium heparin unclotted blood. Interphase karyotyping techniques are applied and interpretation of results are carried out.

**CGLT 6605 Technical Assignment - Part 2, FISH; Research Project Bloods** — Various projects will be assigned to students involving FISH technology. These include XY/XX sexing of human interphase nuclei, fixed lymphocytes (stimulated), microdeletions (eg., Prader-Willi syndrome) and paint probes on human metaphase chromosomes.

**CGLT 6606 Clinical Orientation** — Provides students with the opportunity to spend a decreasing amount of time in formal instruction at the Institute and an increasing amount of time at one of the affiliated hospital cytogenetics laboratories.

**CGLT 6607 Clinical Training** — Assigns students various sub-sections of one of the affiliated cytogenetics laboratories. The clinical experience will vary amongst the major tissue types used for cytogenetic analysis. Productivity expectations will be approximately 80 per cent of workloads for a certified technologist.

## CHEMISTRY

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**CHEM 0010 Introductory Applied Chemistry** — Covers atomic structure, the periodic table, bonding, formula writing and nomenclature, balancing equations and stoichiometry, solutions, acids and bases, introduction to pH and oxidation-reduction reactions. non-credit

**CHEM 1101 Chemistry I for Chemical Sciences** — Includes stoichiometry, nomenclature, chemical equilibrium, acid-base titrations, pH, buffer solutions, solubility product, oxidation-reduction reactions. The application of chemical principles to industrial processes is emphasized. The lab work includes gravimetric, volumetric and qualitative analysis.

**CHEM 1102 Chemistry I for Mining/Petroleum** — Covers topics of inorganic chemistry including atomic structure, chemical formulas, stoichiometry, solution preparation and concentrations, acids and bases, pH, buffer solutions, solubility equilibria, and oxidation and reduction reactions and titrations. The emphasis is on the application of chemical principles in industrial processes, chemical calculations and analysis, and the development of good laboratory skills. Laboratory exercises consists of qualitative and quantitative analysis, and acid-base chemistry.

**CHEM 1103 Chemistry I 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 1108 Chemistry I for Environmental Health** — Presents a general chemistry course for environmental health. Topics include chemical symbols, formulas, acid-base reactions, calculations based on formulas and chemical equations, theory of volumetric analysis, molarity, normality calculations based on concentration of solutions, acid-base equilibria solutions, pH and pOH, buffers and hydrolysis.

**CHEM 1115 Chemistry I for OCHS** — Introduces basic inorganic chemistry. Topics include chemical bonding, stoichiometry, formula writing, solution preparation, oxidation and reduction, acid-base theory, titration calculations and buffer solutions.

**CHEM 1116 Chemistry I for Nuclear Medicine Technology** — Covers topics of general chemistry relevant for the study of the health sciences. It includes stoichiometry, nomenclature, concentrations of solutions (molarity, percent, equivalent weight), oxidation and reduction and acid-base chemistry (strong and weak electrolytes, buffers, hydrolysis of salts). The term ends with an introduction to organic chemistry. As these topics are studied, applications to Nuclear Medicine Technology are emphasized. The laboratory part of the course consists of preparation and use of standard solutions and buffer solutions and use of the pH meter.

**CHEM 1117 Basic Clinical Chemistry** — Begins with basic general chemistry including names and formulas of common inorganic compounds, concentrations of solutions (molarity and percent), acid-base chemistry (strong and weak electrolytes; buffers), oxidation and reduction and electrochemistry. Then the major classes of organic compounds are described. The chemistry and biological function of proteins, lipids, monosaccharides and nucleic acids are explored and the term ends with a description of the structure and function of the neurotransmitters.

**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 changes, 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), electrochemistry (for predicting corrosion in plastics processing equipment) and the behavior of gases, liquids and solids. Laboratory exercises are designed to teach safe working techniques and correct attitude, and include analysis and aqueous reactions.

**CHEM 1128 Chemistry I for ENVT** — Provides an introduction to inorganic chemistry for Environmental Technician students. Topics include chemical bonding and formulas, calculations based on formulas and chemical equations, acids and bases, pH and pOH, volumetric analysis, concentration of solutions, buffers and salt solutions. Specific emphasis will be given to the operation and maintenance of equipment used in this course. Good Laboratory Practice (GLP) and Workplace Hazardous Materials Information System (WHMIS) are also covered.

**CHEM 1205 General and Organic Chemistry for Biomedical Engineering** — Begins with a review of the periodic table followed by a study of the mole, chemical equations and stoichiometric calculations. Oxidation and reduction will then be discussed with reference to balancing redox equations. Solution stoichiometry is then studied. Acid-base chemistry is studied with emphasis on the difference between strong and weak electrolytes and different types of buffer solutions. Electrochemistry is introduced with emphasis on different types of voltaic cells. Then the major groups of organic compounds are considered and the basic physical and chemical properties of each group are described. The laboratory work will acquaint the student with the basic techniques used in chemistry as well as several techniques used in a clinical laboratory.

**CHEM 2201 Chemistry 2 for Chemical Sciences** — Continues from CHEM 1101. Topics include oxidation — reduction titrations, electrochemical cells, electrolysis, electroplating, thermochemistry, electronic structure of atoms, bonding, properties of solids, liquids and gases, colligative properties, co-ordination compounds and organic chemistry. The industrial application of chemical principles is emphasized. The lab work includes qualitative and quantitative analysis. Prerequisite: CHEM 1101.

**CHEM 2202 Chemistry 2 for Mining/Petroleum** — Continues from CHEM 1102 and covers topics of inorganic and organic chemistry. Electrochemistry includes electrochemical cells, applications of electrolysis, electrometallurgy, 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. The physical and chemical properties, structures and names of some organic compounds are also examined. Lab work includes qualitative and quantitative analysis, and separation and purification methods for organic compounds. Prerequisite: CHEM 1102.

**CHEM 2203 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 2204 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; 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. In addition, various solvent extraction, distillation and similar methods will be studied. The course begins with an introduction to sampling procedures. Prerequisite: CHEM 1101.

**CHEM 2208 Chemistry 2 for Environmental Health** — Designed as an organic chemistry course for Environmental Health. Topics include polycyclic aromatic hydrocarbons, volatile organic compounds, organochlorine compounds, alkalinity, hardness, water softening, surfactants, lipids, grease, sanitizing agents, dissolved oxygen, biological oxygen demand, chemical oxygen demand, chlorination, chloramination, ozonation, and swimming pool chemistry. Prerequisite: CHEM 1108.

**CHEM 2215 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 2216 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. The laboratory work acquaints the student with the basic techniques used in organic chemistry and biochemistry. Prerequisite: CHEM 1116.

**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. Derivatives of hydrocarbons including alcohols, halides, phenols, amines, carbonyl compounds, carboxylic acids and derivatives (esters, amides, acid chlorides and acid anhydrides) are presented. Naming, structure, reactions and involvement in the plastics industry is emphasized throughout. 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 2228 Chemistry 2 for ENVT —**

Provides an introduction to organic chemistry and includes a selection of topics of interest to *Environmental Technicians*. Organic chemistry includes: functional group analysis, naming by IUPAC, common and trade names of many commercial chemicals, oil refining and pesticides. Other topics include alkalinity, water hardness, water softening, surfactants, heavy metals poisoning, biological oxygen demand, chemical oxygen demand and selected air quality parameters. Specific emphasis will be given to the operation and maintenance of instruments used in this course. Prerequisite: CHEM 1128.

**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 analyse substances of biological importance (i.e. spectroscopy, chromatography and electrochemistry). Prerequisite: CHEM 1205.

**CHEM 3303 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: MATH 1431, PHYS 1143.

**CHEM 3309 Organic Chemistry I for Chemical Sciences —**

Covers the classification of organic compounds, naming using IUPAC, common and trade names of many industrial chemicals, factors affecting boiling point and solubility, theory of extractions, preparation and reactions of alkanes and alkenes, sources and uses of hydrocarbons, stereochemistry, and structure determination using IR and NMR spectroscopy. Laboratory exercises include the isolation and identification of natural products, qualitative tests for the identification of functional groups, preparation of samples for infrared analysis, and qualitative analysis by gas chromatography. Prerequisite: CHEM 2201.

**CHEM 3310 Physical Chemistry —**

Presents the kinetic theory of gases, the first and second laws of thermodynamics, chemical kinetics and catalysis. Lab work consolidates lecture material and gives experience in practical physicochemical measurements. Prerequisite: CHEM 2201.

**CHEM 3311 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.

**CHEM 3313 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, potentiometry, polarography and chromatography. Prerequisite: CHEM 1108.

**CHEM 3315 Organic Chemistry for OCHS —**

Surveys the various classes of organic compounds likely to be encountered in the workplace. Naming, structure, chemical and physical properties, industrial uses, toxicity and occupational hazards are emphasized. Practical work provides experience with organic compounds and processes. Prerequisite: CHEM 2215.

**CHEM 3320 Polymer Chemistry and Technology —**

Looks at the different ways in which plastics behave during processing and in service performance and how this depends on the polymer which is present; additives and comonomers modify this behavior. Polymer properties include glass transition temperature, crystallinity, crystal melting temperature and molecular weight. 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.

**CHEM 3321 Toxicology for Environmental Health —**

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: CHEM 2208 or equivalent.

**CHEM 3328 Analytical Chemistry —**

Presents the principles and laboratory procedures for the more common instrumental methods of chemical analysis. Spectroscopic methods include visible, ultraviolet, infrared and atomic absorption spectroscopy. Potentiometry, gas chromatography, high performance liquid chromatography, and ion chromatography will also be covered. Specific emphasis will be given to the operation and maintenance of all instruments used in this course. Prerequisite: CHEM 2228.

**CHEM 4409 Organic Chemistry 2 for Chemical Sciences —**

*Continues from CHEM 3309.* Covers naming, properties, preparations and reactions of aromatic compounds, alkyl halides, alcohols, phenols, ethers, aldehydes, ketones, carboxylic acids, esters, amines and amides; organochlorines in the environment; lipids, compounds, isolation and purification techniques, qualitative chemical analysis, and instrumental methods including infrared, ultraviolet and gas chromatography. Prerequisite: CHEM 3309.

**CHEM 4415 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.

**CHEM 4416 Analytical Instrumentation I —**

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. Prerequisites: PHYS 2141, CHEM 2201.

**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.

**CHEM 7313 Analytical Measurements** —

Applies 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, potentiometry, polarography and chromatography. Through projects and laboratory assignments, students have the opportunity to demonstrate teamwork, leadership, problem-solving/critical thinking and communication skills. Prerequisite: CHEM 1108.

**CHEM 8422 Environmental Chemistry** —

Examines the sources and assess the cause 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 to the environment. Students will analyse common environmental pollutants and interpret the results. Prerequisite: CHEM 2208 or equivalent.

## CHEMICAL SCIENCE

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**CHSC 1100 Computer Applications for Chemical Sciences** —

Introduces micro-computer software packages including electronic spreadsheets, databases and graphical methods, with applications to Chemical Sciences Technology.

**CHSC 1103 Engineering Materials I** —

Covers properties and physical testing of materials including metals and alloys. Mechanical behavior concepts such as strength, hardness, toughness, creep, structure/property relationship.

**CHSC 1105 Engineering Materials I** —

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 1106 Engineering Materials**

**Petroleum** — Imparts a basic knowledge of the structure, properties, behavior and application of metals. Terminology and significance of physical testing of metals: tensile testing, hardness, impact, etc. Reasons for metal failure: fatigue, creep, embrittlement. Crystal structure of metals, properties and forming methods of metals, corrosion and nondestructive testing.

**CHSC 1119 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.

**CHSC 1208 Engineering Materials: Wood**

— Presents a comparison of materials important to forest products industries including metals, alloys, polymers and ceramics. Common causes of failure in service including corrosion, wear, fatigue and embrittlement. Lab sessions emphasize physical and nondestructive testing.

**CHSC 1262 Engineering Materials for Plastics Technology** — See CHSC 1105.**CHSC 1284 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 that 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.

**CHSC 1488 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, and ceramics.

**CHSC 2203 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 2205 Engineering Materials 2** —

Continues from CHSC 1105. Prerequisite: CHSC 1105.

**CHSC 2248 Industrial Chemistry I** —

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 3305 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 3311 Pollution Science and**

**Organic Chemistry** — Introduces organic chemistry with applications to industrial pollution problems.

**CHSC 3314 Mineral Processing I** —

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 3318 Chemical Analytical Techniques/Applications I** —

Provides training in an environment which simulates actual working conditions in industry and covers materials related to the syllabus for proficiency examination. Both theoretical and practical aspects of analytical techniques are covered in three components: sampling, classical wet analysis and fire assaying. (6 credits, Chemical Sciences). Prerequisites: CHEM 2201, CHEM 2204.

**CHSC 3320 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.

**CHSC 3330 Pulp and Paper Process Control** — Covers theory and practical applications of process measurements in the pulp and paper industry. Includes basic process control, advanced control strategies, and final control elements. Utilizes four industrial distributed control systems typically found in the pulp and paper industry: Fisher Provox, Foxboro I/A, Bailey Infinet 90, and Honeywell TDC 3000. Hands-on experience will be gained on these systems and applied to real process in the BCIT labs. Prerequisites: none.

**CHSC 3341 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 3342 Industrial Process Fundamentals** — Before suitable measurement and automatic process control strategies can be designed and implemented, a detailed knowledge of the behavior 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.

**CHSC 3346 Pulp and Paper 1** — Designed to equip students with basic testing skills and provide hands-on experience with typical mill unit operations. Prerequisite: CHSC 2248.

**CHSC 3351 Pollution Control** — Examines the hydrocarbon processing industry: air pollution meteorology, fundamentals of waste products treatment and management systems, basic sampling and testing techniques.

**CHSC 3360 Environmental Applications** — Provides up-to-date training in current pollution abatement technologies for air pollutants, liquid wastes and solid wastes as practised in the mining industry. Current abatement practices in the mining industry and mine reclamation practices are also discussed.

**CHSC 3413 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 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 4405 Assaying 2** — Continues from CHSC 3305. Also, environmental chemistry, acid generating potential. Prerequisite: CHSC 3305.

**CHSC 4408 Ore Analysis** — Covers methods for the determination of a wide variety of elements in ores, concentrates, and industrial process streams. Emphasis is 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 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 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. Remediation of contaminated soil sites is also covered. Prerequisite: CHSC 1119.

**CHSC 4414 Mineral Processing 2** — Continues from CHSC 3314. Prerequisite: CHSC 3314.

**CHSC 4418 Chemical Analytical Techniques and Application 2** — Introduces inorganic instrumental analysis techniques in a format that simulates the ways analytical instruments are utilized in industry. This is a configuration of CHSC 3318. Emphasis is placed on the selection of instrumental techniques pertaining to extractive metallurgy, process in pulp and paper, engineering materials testing, industrial chemical processing, environmental control processes, mining, and others. General principles involved in the operation of instruments commonly found in industry are discussed in detail. Students will gain practical experience through work shadowing program by participating in an industry-sponsored practicum or directed studies in each option. Analytical instruments techniques include colorimetric, atomic spectroscopy (absorption emission, fluorescence), X-rays (fluorescence, diffraction), and electrochemical methods (pH, conductivity, DO, etc.). Prerequisite: CHSC 3318.

**CHSC 4420 Unit Project 2** — See CHSC 3320. Provides a field practicum in the laboratory aspects of the program.

**CHSC 4421 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 Unit Operations 2** — See CHSC 3341. Prerequisite: CHSC 3341.

**CHSC 4446 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.

## CIVIL AND STRUCTURAL

**CIVL 1000 Statics** — Presents a thorough introduction to the relationship between applied loads and the resultant support reactions and internal forces developed in statically determinate members and structures. The course is delivered through lectures and problem-solving sessions. Topics include classification of force systems, equilibrium equations, support conditions, freebody diagrams, support reactions, truss analysis by the methods of joints and sections, analysis of machines and pinned plane frames, load, shear force and bending moment diagrams for beams, geometric properties of structural sections.

**CIVL 1001 Graphical Communication I** — Presents an overview of fundamental graphical techniques necessary for plan reading and production of working drawings, and introduces a variety of civil engineering terminology. Subject materials for the course are drawn from the civil engineering industry. Topics include freehand sketching, field sketching, drawing scales and layout, orthographic projects, contour drawings, and geometric constructions. Lettering and linework will be emphasized throughout.

**CIVL 1040 Hydrology** — Presents the basic concepts and techniques needed for watershed analysis and drainage facility design. The course is delivered through assigned reading, lectures, and problem-solving sessions. Basic observation and estimation skills are developed through field assignments or a small field project. Fundamental concepts include rainfall intensity, runoff, catchment area, streamflow, infiltration, mass balance, snowmelt, flood frequency, and the hydrologic cycle. The streamflow estimation procedures presented are the rational method, the unit hydrograph and flood frequency analysis.

**CIVL 1080 Construction Materials I** — Provides the knowledge required to select materials for concrete production, design a concrete mix and conduct quality control tests on concrete and aggregates. The course is delivered through lectures and laboratory sessions. Topics include cements, water/cement ratio, admixtures, concrete properties, manufacturing, placing, finishing, curing, and inspection techniques as per CSA A23.1 and A23.2.

**CIVL 1200 Building Structures I** — Presents a basic introduction to the relationship between applied loads and the resulting support reactions and internal forces developed in statically determinate members and structures. The course is delivered through lectures and problem-solving sessions. Topics include classification of force systems, equilibrium equations, support conditions, freebody diagrams, support reactions, truss analysis by the methods of joints and sections, and load, shear force, and bending moment diagrams for beams. This course lays the foundation for subsequent Building Structures courses.

**CIVL 1220 Civil Technology for Mining I** — Presents a basic introduction to the relationship between applied loads and the resulting support reactions and internal forces developed in statically determinate members and structures. The course is delivered through lectures and problem-solving sessions. Topics include classification of force systems, equilibrium equations, freebody diagrams, support conditions and reactions, truss analysis by the methods of joints and sections, and load, shear force and bending moment diagrams for beams. This course lays the foundation for subsequent civil engineering courses taught to mining students.

**CIVL 2002 Mechanics of Materials** — Presents a thorough introduction to the relationship between applied loads and the resulting stresses and deformations produced in common structural elements. The course is delivered through lectures and problem-solving sessions. Topics include concepts of stress and strain, mechanical behavior of construction materials, elementary design using allowable stresses and factors of safety, analysis of statically determinate and indeterminate axially loaded bars, thermal stresses, bending and shear stresses in beams, shear flow in built-up members, beam deflections, combined stresses, and column buckling. Prerequisite: CIVL 1000.

**CIVL 2004 Civil Computer Applications** — Focuses on the personal computer as an analysis/design tool used to solve routine engineering problems. The course is divided into two parts: the first introduces the student to the BASIC programming language, while the second covers the use of spreadsheet software. Emphasis is placed on computer-assisted solutions to practical civil and structural engineering problems. The course is delivered through lectures and hands-on computer lab sessions. A spreadsheet project is a mandatory component of the course. Prerequisites: CIVL 1000, MATH 1421.

**CIVL 2007 Computer Aided Design I** — Through the medium of computer aided drafting software, and building on the fundamental techniques presented in CIVL 1001, the student continues to reproduce graphics examples for the civil engineering field. The emphasis of this course is on the development of graphical computer skills for communication purposes. Prerequisite: CIVL 1001.

**CIVL 2041 Hydraulics I** — Prepares students to analyse and design pipe-pump systems for water distribution and other purposes, and to analyse the hydrostatic forces on fixed or floating structures. The course is delivered using lectures, reading, assigned problems, and, if possible, laboratory exercises. 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, network analysis, forces in pipes, and basic cost analysis for pipe-pump systems. Prerequisite: CIVL 1000.

**CIVL 2081 Construction Materials 2**

— Divided into two parts: the first part covers asphaltic concrete testing and mix design, while the second introduces the student to the mechanical properties and associated testing of timber, ferrous metals, and structural composites. The course is delivered through lectures and laboratory testing sessions. Prerequisite: CIVL 1080. CIVL 2002 must be taken concurrently.

**CIVL 2160 Elementary Structural Design**

— Provides a general introduction to the design of statically determinate structures comprised of wood and steel. Topics include limit states design philosophy, determination of dead load and live load (snow, occupancy, wind and earthquake) effects according to national standards, design of simple tension and compression members, beams, columns, and beam-columns in both wood and structural steel, in accordance with Canadian design codes. Course is delivered through lectures and problem-solving sessions. Prerequisite: CIVL 2002.

**CIVL 2201 Building Structures 2**

Presents the elementary principles of mechanics of materials and an introduction to timber design. The course is delivered through lectures and problem-solving sessions. Topics include concepts of axial stress and strain, section properties of structural shapes, bending and shear stresses in beams, deflection of beams, column buckling, NBCC gravity and wind loads, limit states design philosophy, and preliminary sizing of decking, beams, columns, and beam-columns using the CWC wood design manual. Prerequisite: CIVL 1200.

**CIVL 2221 Civil Technology for Mining 2**

— Presents a basic introduction to the relationship between applied loads and the resulting stresses and deformations produced in common structural elements. The course is delivered through lectures and problem-solving sessions. Topics include geometric properties of structural sections, concepts of stress and strain, mechanical behavior of construction materials, elementary design using allowable stresses and factors of safety, analysis of statically determinate and indeterminate axially loaded bars, thermal stresses, bending and shear stresses in beams, deflection of beams, combined stresses, and column buckling. Prerequisite: CIVL 1220.

**CIVL 2222 Civil Technology for Mining 3**

— Presents an introduction to geotechnical engineering with an emphasis on tailings disposal. Topics include rock slope stability, soil mass/volume relationships, classification, compaction, and permeability. A tailings dam design project considering quantity takeoff, feasibility, pond life, and alternate sites forms a major component of the course. Prerequisite: CIVL 2221.

**CIVL 2223 Civil Technology for Mining 4**

— Presents the fundamentals of hydrostatic pressures and water distribution systems, with an emphasis on mining applications. The course is delivered using lectures, assigned problems, and reading. Topics include fluid properties, hydrostatic pressure, continuity, Bernoulli's equation, pipe flow and friction, head losses, pump characteristics and selection, flow conditions, and open channel flow in flumes and streams. Prerequisite: CIVL 1220.

**CIVL 3005 Highway Design Basic**

Provides the knowledge required to prepare preliminary drawings and design notes for highway construction. Using a British Columbia location, students will choose an alignment within a corridor and prepare a short bill of quantities based on a preliminary design. Horizontal and vertical alignment elements will be designed with the aid of computer software. Using typical sections and digitized ground data, students will interactively adjust alignment elements to achieve an earthworks balance and analyse the resulting mass-haul diagram. Prerequisites: CIVL 1040, 2003, 2004.

**CIVL 3006 Highway Design** — Provides the knowledge required to complete the preliminary design of a rural highway in British Columbia. Working in groups, students will carry out project route planning, establish curve radii, spiral lengths, curve data, stations, development of superelevation, centerline profile, vertical curve elements, typical section details, and drainage details. Using software, students will optimize earthworks by manipulating input files for vertical alignment, section details and superelevation, and by analysis of the resulting mass-haul diagram. A set of preliminary working drawings and a short bill of quantities will be prepared. Prerequisites: CIVL 1040, 2003, 2004.

**CIVL 3007 Computer Aided Design 2**

Presents the use of AutoCAD as a graphical tool for solving civil engineering problems. This is a design course in which students study a variety of techniques employing LISP routines and ATTRIB EXTRACT for transfer of design data out of AutoCAD, and DXFIN facilities for transfer of design resultants into AutoCAD. Course project topics include highway horizontal alignment design, tailings dam design, Hardy-Cross pipe network analysis, and structural layout. Prerequisites: CIVL 1000, 2004, and 2007.

**CIVL 3015 Construction I** — Provides the student with the knowledge necessary to estimate and control construction activities for a typical civil engineering project. The course material is delivered through lectures, videos, assignments, and group projects. A local construction project is used as the vehicle for presenting the course material. Topics include construction equipment, planning, quantity takeoffs, productivity rates, costing, and construction inspection. Prerequisite: Completion of first year or department approval.

**CIVL 3042 Hydraulics 2** — Presents fundamental concepts required for the analysis and design of open channel systems with steady flow. Topics include normal flow (the Manning Equation), energy principles, calculation of varied flow profiles, control structures, and storage routing. Practical applications of the material include natural and man-made channels, chokes, culverts, and detention ponds. Prerequisite: CIVL 1040, CIVL 2041.

**CIVL 3081 Soil Mechanics I Basic**

Presents the basic principles of soil mechanics and testing procedures through lectures, problem-solving sessions, and laboratory work. Topics include mass/volume relationships, soil classification, compaction, subsurface investigation, permeability, pressure and head diagrams, effective stress, consolidation, and shear strength. Prerequisites: CIVL 1000, 2041.

**CIVL 3082 Soil Mechanics I** — Presents the basic principles of soil mechanics and testing procedures through lectures, problem-solving sessions, and laboratory work. Topics include mass/volume relationships, soil classification, compaction, subsurface investigation, permeability, pressure and head diagrams, effective stress, consolidation, and shear strength. Prerequisites: CIVL 1000, 2041.

**CIVL 3090 Project Proposal** — Requires students to initiate contact with a registered professional in the Civil Engineering/Construction industry, and formulate an industry-applicable project. The project should involve the investigation of a current, relevant problem for the industry contact. The student is required to submit a project proposal for approval, and is then assigned a faculty advisor for a subsequent course, CIVL 4020, in which the student will produce a finished project. Prerequisite: Completion of first year or departmental approval.

**CIVL 3120 Subdivision Planning** — Provides an understanding of the planning concepts and imposed constraints 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. Requirements of external approving agencies are also considered. Preparation of a subdivision plan considering the viewpoints of the city, the developer, and the engineer, as well as a preliminary cost analysis forms a major component of the course. Prerequisite: CIVL 1001.

**CIVL 3123 Urban Street Design** — Provides the knowledge required to design all elements of a major urban road. Concepts of horizontal and vertical element control, road drainage, intersection design, sidewalks and utility locations will be discussed and utilized to prepare an urban street design. A review of the design process, extent of field information, and the preparation of as-built drawings will conclude the course. Prerequisite: CIVL 2007 and CIVL 2081.

**CIVL 3122 Basic Subdivision Planning** — Provides an understanding of the planning concepts and imposed constraints 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. Requirements of external approving agencies are also considered. Preparation of a subdivision plan considering the viewpoints of the city, the developer, and the engineer, as well as a preliminary cost analysis forms a major component of the course. Prerequisite: Completion of first year or departmental approval.

**CIVL 3161 Structures I** — Builds on the knowledge gained from previous structures courses and introduces the student to more advanced methods of structural analysis and to reinforced concrete design. Topics include statically indeterminate beam and frame analysis using moment distribution and computer structural analysis programs, design of reinforced concrete members for flexure, shear, deflection, and axial loads. A major component of this course is a concrete design project that includes preliminary design, structural analysis, design of beams and columns and detailing of reinforcement. The course is delivered through lectures, problem-solving sessions and project time. Prerequisite: CIVL 2160.

**CIVL 3164 Structural Design General** — Builds on the knowledge gained from previous structures courses and introduces the student to more advanced methods of structural analysis and to reinforced concrete design. Topics include structural analysis of cables and arches, exact and approximate methods of statically indeterminate beam and frame analysis, elementary design of reinforced concrete beams, one-way slabs, columns, footing and retaining walls. The course is delivered through lectures and problem-solving sessions. Note that CIVL 3164 is the final structures course for all students in Civil Options. Prerequisite: CIVL 2160.

**CIVL 3202 Building Structures 3** — Demonstrates elementary structural design concepts for steel and concrete structures, and the use of tables, handbooks and manuals for preliminary sizing of members. The course is delivered through lectures and problem-solving sessions. Topics include fundamental material properties of steel and concrete, steel and concrete structural systems, use of design aids, and lateral force-resisting systems for wind and seismic forces. Prerequisite: CIVL 2201.

**CIVL 4008 Civil Engineering Construction** — Demonstrates how the organization, cost, and sequencing of construction activities for a typical civil engineering project are all interrelated. The course material is covered through lectures, videos, assignments and group projects. A local construction project is used as the vehicle for presenting course material. Topics include construction equipment, planning, Gantt charts, CPM methods, scheduling software, quantity takeoffs, costing, productivity rates, construction inspection and job cost control. Prerequisite: First year completion or departmental approval.

**CIVL 4009 Construction Contract Law** — Introduces the legal aspects of construction contract administration through lectures and construction scenarios. Topics include an overview of the Canadian legal system, contractual responsibilities and relationships between the various parties to a construction contract, bonding, liens and holdbacks, tendering, types of construction contracts, contents of a contract document and the application of typical clauses to construction-related issues. Prerequisite: COMM 3342.

**CIVL 4016 Construction 2** — Provides the student with the knowledge necessary to organize, sequence, and control construction activities for a typical civil engineering project. The course material is delivered through lectures, videos, assignments, and group projects. A local construction project is used as the vehicle for presenting the course material. Topics include construction planning, Gantt charts, CPM methods, scheduling software, and job cost control. Prerequisite: CIVL 3015.

**CIVL 4020 Projects** — After submitting an acceptable project proposal in CIVL 3090, the student is assigned a faculty advisor. The student is required to meet periodically with the faculty advisor and/or the industry contact, and submit the finished project to both the industry contact and faculty advisor. Prerequisite: CIVL 3090 and COMM 3342.



**CIVL 4044 Water Resources** — Introduces the student to a wide range of water resource problems, methods of analysis and solutions. The course material is covered 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 modeling and numerical solution techniques are reviewed. Prerequisites: CIVL 1040, 3042.

**CIVL 4083 Soil Mechanics 2** — Applies the knowledge gained in CIVL 3082 to a variety of geotechnical, foundation, and drainage design problems through lectures, problem-solving sessions, and small projects. Laboratory testing is completed near the beginning of the course. Project topics include seepage studies, stability analysis of slopes, earth pressures, retaining structures, and foundations. Prerequisite: CIVL 3082.

**CIVL 4084 Soil Mechanics 3** — Presents a variety of more advanced topics in geotechnical engineering using lectures, problems, projects, guest lecturers and field visits. Topics include deep foundations, tailings dam design, rock mechanics, subsurface investigation, pressuremeters, surface waves, and liquefaction. Prerequisite: CIVL 4083.

**CIVL 4122 Municipal Services** — Provides the requisite knowledge for the design of storm and sanitary sewers, and water distribution networks for residential subdivisions. Using current design criteria and commercial software packages, students will prepare detailed designs for each of the services. Emphasis will be placed on preparation of plan and profile working drawings, and design calculations to industry standards. Prerequisites: CIVL 1040, 3007, 3008.

**CIVL 4162 Structures 2** — Investigates concepts of overall structural system design through consideration of formwork/falsework and a small commercial building. The course is delivered through lectures, problem-solving sessions and group project sessions. Topics include proprietary formwork/falsework products, scratch-built wall and slab forms, gang forms, shoring/reshoring of multi-storey building slabs, timber connections, an introduction to masonry wall design, and lateral force-resisting systems for wind and seismic loads. Prerequisite: CIVL 3161.

**CIVL 4163 Structures 3** — Builds on knowledge gained from previous structures courses and introduces the student to more advanced concepts in the areas of mechanics of materials, structural analysis and structural steel design. Topics include torsion of open and closed sections, unsymmetrical bending of beams, inelastic behavior of beams, plastic analysis and collapse mechanisms of beams and frames, energy methods of structural analysis, design of structural steel building frames and background theory to various design code clauses in CAN/CSA S16.1. The course is delivered through lectures, problem-solving sessions and group project sessions. Prerequisite: CIVL 3161 or 3154, CIVL 4162\*. (\* may be taken concurrently)

**CIVL 4166 Structural Detailing** — Presents the theory and code requirements to design and detail structural steel connections. The course is delivered through lectures and problem-solving sessions. Topics include design of bolted and welded connections for beams, columns, and bracing members, production of shop drawings for fabrication of structural members using manual and computer-aided drafting, and framing and erection methods. Prerequisites: CIVL 3007, 2160.

**CIVL 4203 Building Structures 4** — Presents an overview of a variety of civil engineering subject areas that will enhance Building Engineering Technology graduates' ability to comprehend and discuss concepts with civil engineers. Topics include earthquake engineering, reinforced masonry, prestressed and post-tensioned concrete, concrete formwork, soil classification, soil compaction, effective stress, footing design, and retaining walls. The course is delivered through lectures and problem-solving sessions. Prerequisite: CIVL 2201.

## CONSTRUCTION MANAGEMENT

### CMGT 7100 Construction Project

**Controls 1** — Begins the first part of a three part series of courses covering the scope, time and analysis of construction costs, or what is commonly called Project Controls. This particular course will cover many aspects of task and time scheduling for construction projects using computer software as an aid in developing, monitoring and controlling construction projects. Topics include activity inter-relationships, milestones, task duration and risk and the management of float time. Microsoft Project 4 will be used to demonstrate application of suitable software. Prerequisite: Acceptance into this degree program or by departmental approval.

### CMGT 7110 Construction Project

**Controls 2** — Continues with the second part of this three part series on Project Controls. Emphasizes the cost and accounting aspects of construction projects. Building on the prerequisite course material, participants will initially prepare summary reports for tasks and resource pools, critical path analysis and work progress tracking. Project costing and cost reports for sub-projects, or multiple projects, and its relationship to the overall schedule and cost requirements will then be covered. Prerequisite: CMGT 7100.

### CMGT 7120 Construction Project

**Controls 3** — Concludes the series on Project Controls. Participants will be shown how to use schedules for claim preparation. More advanced techniques such as expert systems will be reviewed and discussed. The use of software such as Primavera will be used in a lab setting to develop and simulate these skills. Prerequisite: CMGT 7110.

### CMGT 7140 Construction Statistics 1

Statistical techniques are used in the construction sector to analyze business and engineering data. In preparation for the application of enumerative and analytical statistics, participants will be shown how to approach the design of the data collection process and adopt standard formats for the presentation of statistical data. The course will conclude with the application of probability and distribution methods to data analysis. Prerequisite: CMGT 7100.

**CMGT 7150 Construction Statistics 2**

— Follows upon course on Construction Statistics. Participants will be shown the relevance of sampling and estimating, linear regression and correlation with particular emphasis on the interpretation of construction test results. The application of these methods and techniques to business forecasting and quality management will complete this course. Prerequisite: CMGT 7140.

**CMGT 7200 Management of Construction Equipment and Plant 1**

— The selection, efficient utilization and cost-effectiveness of major construction operations (such as earthmoving, lifting, transporting, etc) has a significant impact on the overall cost and duration of construction activities. This course will review and discuss the operational parameters of many of these operations. This will also include the determination and management of equipment operating costs. Prerequisite: CMGT 7120.

**CMGT 7210 Management of Construction Equipment and Plant 2**

— Analyses development of equipment maintenance systems and the options as to whether to buy, rent or hire equipment. Discussion on the need for equipment operator and mechanic training programs will complete this course. Construction managers should be able to develop systems and procedures for the efficient management and maintenance of construction equipment and plant. Prerequisite: CMGT 7200.

**CMGT 7220 Health and Safety in Construction**

— Reviews the role of key stakeholders involved in health and safety issues in construction. Sessions will include: Role of Workers' Compensation Board; accident prevention on the construction site; protection of the public; health hazards and the cost of accidents in construction. Prerequisite: Acceptance into this degree program or by departmental approval.

**CMGT 7230 Quality Assurance and Control 1**

— Begins as a three part series on the development and implementation of a quality assurance (QA) plan for a construction project. After an overview of QA systems, the economic benefits and the administrative aspects of developing a quality assurance plan will be discussed in detail. This will include development of policy statements for program implementation and the preparation of estimates of time and cost for the various components. Reference will also be made to bench marking of auditing tools that will aid in assessing formal comparisons with peer groups in industry. Prerequisite: CMGT 7120 and 7150.

**CMGT 7240 Quality Assurance and Control 2**

— Continues the series, showing participants how to apply the aspects gained in CMGT 7230 to the development of a QA plan and the setting up of organizational responsibilities of such a QA program. This will include the preparation of quality objectives and the development of administrative procedures for design controls. The course will conclude with discussion on the differentiation between the various organizational responsibilities necessary for the implementation of a QA Program. Prerequisite: CMGT 7230.

**CMGT 7250 Quality Assurance and Control 3**

— Concludes the series and covers the elements of a QA program such as material control, testing and evaluation, and identification and resolution of non-complying conditions. Also included will be the maintenance of QA records, the development of control charts for variables (eg. population vs. samples) and the utilization of control chart functions and process capability for analytical purposes. Prerequisite: CMGT 7240.

**CMGT 7300 Construction Finance 1**

— Illustrates the transition of the project estimate, prepared for bidding purposes, to the cost control system required to ensure profitability. In this 1st part, emphasis will be placed on developing a cost control system and its implementation into the daily management of projects. Discussion on the preparation of estimates/budgets that are conducive to job cost control, utilization of cost baselines and the projection of cash flow and balances will complete this section. The challenges of determining if a project is staying within budget are critical in today's fiercely competitive environment. Prerequisite: CMGT 7120 and 7150.

**CMGT 7310 Construction Finance 2**

— Builds upon the strategies covered in the prerequisite course. New topics will include the development of variance assessment techniques and the preparation of financial projections and forecasts to completion costs. The application of engineering economic analysis will then be demonstrated in order to analyze financial decisions. Prerequisite: CMGT 7300.

**CMGT 7320 Construction Finance 3**

— Concludes the presentation of material for those who want to develop methods for monitoring and controlling costs of construction projects, while emphasizing the importance of a proactive approach to corrective actions. The relationship of cost control systems to the financial accounting of the organization as a whole will then be illustrated. This will require the preparation of a schedule of values and cash income curves as well as cost and production curves to aid in projecting project payroll requirements and the utilization of cost loaded network schedules. The use of software such as MS Project 4/Primavera will also be incorporated as tools to aid in these cost assessments. Prerequisite: CMGT 7310.

**CMGT 7420 Construction Law and Ethics 1**

— Begins with a basic review of the legal principles and then examine the provisions of the standard contract (CCDC2) which deals with those issues. After an analysis of the project type, the appropriate form of standard contract will be selected together with an interpretation of the limitation periods and other procedural requirements. The role of the consultant as both the owner's agent as well as an independent arbiter of the contract will be contrasted. Prerequisite: Acceptance into this degree program or by departmental approval.

**CMGT 7430 Construction Law and Ethics 2**

— Reviews case histories that deal with the disputes that illustrate the basic principles of contract law. The principles and procedures under the Builders' Lien Act of BC will be critically reviewed. Issues relating to surety bonds, insurance law and the protection of a contractor's (or owner's) right to assert a delay claim will also be discussed. A comparison of the advantages and disadvantages of the different dispute resolution methods used in B.C. will conclude this course. Prerequisite: CMGT 7420.

**CMGT 7530 Leadership and Interpersonal Skills** — Provides current or potential team leaders and managers with the essential skills to manage a diverse workforce in the construction workplace. Participants will be introduced to factors influencing performance, personality, culture and organizational norms, as well as the practical application of modern management concepts and techniques. Skills development will be achieved through a variety of training interventions including lecture, casework and discussions. In addition, a computer-mediated simulation will provide exposure to participants, working in teams, to typical decisions required of a manager in realistic, real-time environment. Extensive feedback will be provided to participants on the real implications of their decisions. Prerequisite: BUSA 7250.

**CMGT 7600 Industrial Relations in Building Construction 1** — Covers employment and collective bargaining legislation as well as the maintenance of collective agreements and the management of industrial relations. This 1st course will analyze (i) how employment standards legislation impacts on the collective bargaining environment and (ii) the impact of collective bargaining on different models of organizational structure. This course will conclude with discussion of open and closed shop work environments. Prerequisite: CMGT 7420.

**CMGT 7610 Industrial Relations in Building Construction 2** — Continues from CMGT 7600. The construction manager will become involved in the management of industrial relations in the modern workforce. This second course will discuss the relationship of labor relations associations and their involvement in the collective bargaining process. It will also relate the management of construction trades and professionals to the evolving construction environment. There will also be a review and discussion of current B.C. labor legislation, both contemplated and existing. Prerequisite: CMGT 7600.

**CMGT 7640 Environmental Issues in Construction 1** — Provides the construction manager with skills and knowledge to manage construction operations so as to minimize the negative impact on the community and the environment. With the ability to access relevant regulations, managers will be able to ensure that clearing and waste disposal operations are conducted with due consideration, recycling of waste products are integrated into the project and that transportation and stockpiling of materials are organized so as to minimize impact on the environment. Prerequisite: CMGT 7610.

**CMGT 7650 Environmental Issues in Construction 2** — Broadens the construction managers knowledge of environmental issues related fire and toxic hazards, particularly when emergency measures are necessary in the event of an accident. Also included will be issues related to noise control and an analysis of liability in different situations. Prerequisite CMGT 7640.

**CMGT 7800 Project Reports** — Intended for the preparation of the final report for the Industry Sponsored Project, this course will provide the basis and format for all technical reports required in the program. Emphasis will be placed on the overall structure, organization of information and the logical progression of concepts. This course should be completed at an early stage in the program. Prerequisite: CMGT 7100.

**CMGT 7820 Project Proposals** — Intended to be taken just prior to completion of the program. Having selected your industry sponsor/research project topic, this course will help you conduct the necessary literature review to clearly define the problem and to prepare an effective proposal for submission to the department. Approval by the department is required prior to proceeding with the project. Your industry sponsor is expected to provide occasional guidance and support relating to this activity. Prerequisite: CMGT 7800.

**CMGT 7840 Technical Presentations** — Allows participants to analyze the need of your audience and then integrate your objective to the content and audience. Video feedback will be used extensively to provide immediate and practical comments as you develop comfort and confidence in business presentations. The ability to make an effective business presentation is now more essential than ever for individuals wanting to advance in their careers. Prerequisite: CMGT 7100.

**CMGT 8200 Special Techniques for Large Construction Projects 1** — Develops the technical skills required to select and manage construction techniques common on large projects. Initial topics in this course will include case studies on the management of large projects as well as various design-build options. Emphasis will then be placed on major excavations, backfilling and sheet piling operations. Prerequisite: CMGT 7210, 7220 and 7250.

**CMGT 8210 Special Techniques for Large Construction Projects 2** — Emphasizes the management of sub-soil dewatering operations, piled foundations and the construction and removal of temporary retaining structures. Many major construction projects also require the construction and removal of temporary diversion structures. Management strategies associated with these diversion structures and related traffic control systems will also be presented. Prerequisite: CMGT 8200.

**CMGT 8220 Special Techniques for Large Construction Projects 3** — Emphasizes the selection and management of temporary structural support systems for buildings and steel framed structures. Scaffolding systems, formwork operations, special formwork and falsework techniques will be discussed. The course will conclude with a detailed review of steel frame and roof truss erection procedures. Prerequisite: CMGT 8210.

**CMGT 8430 Management of Construction Enterprise 1** — Introduces the primary elements of the management of a construction enterprise including the initial set-up of a construction company, getting work and managing its day-to-day operations. This will also require the management team to develop a marketing plan for the company as well as developing a financial plan that includes procurement, financing, cash flow and risk analysis. The course will conclude with the overall submission and negotiation of a construction bid. Prerequisite: CMGT 7320, 7430 and 7250.

**CMGT 8440 Management of Construction Enterprise 2** — The management of corporate operations requires that the management team effectively manage cash flow and risk. As part of their responsibilities, construction managers should be able to effectively relate with internal and external stakeholders. This course will address these issues as well as the effective and efficient allocation of resources and still be able to manage site and office operations with respect to legal requirements. Prerequisite: CMGT 8430.

**CMGT 8450 International Construction Management** — Introduces special considerations in the management of an international construction project, including logistical and cultural implications. Guest lecturers will present topics based on their own experience and illustrated with case studies. Prerequisite: CMGT 8440.

**CMGT 8600 Management of Project Stakeholders** — Provides current or potential project leaders and project team members with a comprehensive overview of internal and external stakeholder groups involved in a construction project. Various external stakeholder groups will be identified including community groups and special interest groups. Case studies will be utilized to demonstrate the potential impact of projects on these groups. Computer mediated simulation will also be used to provide real-time feedback on decisions made during teamwork exercises. Prerequisite: CMGT 7530 and 8440.

**CMGT 8800 Applied Research Project** — Designed as the capstone activity for the program. In conjunction with an industry sponsor, the participant will apply their specialty knowledge in solving a management related problem directly associated with the construction sector. This major program activity is expected to contain some elements which are deemed to be innovative, experimental or exploratory in nature. The department will form a committee to evaluate and approve each project proposal and will provide occasional guidance as appropriate. Feedback from the industry sponsor will be actively encouraged. Prerequisite: CMGT 7820 and departmental approval.

## COMMUNICATIONS

**COMM 0007 Introductory Communication for ETE** — Emphasizes reading, writing, speaking 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 efficient reading, library research skills, reading comprehension and study skills. A grade of less than 65 per cent is a failing grade. A grade of 65 per cent to 69 per cent meets the English 12 with a P entrance requirement. A grade of 70 per cent to 74 per cent meets the English 12 with a C entrance requirement. A grade of 75 per cent or better meets the English 12 with a C+ entrance requirement. This course is equivalent to COMM 0005 or COMM 0008 which are offered through Part-time Studies.

**COMM 1100 Business Communication I** — 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 1101 Communication I Senior Technicians** — *Under development.*

**COMM 1112 Communication for Broadcasters I** — 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 1114 Business Communication I 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 1135 Introduction to Technical Communication** — Teaches the style and organization of clear technical writing. Students write letters and memos, process descriptions and instructions, and design graphics relevant to the program area. An oral presentation is required.

**COMM 1140 Technical Communication for Building** — *Under development.*

**COMM 1143 Technical Writing I for Electronics** — 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.

**COMM 1144 Communication I for BIOT/FOOD** — 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 1145 Technical Communication I 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 1149 Technical Communication I** — Teaches the basic skills needed to become effective writers and speakers in the mechanical industry. Students learn the layout, content and graphic techniques of technical writing, as well as research methods and employment application techniques. Students write technical memos, letters and descriptions, and give an oral report.

**COMM 1164 Technical Writing I 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 1178 Technical Writing I 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 1180 Communication/Applied Research** — Introduces technical communication, an overview of the fundamentals of applied research and word processing software and hardware to Electroneuro-physiology students. Oral and written technical communication skills plus 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 1184 Technical Writing I 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 1186 Communication and Applied Research I** — 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 1188 Communication I 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 1198 Communication I for ENVT** — Introduces Environmental Technician students to professional writing skills as applied to technical reports, memorandums, and letters. Also included are sections on job search skills and meeting procedures.

**COMM 1282 Communication I for Environmental Health** — Teaches how to be a professional and efficient communicator at work. Topics include: effective memos and letters, delivering an informative oral presentation, and technical instructions and descriptions. In the workplace, Environmental Health Technology (EHOs and PHIs) spend time each day communicating with co-workers, supervisors, operators, and clients.

**COMM 1372 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.

**COMM 1376 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.

**COMM 1474 Communication for Nuclear Medicine Technology** — Introduces students to the communication needs of the nuclear medicine profession with regards to communicating with supervisors and patients. This course includes organizing and explaining information, oral and written reporting, and resume writing.

**COMM 1910 Communications I** — Provides students with confidence in their ability to communicate effectively. You will have developed a questioning approach and have the skills necessary to obtain and use relevant information to solve problems, listen actively in interactions with others, express your ideas effectively both in writing and in oral presentations, demonstrate effective use of: interpersonal, intercultural, reading, team and leadership skills. (Note: Only students enrolled in the Applied Operations Management Senior Certificate can register for this course.)

**COMM 2200 Business Communication 2** — Provides 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. The course also includes modules on graphics, questionnaires, telephone techniques, organizing and running meetings, and using word processing. Prerequisite: COMM 1100.

**COMM 2201 Communication 2 Senior Technicians** — Prerequisite: COMM 1101.

**COMM 2212 Communication for Broadcasters 2** — Continues from COMM 1112. This course focuses on the unique demands 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 2214 Business Communication 2 for Computer Systems** — Continues from 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.

**COMM 2235 Technical Communication 2** — Covers the preparation of various kinds of industry-related reports and proposals, make persuasive oral presentations, participate effectively in meetings, and develop effective job-search skills.

**COMM 2242 Technical Communication for Civil and Structural** — Covers the writing of job application letters and resumes and teaches about job interviews. Students also write short progress, incident, trip and inspection reports common in the Civil and Structural field. They also practise oral reporting. Prerequisite: COMM 1135.

**COMM 2244 Communication 2 for BIOT/FOOD** — Enables students to put together a career package, take part in meetings, and give a persuasive oral presentation in front of a panel.

**COMM 2443 Technical Writing 2 for Electronics** — Prepares a professional job search package, practise interviewing skills, write informal reports, and prepare a substantial formal report. They also learn techniques and formats for documentation, and do technical briefings. Prerequisite: COMM 1143.

**COMM 2245 Technical Communication 2 for Renewable Resources** — 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 documentation skills. Prerequisite: COMM 1145.

**COMM 2251 Technical Communication 2 for Surveying** — Teaches the fundamentals of job seeking, meeting and reporting. Students also present 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.

**COMM 2255 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 2264 Technical Writing 2 for Robotics** — Introduces advanced technical writing techniques and principles. In labs students write industry-oriented reports and give technical briefings. They prepare proposals, progress reports and documentation describing the project designed and produced for ROBT 4491. They also write a resume and application letter and prepare for and hold meetings and interviews. Students enrolled in COMM 2464 must be concurrently enrolled in ROBT 4491. Prerequisite: COMM 1164, ROBT 4491\* (\*must be taken concurrently).

**COMM 2278 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 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 participating in a persuasive meeting participant. Some assignments may be done jointly with other courses. Prerequisite: COMM 1180.

**COMM 2284 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.

**COMM 2287 Communication and Applied Research 2** — Continues from COMM 1186. Prerequisite: COMM 1186.

**COMM 2288 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 2382 Communication 2 for Env Health** — Builds on the skills learned in COMM 1282 and adds writing informal reports including inspection, investigation, and progress reports. It also covers proposals, formal reports, and meetings in preparation for the industry project and research courses. Topics include application letters, resumes, and interviews. Prerequisite: COMM 1282.

**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 integral parts 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 practise the reporting techniques used in the engineering mechanical industries. They write feasibility reports, proposals, memos, letters, comparison and progress reports and a formal report. They also present an oral technical report. Prerequisite: COMM 1149.

**COMM 2910 Communications 2** — Continues from COMM 1910. (Note: Only students enrolled in the Applied Operations Management Senior Certificate can register for this course.)

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

**COMM 3312 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 3342 Technical Communication 3 for Civil and Structural** — Allows students to analyse 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 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 3345 Advanced Technical Communication 3 for Forestry** — Allows students to review and practise 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 3346 Advanced Technical Communication 3 for Wood Products Manufacturing** — Allows students to review and practise 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 practise illustrating, revising and editing skills, and presenting an oral technical report. Prerequisite: COMM 1135, 2246.

**COMM 3350 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 3353 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 practise 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 3388 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 3394 Communication for TTED** — Emphasizes practical communication skills for those in technical fields and “English Across the Curriculum” applications.

**COMM 3444 Communication 3 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. Prerequisite: COMM 2244.

**COMM 3478 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.

**COMM 4412 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.

**COMM 4442 Technical Communication 4 for Civil and 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.

**COMM 4444 Advanced Communication for Biotechnology** — Teaches students how to do up-to-the-minute research in biotechnology, critically analyse the results of that research and present the results in a seminar.

**COMM 4445 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 writing and revising skills in a Forestry Engineering Research Report. Prerequisite: COMM 1145, and 2245 or 2253 and 3345 or 3353.

**COMM 4446 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.

**COMM 4450 Advanced Technical Communication 4 for Mining** — Allows students to update their job search packages and write advanced analytical reports and proposals that 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.

**COMM 4453 Public Information Techniques for Fish, Wildlife and Recreation** — Students study and practise techniques for communicating with the public and media about FWR issues. They write a public relations plan and promotional materials such as news releases, brochures and materials for interpretive educational programs. Students design and construct visual displays and give community briefings on controversial issues in FWR. Prerequisite: COMM 1145 and 2245 or 3345, 3353.

**COMM 4488 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 analyse data before reporting their findings in a professional SPR. Prerequisite: COMM 3388.

**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.

## COMPUTER SYSTEMS

**COMP 0107 Computer Literacy** — Uses lecture and hands-on computer time to give an understanding of computer terminology, hardware, components, and software applications. Practical exercises focus on Windows-based file management, word-processing, and spreadsheets.

**COMP 1100 Enhanced Learning Skills** — Assists new Computer Systems students in increasing their success at BCIT. The course covers skills in retention, time management, reading, test taking, note taking, report writing, oral presentation and planning, and portfolio development.

**COMP 1104 Introduction to Computing** — Uses lecture and hands-on computer time to give an understanding of computer terminology, hardware components and software applications. Practical exercises focus on Windows-based file management, word-processing, spreadsheets (Excel), and special topics pertaining to the specific technology program.

**COMP 1107 Computers Applications in Broadcasting** — Develops skills in word-processing, spreadsheets, and database using Windows-based software. Also includes the use of Internet features such as WWW, search engines, news groups, web chat and integration with other business applications.

**COMP 1130 Computer Applications** — Emphasizes the use of computers to solve problems related to Wood Products Technology. Topics include how a computer works, recognizing problems suitable for computer solution, IBM DOS, and communicating with computer personnel. Uses Windows based software for modeling and problem-solving.

**COMP 1135 Computer Applications** — Introduces computer hardware components and programming principles using BASIC. Using IBM DOS and Microsoft Windows to teach system commands. Includes the use of Windows based spreadsheet software to solve problems in the petroleum field.

**COMP 1510 Programming Methods** — Provides 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 1525 Introduction to Object Oriented Programming with Java** — Provides exposure to the JAVA Application Programming Interface (API) includes: java.applet, java.io, java.lang, java.text, java.awt (Abstract Window Toolkit) and more. Event driven programming, exception handling and use of user interfaces in a Windows environment are explored. Requires a knowledge of Pascal programming or a similar structured language. Students should feel comfortable working with nested loops and condition statements and be familiar with data types and variables.

**COMP 1710 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, power programming and includes an introduction to and objects8. Includes extensive hands-on lab work related to lecture material.

**COMP 1900 Business Computer Skills** — Uses lecture and hands-on computer time to develop skills in Windows-based file management, word-processing, spreadsheets, and presentation graphics. Also includes using the Internet as a gateway to computer conferencing.

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

**COMP 2125 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.

**COMP 2135 Computer Applications 2** — Introduces Windows based database and presentation graphics so students can compile a professional presentation incorporating text, graphics, spreadsheets and charts. Includes software integration, preparing and delivering a presentation, and organizing and updating a relational database. Prerequisites: COMP 1135, PETR 2201, PETR 2202.

**COMP 2140 Linear Programming** — Presents linear programming using manual and computer assisted methods to solve problems, computer forecasting models, sawmill simulation software and its application, and database techniques using Windows based software. Prerequisite: COMP 1130.

**COMP 2181 Computers and Information Systems** — Uses lecture and hands-on computer time to give an understanding of computer terminology, hardware components and software application in business. Includes the impact of computer networking and use of the Internet as a business tool. Practical exercises focus on Windows-based file management, word-processing, presentation graphics, and use of the Internet.

**COMP 2510 Procedural Programming in C** — Provides a complete coverage of the C programming language with a focus on the implementation of common algorithms. Topics covered include: creation of various file types, and dealing with dynamic memory including self-referential structures such as trees and linked lists.



**COMP 2530 Visual Tools** — Builds on previous programming courses with an emphasis on good programming techniques, interface design and testing procedures. Follows on from COMP 1510 (Programming Methods) furthering students' knowledge of Object Oriented programming and GUI design using Rapid Application Development (RAD) tools. Students will be taught to use one of the current RAD tools available in order to create programs for the Windows 95 operating environment. Students will complete a number of smaller assignments as well as one larger project.

**COMP 2710 Systems Analysis and Design** — Covers systems development life cycle, starting a project, preliminary investigation, systems requirements, fact finding techniques, data flow concepts and diagrams, data modeling, 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.

**COMP 2720 Computer Organization/Architecture** — Covers 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 1113.

**COMP 2750 Introduction to Decision Systems** — Provides an overview of the use of computers to assist management in short and long run decision-making for planning and control. Topics include decision theory, inventory models, simulation and linear programming, as well as the behavioral aspects of implementation of computer models. Prerequisite: OPMT 1133.

**COMP 3110 Networks and Current Developments** — Familiarizes students with concepts, components, topologies, and operations of Wide and Local Area Networks. Topics include introduction to Local Area Network operating systems; new development in the computer network field; and effects of new technology on business and society. Students are prepared for Local Area Network support positions in small to medium sized organizations.

**COMP 3151 Software Engineering** — Provides students with an understanding of software engineering on a variety of levels. Topics include: basic microprocessor/computer architecture, software development methodology and tools, assembly language programming, and C programming. If time permits, elements of scientific algorithms and real-time programming will also be included. The goal of this course is to give the student an in-depth view of software engineering starting from the hardware level building up to the use of high level programming languages. Prerequisites: Math 1151, BMET 2215.

**COMP 3511 Object Oriented Programming with C++** — Covers a paradigm in programming which deals with classes and objects. Most features of the C++ language will be covered including: polymorphism, templates, persistence, and exception handling.

**COMP 3710 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. Students design, load and update a relational database. Prerequisite: One of COMP 2615, 2710 or 3620.

**COMP 3720 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. Network throughput performance analysis. Issues in Network design, routing, flow and congestion control. Digital Modulation schemes. Error detection/Correction algorithms. Prerequisites: COMP 2720, COMP 2510.

**COMP 3730 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 3765 Issues in Networking** — Covers communication between computer; networking theory and practice; distributed processing with special emphasis on micro-computers; software management of Local Area Network systems; and, theory of ETHERNET and ISO standards.

**COMP 3900 Computer Projects Practicum I** — 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 Introduction to Information Technology Management** — Investigates design and implementation of large software systems for the business community. The emphasis is on transaction processing systems such as payroll, A/R, inventory, POS, human resources, and shipping/receiving. Students perform numerous case studies which explore alternative solutions to real life IS problems. The programming component of this course introduces Visual Basic, DAO, and MS Office Integration. Students use these technologies to develop small business applications. Prerequisite: Completion of first year.

**COMP 3920 Database Systems I —**

Continues from COMP 3710 for students who have a special interest in database technology. Topics include: the importance of data in an organization; conceptual, logical and physical data modeling; meta data and data repository; steps in 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. Students will use industry-standard DBMs such as SQL/DS, Access and Oracle. Prerequisite: Completion of first year or permission from the instructor. Corequisite: COMP 3710.

**COMP 3930 Decision Systems —** Covers UNIX commands, utilities, scripts, C/C++ compilers and inter-process communication. Introduces object-oriented systems/programming techniques and visual analysis approaches to some standard management science problems (e.g. Computer simulation) using MS Visual C++.

**COMP 3940 Client/Server Computing I —** Provides an introduction to the client/server based systems. The course covers most of the analysis and design techniques used to implement a Client Server application. Topics include components of Client Server Architecture; client, server, and connectivity; key requirements and design goals; means to evaluate and achieve these requirements and goals; differences from traditional application environment; client and server delineation; structural and modeling issues; and, design methodologies for client/server based systems. Students will develop client/server based systems using X Windows, UNIX sockets, and RPC on UNIX.

**COMP 3950 Technical Prog with WIN 32 API —** Continues from where COMP 3710 left off and focuses on database technology. Topics include the importance of data in an organization; conceptual, logical, and physical data modeling; relational algebra; functional dependencies, and normal forms; meta data, and data repository; data integrity; steps in transforming user requirements to a database; database implementation; performance timing and optimisation; roles and responsibilities of data and database administrators in an organization. The course uses industry-standard DBMS such as SQL Server, Access and Oracle, Java multithreading, Java sockets, Java RMI, OrbixWeb, COM/DCOM, and ActiveX.

**COMP 3960 Multimedia Content —**

Addresses the understanding and creation of the different media elements found in multimedia titles. The three focal areas are: still pictures (images and digital drawings), sound (digital music and MIDI), and moving pictures (digital video and animation). Prerequisites: Completion of first year computer systems, Good command of English language (exam may be required).

**COMP 3961 Multimedia Communications —**

Addresses the communications skills needed for successful multimedia title development: drawing, scripting, graphic design, storytelling, and storyboarding. Prerequisites: Completion of first year computer systems, Good command of English language (exam may be required).

**COMP 3970 Applied Artificial Intelligence I —** Covers 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 Data Communications/Internetworking I —** Introduces LAN installation and administration using NOVELL Netware 4.1. Serial communications programming, using the Win32 API and TAPI. Design and implementation of Interrupt Service Routines. Implementation of bit and character-oriented protocols in the Windows 95/NT environment. Hardware/Software interface for communication programming. PPP implementation issues. Prerequisite: Completion of first year.

**COMP 4550 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 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 4570 Intranet Planning and Development —**

Explores alternative techniques for developing and deploying office Intranets. This course focuses on migrating business documents to an on-line format, using an office intranet. Lotus Notes is introduced as an intranet architecture, and compared to custom intranet solutions developed with HTML, CGI, ActiveX, and ActiveServer technologies. A term project includes implementation of a business website on an NT IIS server. Prerequisite: Completion of first year or permission from the program head.

**COMP 4575 Graphics Programming —**

Provides students with a foundation in interactive computer graphics and graphical user interfaces, placing special emphasis on the computer programming techniques involved. At the completion of the course, students will understand how a simple Computer Aided Design system is implemented. Prerequisite: CDCM 3470.

**COMP 4710 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 Topics in Operating Systems**

— Covers advanced topics related to the management of computer resources by an operating system (software) and supporting hardware. Topics include protection and security, data encryption and comparative analysis of current commercial operating systems.

**COMP 4900 Computer Projects**

**Practicum 2 —** See COMP 3900. Prerequisites: COMM 2214, COMP 2510, 2710, 2720.

**COMP 4911 Managing IS Development**

— Covers Software Engineering and Project Management skills and application to large scale business systems. Students work in large teams (15-20 people) to complete an extensive development project in Visual Basic and MS Access. Management and engineering strategies are introduced continually throughout the project, as students encounter the unpredictable effects of large team dynamics. This course includes a self-directed study component which allows student to bring diverse skills and areas of specialization to the project team. Prerequisite: COMP 3910.

**COMP 4915 Special Topics in MIS —**

Explores two operating systems that are used extensively within the IS community. In the first half of the course students learn to work within the UNIX environment. Shell programming, UNIX system administration, X Windows, and UNIX networking are introduced. The second half of the course covers support and administration of Windows NT Server core technologies. Students are prepared to a level suitable for Microsoft certification. Prerequisite: COMP 3510, COMP 3710.

**COMP 4921 Database Systems 2 —**

Focuses on database application development using some of the most popular database systems and application development tools in the industry. Topics include Recovery and Concurrency Control in multi-user distributed database systems; Object Oriented Database Systems; Logic Based Database Systems, client/server, and Object Oriented Database system development; and, performance considerations in database systems. Students will develop database applications using Oracle, E-SQL, PL/SQL, C, C++, Oracle's Designer/Developer 2000, and Gemstone Object Oriented Database System. Prerequisite: COMP 3920.

**COMP 4925 Advanced Topics in Database**

— Focuses on advanced topics in database, data management, system design tools, and related topics. Some of these topics include data warehousing; replication; databases on the Web; Object-Oriented Databases; Database performance; version control; transaction management; database applications based on three-tier model; connectivity; and, GUI development. This course will also introduce tools to build front end GUIs for desktop as well as internet based database applications such as Java AWT, Visual Basic, and PowerBuilder. Students will develop these applications and connect them to database servers such as Informix, Oracle, SQLServer, Access and Watcom using JDBC, ODBC, MS-Jet, and ActiveX. Prerequisite: COMP 3710.

**COMP 4931 GUI Programming**

**(MS Windows)** — Allows students to develop advanced decision support systems within MS Windows container applications using MS Visual C++. Covers dialogs, menus, standard/ActiveX controls, serialization, document/view model, automation using the Component Object Model (COM) and database access using the Open Database Connectivity (ODBC) standard.

**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 GUI Programming (Motif) —**

Introduces GUI programming for UNIX graphical workstations (Silicon Graphics Incorporated INDYs) using the ATandT C/C++ compiler. Covers event handling, window creation/destruction, dialogs, menus and resource management for the X Windows and Motif windowing systems.

**COMP 4937 GUI Programming (Internet)**

— Covers advanced Java programming techniques such as: threads, sockets, remote method invocation (RMI), abstract window toolkit (AWT), graphic Java toolkit (GJT), database access and computer graphics/animation.

**COMP 4941 Client/Server Computing 2**

— Continues from COMP 3940 and provides in-depth knowledge of the principles and practice of client/server or distributed systems design. The focus is on examining strategies and algorithms to achieve design goals such as performance, reliability, scalability, consistency, and security in a distributed system. Some of the topics that will be covered include Concurrency Control, Recovery and Performance considerations in multi-user and distributed data servers; Replication, Security and Fault Tolerance in distributed systems; and, Relational versus Object Oriented Database systems; design and development of client/server based database applications. Students will develop client/server based database applications using Oracle, SQLServer, E-SQL, PL/SQL, C, C++, Java and JDBC, VB, and ODBC. Prerequisite: COMP 3940.

**COMP 4945 Special Topics in Client/Server**

— Focuses on advanced topics in Client/Server Systems, Distributed Systems, and Network Computing. Topics reflect the state-of-the-art technology being used to develop such systems and also the current trends in this area. Some of these topics include Distributed Computing Environment; relational database management systems (RDBMS); Object Oriented Database Management Systems (OODBMS); Common Object Request Broker Architecture (CORBA); Distributed Operating Systems; Web Servers; Groupware; Workflow; Legacy Access; and, Mobile Agents. The emphasis is on developing/designing desktop-based, as well as internet-based, Client/Server Systems. The students will develop these applications using Java multithreading, Java sockets, Java RMI, Orbix Web, COM/DCOM and ActiveX. Prerequisite: COMP 3710.

**COMP 4951 Special Topics in Technical**

**Programming** — Covers OS/2 programming. Topics include the OS/2 Kernel (focusing on multi-tasking and inter-process communications); building client/server systems from the ground up; the OS/2 Presentation Manager (PM), and the Graphics Programming Interface (GPI). Previous experience with Windows programming as well as C++ programming is required. This course is only available for students who are enrolled in the Technical Programming option. Prerequisite: COMP 3950.

**COMP 4955 Technical Programming with MFC** — Covers Usual programming for GUI systems. Visual programming is a technique and not a language. This course focuses on trying to keep the writing of code to a minimum and how code generators will ease our jobs. The focus will be on Microsoft Visual C++ , IBM Visual Age will be examined only for purposes of comparison. The limitations of visual programming and how to handle them will also be discussed. This course is available to students enrolled in the Technical Programming or Combined Program options. Prerequisite: Completion of first year.

**COMP 4961 Internetworking with Java** — Addresses the delivery, and administration of delivery systems, for multimedia content for the World Wide Web (WWW). Topics include host system configuration, dynamic database publishing, server set up and administration, and server-side programming. Prerequisites: COMP3710, COMP 3960, COMP 3900

**COMP 4962 Instructional Design for Multimedia** — Addresses the principles and techniques used to build a sound plan for a multimedia computer-based training (CBT) title. The focal areas are the course plan, task analysis, instructional strategy selection, instruction resources selection, and the course or learner evaluation.

**COMP 4963 Component and Media Frameworks** — Addresses the building of multimedia software components for cross-platform delivery. Topics include the Java Beans component technology, and the Java Media Framework and associated APIs.

**COMP 4965 Computer Animation Fundamentals** — Covers the principles and techniques used to produce digital animation clips for a multimedia title. The focal areas are classical animation, 2-D and 3-D animation, modeling, rendering, and lighting.

**COMP 4966 Multimedia Development** — Addresses the project management and administration skills needed for successful multimedia title development. The three focal areas are project management, asset management, and quality control.

**COMP 4967 Multimedia Paradigms** — Covers the new media industry as a whole, and the user interface concepts and principles that drive successful multimedia titles. The three focal areas are the new media industry and media law; visualization and user interface design; and the game and virtual reality paradigms.

**COMP 4969 Multimedia Practicum** — Provides the students with an opportunity to apply all of their specialized Multimedia Software Development background towards a comprehensive project in a real-life setting. Working in small teams, the students will design and implement a commercial-grade multimedia title. The projects are industry-sponsored, and will typically involve a computer-based training title.

**COMP 4971 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 practise and demonstrate these in their COMP 4900 project course. Prerequisite: COMP 3970.

**COMP 4975 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/Internetworking 2** — Covers advanced topics in Data Communications such as advanced UNIX systems programming for telecommunications; developing TCP/IP and UDP/IP applications for the Internet and Intranet using the Berkeley socket interface. Students develop Client/Server models on the UNIX environment using IPC, RPC and TCP/IP protocol suite. This course also deals with design and implementation of Multimedia communications applications on UNIX platform and provides coverage of special topics such as building a UNIX internet server, as well as security and firewall issues. Prerequisite: COMP 3720, COMP 3980. Coverage of special topics such as building a UNIX Internet server, as well as security and firewall issues. Prerequisite: COMP 3720, COMP 3980.

**COMP 4985 Topics in Data Comm/Internetworking** — Covers advanced Windows 95/NT systems programming for communications. Developing TCP/IP and UDP/IP applications for the Internet and Intranet using the Windows Socket API (Winsock) interface. Java programming for Web site development and Java applets for Netcentric computing. Multimedia communications using TCP and UDP. Implementation of error detection/correction algorithms. Prerequisite: COMP 3720.

**COMP 7005 Data Communication Principles** — Covers topics beyond those covered in COMP 3605. Applies theoretical material to the design and development of communication applications. Presents a broad range of topics needed to apply the principles of data communications. The student acquires a thorough understanding of communications hardware and its interface to communications software. Prerequisites: COMP 2605 and admission to the Bachelor of Technology Program or permission of instructor and program head.

**COMP 7011 Computer Graphic Fundamentals** — Provides the student with a foundation in interactive graphics and graphical user interfaces, emphasizing the computer programming techniques involved. Introduces computer graphics systems, graphical user interfaces, devices and graphics software/hardware, followed by output primitives and their attributes and a preview of 3D surface representation using polygon meshes. Presents 2D/3D transformations, windowing, clipping and 3D viewing. Explores the concept of a graphical object within an object hierarchy and how this idea can be extended to form the basis of an interactive computer graphics package, comparing it to some commercial version of PHIGS (Programmer's Hierarchical Interactive Graphics System). Prerequisites: COMP 3475 and admission to the Bachelor of Technology program or permission of program head.

**COMP 7036 Applied Research Methods in Software Development** — Introduces principles and procedures of standard research methodologies in the context of software development and includes the relationship between software development and fields such as MIS, computing science, systems analysis and design, data processing, knowledge engineering, and decision theory; theories, paradigms and frameworks in software development; the role and importance of models, theories and conceptual frameworks (prescriptive and descriptive models; scientific tradition; inference; deductive, inductive and abductive reasoning); traditional empirical research methods: survey, experiment, case study and implementation (generate and test); measurement and evaluation, reliability, validity, literature exploration and criticism. Prerequisites: Admission to the Bachelor of Technology program or permission of the program head.

**COMP 7057 Neural Network Applications** — Explores neurobiological antecedents and motivations for connectionist models. Reviews various models of this technology and investigates its unfamiliar vocabulary. Focuses strongly on building and training working programs that deal with practical applications using both student-written and commercially-available programs. Notes the importance of various heuristic network training techniques in comparison to programming and records these heuristics in a course application Log. Prerequisite: Permission of instructor and program head.

**COMP 7071 Database Design** — Focuses on two major aspects of database design: Logical data modeling and Relational database design and optimization. Prerequisites: COMP 3710 and admission to the Bachelor of Technology program or permission of instructor and program head.

**COMP 7081 Technical Issues in Software Development** — Presents an overview of technical issues in software development. Addresses major activities and techniques in developing software and the resulting documentation and outputs produced. Presents only selected approaches with emphasis on overall understanding of software development. Uses a case study throughout the course to aid in concepts understanding. Prerequisites: Admission to the Bachelor of Technology program or permission of the program head.

**COMP 7401 Advanced Topics in Programming Methodology** — Advanced topics in programming methodology include new trends in software development, net-centric computing, object-oriented frameworks, advanced programming languages, logic, and many more. Specific topics for this course will vary from term to term due to the rapid change and development in the software industry. Students will be exposed to the latest advances in software engineering through lecture, conference attendance, seminars, projects, classroom discussion and/or labs. This course will focus on Java and the shift to net-centric computing. Prerequisite: COMP 7081.

**COMP 7615 Selected Topics in Computer Systems** — Focuses on selected topics in computer systems. The purpose is to introduce special topics in one specific area in computer systems. Specific topics will vary from term to term. The topics selected will be those considered most appropriate for industry and the students in the degree program. Future topics may include multimedia, artificial intelligence, numerical analysis. Prerequisite: COMP 7081.

**COMP 7881 Advanced Topics in Software Engineering** — Advanced topics in software engineering deal with issues related to developing quality, cost-effective, often complex software. Some of these are software re-use, software testing, quality assurance, configuration management, CASE tools, software interoperation, reverse engineering, etc. Specific topics for this course vary from term to term due to the rapid change and development in the software industry. Students will be exposed to the latest advances in software engineering through lecture, conference attendance, seminars, projects, classroom discussions and/or labs. This course will focus on software quality assurance. Prerequisite: COMP 7081.

**COMP 8005 Data Communications Applications** — Encompasses Communication protocols, reference models and case studies of transmission protocols. Examines higher layers in the OSI reference model. Includes Internetworks: naming issues, multicast/broadcast in the internetwork; local networks: multiple-access and ring architectures; Implementation aspects: modularity and efficiency in the implementation of protocols, case studies. Introduces client-server models. Prerequisites: COMP 7005 or permission of instructor and program head.

**COMP 8011 Computer Graphics Applications** — Focuses on Photorealism, the latest development in Computer Graphics, with emphasis on shading, lighting, rendering, and illumination placing special consideration of the computer programming requirements. Begins with Graphical User Interface (GUI) design and Computer Graphics (CG) interaction, followed by curve and surface representation, with emphasis on polygon meshes and usage in graphics packages, physics of color and some common color models. Examines visible surface determination and illumination/shading models, then some advanced raster and geometric modeling algorithms, using student expertise developed in course projects. Tests many of the concepts using the C/C++ computer programming language on Silicon Graphics INDY/INDIGO (SGI) workstations. Develops a small interactive, full-color-shaded-lighted, 3D computer graphics package and special projects within the student's area of interest. Prerequisites: COMP 7011 or permission of instructor and program head.

**COMP 8045 Practicum I** — Provides for practical application of computing knowledge and skills preferably in a workplace setting and with projects that involve applied research or technology transfer. Should produce a product that is innovative, experimental or exploratory in nature. Ranges from directed study projects to the preparation of proposal or project plan and includes the development of formal deliverables, including a final report. COMP 8045 and COMP 8046 can be taken as a single course or separately to meet the requirement of the Bachelor of Technology degree. Prerequisite: completion of all 7000 and 8000 level Bachelor of Technology courses, with the exception of the 1st 8000-level specialization course, which can be taken concurrently, and permission of the program head.

**COMP 8046 Practicum 2** — Provides for practical application of computing knowledge and skills preferably in a workplace setting and with projects that involve applied research or technology transfer. Should produce a product that is innovative, experimental or exploratory in nature. Ranges from directed study projects to the preparation of proposal or project plan and includes the development of formal deliverables, including a final report. Prerequisite: COMP 8045 and permission of program head.

**COMP 8057 Applied Artificial Intelligence Applications** — Explores in depth some AI-related techniques and concepts from professional and academic literature — including some material which has not entered the industry mainstream. Includes cellular automata; chaos theory; expert systems (knowledge-based systems); fuzzy logic; genetic algorithms; machine learning; machine vision; natural language processing, and virtual reality. Varies in course content and pacing to meet the needs of the student and to review current development. Prerequisites: COMP 3970 or COMP 3485, or permission of instructor and program head.

**COMP 8071 Advanced Database Modeling** — Critically analyzes the structural and integrity aspects of the relational model, the significance of views and their applicability to application-data independence, different strategies of handling missing information in database systems, and various data distribution strategies, by applying criteria for efficient distribution of data. Prerequisites: COMP 7071, or permission of instructor and program head.

**COMP 8081 Management Issues in Software Engineering** — Presents current topics important to managing software development projects. Concentrates on understanding and being able to apply state-of-the-art management techniques to improve software productivity, and help software projects and companies transition to new technologies. Emphasizes management issues such as project leadership, communication, critical thinking and problem-solving skills. Prerequisites: COMP 7081 and admission to the Bachelor of Technology program or permission of instructor and program head.

**COMP 8505 Selected Topics in Data Communications** — Conducts an in-depth study of specific and highly specialized areas in Data Communications. Develops a substantial project in the selected area, and produces an application or project report or both upon completion. Prerequisites: COMP 8005 (or 7651) or permission of instructor and program head.

**COMP 8511 Selected Topics in Computer Graphics** — Discloses some of the latest developments in Computer Graphics, with emphasis on computer programming techniques involved. Reviews object hierarchy, CG interaction, GUIs and interfaces. Presents curve and surface representation, with emphasis on polygon meshes and handling them in graphics packages. Examines the physics of color and some of the more common color models as well as visible surface determination and illumination/shading models, a major topic in the course. Explores advanced raster and geometric modeling algorithms using student expertise developed in special course projects, and some of the common methods of computer animation. Tests many of these concepts using C or C++ computer programming languages on Silicon Graphics INDY/INDIGO graphics work stations. Develops a small interactive, full-color-shaded-lighted, 3D computer graphics package and special projects in the students' areas of interest. Prerequisites: COMP 8011 (or 7840) or permission of instructor and program head.

**COMP 8557 Selected Topics in Applied Artificial Intelligence** — Emphasizes creating applications using techniques from COMP 8057. Varies in detailed contents and pacing of the course material from year to year, according to interests and needs of the students, and according to developments in the field. Prerequisites: COMP 8057 (or 7495) or permission of instructor and program head.

**COMP 8571 Selected Topics in Database** — Focuses on emerging object-oriented database technology. Discusses object-oriented design and development with specific emphasis on database systems. Includes topics on data administration, data dictionary systems, and data access standards for client/server and distributed database systems. Prerequisites: COMP 8071 (or 7660) or permission of instructor and program head.

## DIAGNOSTIC MEDICAL SONOGRAPHY

**DSO 5103 Obstetrical/Gynecological Sonography I** — Covers 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.

**DSO 5112 Abdominal Sonography I** — Covers the theory necessary to identify normal abdominal anatomy as seen with ultrasound. Pathology of the liver and biliary tract, imaging techniques and correlation of patient history with sonographic appearances are included.

**DSO 5113 Obstetrical/Gynecological Sonography I** — Covers the theory and skills necessary to identify normal anatomy of the gravid and non-gravid pelvis. Gynecological and 1st trimester pathology, imaging techniques and correlation of patient history with sonographic appearances are included.

**DSO 5116 Clinical Experience in Sonography I** — Provides hands-on sonographic experience at clinical sites. The emphasis of this course is abdominal and pelvic imaging. Obstetrical imaging is included as per site workloads. Students are expected to perform patient care services as required of health care technologists.

**DSO 6103 Obstetrical/Gynecological Sonography 2** — Continues from DSO 5103, with a greater emphasis on clinical skills and applications. Students may be required to successfully undergo, and clear, a criminal record search prior to clinical.

**DSO 6104 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. Students may be required to successfully undergo, and clear, a criminal record search prior to clinical.

**DSO 6112 Abdominal Sonography 2** — Continues from DSO 5112. The focus is on pathology of the abdomen, including thyroid, breast, scrotum and prostate. Correlation of patient history with sonographic appearances is emphasized. Prerequisite: DSO 5112.

**DSO 6113 Obstetrical/Gynecological Sonography 2** — Continues from DSO 5113. The focus is on abnormal fetal development and maternal disease states that affect pregnancy. Correlation of patient history with sonographic appearances is emphasized. Prerequisite: DSO 5113.

**DSO 6114 Vascular Sonography** — Covers the theory necessary to describe blood flow hemodynamics, and identify carotid artery and leg vein anatomy and flow abnormalities. Imaging techniques, and correlation of patient history and sonographic appearances are included. Doppler instrumentation is emphasized.

**DSO 6115 Echocardiography** — Introduces students to cardiac anatomy and physiology as seen by ultrasound.

**DSO 6116 Clinical Experience in Sonography 2** — Provides hands-on sonographic experience at clinical sites. By the end of the course, they are expected to be able to perform sonographic examinations in the abdomen (including small parts), obstetrics and gynecology independently. They are expected to be able to perform Doppler examinations of the carotid arteries and leg veins with assistance. Clinical observations are arranged in pediatrics and echocardiography. Students are expected to perform patient care services as required of health care technologists.

## ECONOMICS

**ECON 1150 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.

**ECON 2000 Managerial Economics** — Focuses on the issues of resource allocation within a business. It will examine how managers can utilize the tools of economics, accounting/finance and decision theory to aid in these critical decisions. The course will consider how differences and changes in the internal operating conditions and in the external political-economic environment can affect a manager's resource allocation decisions. Topics include incremental analysis, short and long run decision-making and basic financial analysis.

**ECON 2100 Microeconomics** — Covers the product and resource markets. Students analyse 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 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.

**ECON 5200 Intermediate Macroeconomic Analysis** — *Under development.*

**ECON 6500 Managerial Economics** — *Under development.*

## ENVIRONMENTAL ENGINEERING

### EENG 7700 Environmental Case Studies

— Provides an introduction to the major areas of study in the Environmental Engineering program. Case studies will be presented by senior professionals currently active in the environmental engineering field. Topics covered: industrial and municipal liquid waste management; solid waste management; contaminated site investigation and management; environmental law; principles of environmental risk assessment and environmental impact assessments; ground water flow and contaminant transport. Prerequisite: Diploma of Technology in Engineering or Science or departmental approval.

### EENG 7710 General and Physical Chemistry I

— Begins a two-course series. The major topics covered are the structure of atoms, compounds, stoichiometry, oxidation and reduction, and electrochemistry. Prerequisite: EENG 7700 or departmental approval.

### EENG 7711 General and Physical Chemistry 2

— Builds on earlier material and will include solutions, acids and bases, salt and buffer solutions and solubility of compounds. Some applications of precipitation reactions to water and wastewater treatment will also be examined. Prerequisite: EENG 7710.

### EENG 7712 Organic Chemistry

— Introduces the student to organic chemistry. The nomenclature, physical properties, and reactivities of the more common classes of organic compounds are discussed with special attention given to industrial chemicals and organics that are environmental hazards. Prerequisite: EENG 7711.

### EENG 7713 Environmental Analytical Chemistry

— Provides an overview of the environmental laboratory discipline. Topics will include test parameter selection and sample collection concerns; analysis procedures, quality assurance and data management. It is important for engineering personnel to have a technical appreciation for how such labs operate. Interpretation of results obtained from analytical laboratories is an integral part of waste management or environmental assessment. Prerequisite: EENG 7712.

### EENG 7714 Methods of Wastewater Analysis

— Introduces the student to some of the analytical methods used to determine common pollutants in water and wastewater. The theoretical aspects of each analysis as well as typical industrial pollution problems related to local industry are discussed during the lecture periods. Students practise the use of laboratory equipment in accordance with proper procedures in the laboratory periods. Prerequisite: EENG 7712.

### EENG 7715 Hydraulics I for EET

— Introduces hydraulics (including hydrostatics, fundamental flow and volume relationships) and solving simple, steady, pipe flow problems. Prerequisite: EENG 7700 or with departmental approval.

### EENG 7716 Soil Mechanics and Groundwater for EET

— Introduces soil mechanics and groundwater, including soil origins, types and classifications, phase relationships, compaction, Darcy's law, flow nets, settling pond analysis, soil pressure and soil strength. Prerequisite: EENG 7715.

### EENG 7717 Hydrology for EET

— Introduces hydrology, including precipitation, drainage basins, rational formula, SCS method, frequency analysis of extreme flows, regional analysis, low flow analysis and measurement of hydrologic parameters. Prerequisite: EENG 7716.

### EENG 7718 Hydraulics 2 for EET

— Continues from Hydraulics I for EET, including pipe networks, pumps, uniform and non-uniform open channel flow, and flow measurement. Prerequisite: EENG 7717.

**EENG 7719 Survey Techniques for EET —**

Introduces fundamental concepts of surveying with applications for applied waste management. Topics include an introduction to the survey methodology, survey instrumentation, a description of the theory associated with survey computations, methods for determining horizontal positions and elevations, including position determination using GPS satellite technology. Prerequisite: EENG 7700 or with departmental approval.

**EENG 7720 Applied Microbiology —**

Presents the types and functions of microorganisms and provide examples as to where microbiology is used within the engineering field to reduce the environmental impacts of industrial processes and for the protection of human health. Topics covered are basic characteristics of bacteria, nutrient cycles, oxidation and reduction, waste treatment, pollution and bioremediation. Case studies of applied microbiological projects will be reviewed including constructed wetlands, drinking-water distribution systems and pollution monitoring. Prerequisites: EENG 7710, 7711, and 7712 or departmental approval.

**EENG 7721 Applied Toxicology —**

Provides an introduction to the principles of toxicology, as applied to environmental engineering. Course topics include a review of biological, organic and inorganic substances and their properties and behavior in the environment; the biological responses of cells and animals to toxic substances; and the application of toxicology to risk assessment and the development of water-quality guidelines. Prerequisite: EENG 7720.

**EENG 7740 Physical Hydrogeology —**

Begins a three-course series in the Groundwater technical studies. It gives students an overview of the occurrence and movement of groundwater in a variety of geologic settings and explains the effect of human activity on that movement. Topics include types of aquifers, properties of porous media, groundwater flow and pump testing of aquifers. The course provides theoretical foundation for the study of groundwater contaminants in EENG 7741 — Contaminant Hydrogeology. Prerequisite: Civil and Structural Diploma or B.Sc. in Civil Engineering or completion of EENG 7718.

**EENG 7741 Contaminant Hydrogeology**

— Continues with the second of a three-course series in the Groundwater technical studies. A continuation of EENG 7740, it examines the major sources of groundwater contaminants and their flow in groundwater, and presents the processes by which contaminants are transported through the subsurface as free-phase products or dissolved aqueous constituents. Topics will include terminology, water quality, chemical constituents of groundwater, natural chemical evolution of groundwater, instrumentation, transport in fractures rock LNAPL's and DNAPL's and transport mechanisms, measurement of parameters, sources of contamination, and an introduction to solutions employing analytical and numerical methods. Prerequisite: EENG 7740.

**EENG 7742 Groundwater Modeling:**

**Numerical Methods** — Concludes the third of a three-course series in the Groundwater technical studies. It introduces students to the basics of two major modeling tools used in industry: finite difference and finite element. The course explores mathematical basis of the two methods and allows students to experiment with simple models of each type, using computers. Prerequisite: EENG 7741 (may be taken concurrently).

**EENG 8750 Municipal Wastewater**

**Treatment 1** — Begins a series of two courses dealing with the treatment of municipal wastewater. It examines the sources of municipal wastewater, factors that affect wastewater flow, the measurement of wastewater flow and wastewater strength, the effects of wastewater discharges on the receiving environment, and the principles of preliminary and primary treatment of municipal wastewater. Prerequisites: EENG 7714 and 7721.

**EENG 8751 Municipal Wastewater**

**Treatment 2** — Examines the use of suspended growth and fixed-film biological unit processes in the secondary treatment of municipal wastewater. Additional topics include advanced wastewater treatment, nutrient removal, disinfection, secondary clarification and residuals management. Prerequisite: EENG 8750.

**EENG 8752 Industrial Wastewater**

**Treatment 1** — Begins a three-course series addressing industrial liquid waste management. Course topics include the nature of industrial waste; the associated environmental significance; and identification of major pollutants. Prerequisites: EENG 7714, 7721 and 8751.

**EENG 8753 Industrial Wastewater**

**Treatment 2** — Covers the classification and application of treatment methods and detailed discussion of equalization, neutralization, oil and grease separation, nutrient removal by chemical and biological methods, and separation of liquids and solids. The discussion will encompass treatment principles, design criteria and practical considerations. Prerequisite: EENG 8752.

**EENG 8754 Industrial Wastewater**

**Treatment 3** — Continues from EENG 8753, covering additional treatment methods for industrial liquid wastes. The unit processes discussed are primarily physical-chemical processes including chemical coagulation and precipitation, absorption, ion exchange, membrane separation, chemical oxidation and gas transfer. Concludes with a discussion on residual management. Prerequisite: EENG 8753.

**EENG 8755 Drinking Water Treatment —**  
*Under development.*

**EENG 8760 Solid Waste Management —**

Begins a four-course series in the solid-waste technical studies, Solid Waste Management gives an overview of municipal solid-waste management including collection, transfer, transport and disposal. Methods of processing, introduction to disposal facilities, disposal options, and the economic and environmental issues of solid-waste management are covered in this course. Students will be prepared to advance into the next three courses in the solid-waste technical studies. Prerequisites: EENG 7700, 7720 and 7721.

**EENG 8761 Recycling and Reduction**

**Techniques** — Designed as the second of a four-course series in the solid-waste technical studies. Topics include basis and impact of the 3 R's on the waste management systems; industry examples; recycling and recovery of paper, cardboard, metals, plastic, oil, glass, and other commodities; new uses of recycling and recovery; composing basics; types of systems; design of plants; and markets. Prerequisite: EENG 8760.



**EENG 8762 Landfill Design and Operation** — Designed as the third course of the four-course technical series on the subject of solid waste. This course will examine landfill site selection, landfill capacity analysis, landfill construction and operations, environment systems overview of leachate generation and landfill gas. Prerequisites: EENG 7741 and 8761.

**EENG 8763 Environmental Controls for Landfills** — Concludes the four-course technical series on the subject of solid waste. It will examine state-of-the-art environmental control systems that are being used in B.C. and in the U.S. to meet new government regulations. The course will include environmental issues, leachate composition, predicting leachate qualities within the EPA HELP model, landfill closure, leachate containment, leachate treatment, landfill gas collection and environmental monitoring. Prerequisite: EENG 8762.

**EENG 8764 Advanced Residuals Management 1** — Begins a four-course series in the residual management technical studies. It introduces students to the management of non-municipal solid wastes including biomedical, industrial, hazardous and special wastes. Investigation, identification and classification, storage, treatment, and disposal of wastes will be presented as an overview on the subject of residual management. Applicable regulations such as Canadian EPA, Transportation and Dangerous Goods Act, BC Waste Management Act will be discussed in this course. Prerequisite: EENG 8760.

**EENG 8765 Advanced Residuals Management 2** — Designed as the second of a four-course series in the residuals management technical studies. The course highlights the operational approaches to minimizing waste with particular emphasis on the principal process and practice of waste reduction assessment. Sampling and analytical methods for determining hazardous waste will be covered in this course. Prerequisite: EENG 8764.

**EENG 8766 Advanced Residuals Treatment 1** — Describes major treatment technologies and methods which historically and traditionally applied to hazardous waste. The course will cover thermal, chemical, biological and physical treatments. Prerequisite: EENG 8765.

**EENG 8767 Advanced Residuals Treatment 2** — Follows the successful completion of Advanced Residuals Treatment 1, and familiarization with various treatment technologies of hazardous waste, this course will describe the specific treatment methods and procedures commonly used today. There will be particular emphasis on incineration, solidification and detoxification. Prerequisite: EENG 8766.

**EENG 8768 Advanced Residuals Management** — *Under development.*

**EENG 8769 Advanced Residuals Treatment** — *Under development.*

**EENG 8770 Environmental Site Assessment** — Begins a five-course series in the contaminated sites technical studies. It has two primary purposes. First, it summarizes the five main processes in the management of contaminated sites: site audit, site investigation, risk assessment, sampling, and treatment and monitoring. Second, it gives students the necessary knowledge and skills to perform a site audit. The course focuses on the B.C. regulatory context with particular emphasis on "due diligence" requirements and on current practices in environmental site assessments (ESA's) and environmental audits (EA's). Case histories will be used as examples to demonstrate the principles of ESA's and EA's. Prerequisite: EENG 7700 or departmental approval.

**EENG 8771 Contaminated Site Investigation Process** — Designed as the second of a five-course series in the contaminated sites technical studies, this course introduces students to the second major process in contaminated site management: site investigation. It highlights the importance of site characterization in terms of soil, water and sediment, as an essential and integral part of the overall management of contaminated sites. It also focuses on the role of the site investigator, and on a phased planning approach to obtaining proper data to characterize site contamination, evaluate remedial alternatives and assess risks. Students are shown how to use their professional judgement in applying the scientific (and iterative) process of formulating a hypothesis, or conceptual model, which is subsequently tested and revised as necessary based on sampling results. Prerequisites: EENG 7741 and 8770.

**EENG 8772 Site Remediation and Risk Assessment Process** — Designed as the third of a five-course series in the contaminated sites technical studies. It introduces students to the third major process in contaminated site management: site remediation and risk assessment. Focusing on the role of the site investigator, the course promotes a scientific approach for evaluating and selecting options to manage site contamination including treatment, removal or containment. Building on the site investigation data from EENG 8771 - Contaminated Site Investigation Process, this course focuses specifically on toxicological principles of risk assessment, and on the evaluation and design processes for site remediation. It also lays the foundation for applying these processes in EENG 8774 - Site Remediation Technologies. Prerequisite: EENG 8771.

**EENG 8773 Sampling Methods for Contaminated Sites** — Designed as the fourth of a five-course series in the contaminated sites technical studies. This field school involves two full days of hands-on sampling exercises giving students an opportunity to apply the knowledge and skills from EENG 8771 - Contaminated Site Investigation Process: sampling strategies, design and implementation of sampling plans, and interpretation of results. The sampling exercises include: (1) soil sampling using drill rig, backhoe and hand augers; (2) groundwater sampling by installation, development and testing of monitoring wells; (3) overview of surface water and sediment sampling techniques; and (4) demonstration of geophysical investigation techniques. The focus of the course is on the role of the site investigator/remedial designer in the contaminated-site management process. Prerequisite: EENG 8772.

**EENG 8774 Site Remediation Technologies** — Concludes a five-course series in the contaminated sites technical studies. It focuses specifically on the range of remedial technologies that are available and provides students with the skills to apply appropriate technologies in given situations. Discussion on the techniques to monitor and evaluate performance of the selected remedial options are also included. Since this is the final course in the series, this course also focuses on integrating the material from the first four courses. Prerequisite: EENG 8773.

**EENG 8780 Environmental Law 1** — Many industries manufacture, transport, treat, purchase and then use hazardous substances. If these substances escape into the soil, water or air then they may be held responsible for any damage or injury that this may cause. This course will review and discuss a wide range of legislation and its impact on the liability and the potential for prosecution. Prerequisites: EENG 7700.

**EENG 8781 Risk Assessment** — Examines risk-assessment methods and outcomes including definitions and discussions of the principles of hazard identifications, dose response, exposure assessment and risk characterization. Specific risk-assessment techniques will be presented including checklists, preliminary hazard analysis, what-if analysis, fault-tree analysis, event-tree analysis, hazard and operability studies. Study EPA risk assessment procedures and their application and limitations. Prerequisites: EENG 8780.

**EENG 8782 Value Analysis and Environmental Management** — Provides an overview of the context, process, framework, methods and case studies for valuing and managing environmental aspects of projects on a global, regional and local scale. The course will provide the student with: the knowledge and tools needed to apply cost benefit analysis method for appraisal of environmental projects including putting value on environmental effects. The student will also learn to apply the guiding principles of sustainability; and consider the laws, policies and regulations related to environmental management. Other topics that will be discussed include Environmental Management Systems (EMS), life-cycle analysis; environmental risks and liabilities. Prerequisite: EENG 8781.

**EENG 8783 Risk Management** — Covers factors affecting management decisions: regulatory requirements, corporate standards, employee politics, public and media, and financial limitations. The importance of risk communication, including communication factors influencing successful and unsuccessful projects will be assessed. Other risk management options including prevention planning, emergency response, containment, on-site treatment, off-site treatment, landfill and other storage means will be examined from the above perspectives. Prerequisite: EENG 8781.

**EENG 8784 Environmental Law 2** — Builds upon the students' understanding of the constitutional context of the Canadian legal system and environmental law. It addresses environmental regulation of various natural resources sectors in British Columbia, including forestry, mining, energy and fishing. The course also covers law regulating environmental impact assessment and environmental aspects of municipal and regional land use planning processes. In addition to discussing the role of aboriginal rights in environmental and natural resources management, the course examines current aboriginal land claims and treaty negotiations in British Columbia and their potential impact on natural resource development. Prerequisite: EENG 8780.

**EENG 8785 Decision-making in Environmental Management** — Examines the decision-making and decision-planning models as they relate to environmental management. Models used in both the private and public sector will be considered, and students will have an opportunity to apply these models in assignments, role playing exercises, and workshops. The course will give students a thorough grounding in the relationship between business planning, strategic planning, and environmental management; rational decision-making processes; the institutional structures and methods of decision-making in environmental management; and the relationship between current decision-making models and sustainable development. Basic management skills which also impinge on environmental management (project management, proposal and report preparation, budget management) will also be discussed. It is recommended that individuals registering for this course have a working knowledge of environmental legislation and management practices.

**EENG 8790 Air Quality Management** — Provides an overview of air pollution, focusing on atmospheric air quality issues. The course will discuss the sources of air pollution and their regulation. The student will be introduced to emission inventories, urban air pollution, and meteorology. An introduction to dispersion modeling as a method of linking emissions to air quality will also be presented. An outline of the causes and effects of global warming, including a Canadian perspective will be presented. Prerequisite: EENG 7712.

**EENG 8791 Industrial Air Pollution Control Techniques** — Provides an overview of the different methods used to control the release of air pollutants from industrial and mobile (vehicular) sources. The different types of contaminants, their causes, and the regulations governing their release are discussed. The basic design principles of the various technologies and their application form the bulk of the course. A basic treatment of combustion and fluid dynamics is also covered to aid in understanding equipment, design and selection. Prerequisite: EENG 8790.

**EENG 8792 Air Quality Monitoring and Testing** — Covers the theory and practice of emission testing for particulates including gas flow measurements, isokinetic sampling, determination of gas molecular weight, moisture determination methods, sampling train components, equipment calibration, details of a complete testing program, calculation details, report writing and regulatory requirements. Prerequisite: EENG 8791.

**EENG 8801 Terrain Map/Erosion Processes** — Covers the procedures involved in the creation of terrain and interpretative maps, with emphasis on utilisation Topics will include: delineation of polygons (air photo interpretation and ground truthing); mapping conventions and development of polygon labels (ELUC, 1988, 1997); determination of mass wasting; and erosion and sediment delivery hazards. The various categories of mass wasting (slides) will be defined and discussed along with specific examples (case histories). Causes, effects, and mitigative measures will be examined for each specific example. Surface erosion and sedimentation processes will also be covered. A study assignment will be given on hazard assessment. A field trip will be arranged when and if suitable sites are available. If a field trip is not possible the classroom component will be expanded to three days. The actual time involved for a field trip will include travel and could be as much as ten hours.

**EENG 8802 Forest Road Design and Construction** — Covers the applicable sections of the Forest Practices Code Act, Forest Road Regulation. Engineering Guidelines will be discussed. Other topics will include preliminary road location surveys and terrain stability assessments with emphasis on minimization of environmental risks. Various construction techniques will be present along with the basic elements of drainage design. Case histories will be presented and a study assignment will be given. Students will be asked to make their own judgements on optimum road location, design, and construction in specific instances. A field trip will be arranged when and if suitable sites are available. If a field trip is not possible the classroom component will be expanded to three days. The actual time involved for a field trip will include travel and could be as much as ten hours.

**EENG 8803 Forest Road Rehabilitation** — Covers the applicable sections of the Forest Practices Code Act, Forest Road Regulation. Road maintenance and upgrade during harvesting operations will be discussed, as well as deactivation after harvesting operations and silvicultural commitments have expired. Topics will include: field assessment procedures, mapping, and the development of appropriate prescriptions. Case histories will be presented and a study assignment will be given. Students will be asked to develop appropriate prescriptions for upgrade or deactivation in specific instances. A field trip will be arranged when and if suitable sites are available. If a field trip is not possible the classroom component will be expanded to three days. The actual time involved for a field trip will include travel and could be as much as ten hours.

**EENG 8804 Hydrological Mapping and Hydrometrics** — Covers the principles of hydrology, mapping of hydrological features, measurement of streamflow, water quality, precipitation and soil water equivalent, and the types of analytical procedures that can be performed on such data.

**EENG 8805 Stream Channel Assessment** — Covers the applicable sections of the Forest Practices Code Act with particular emphasis on Interior and Coastal Watershed Assessment Procedures. The collection and interpretation of data down a stream channel will be outlined. Other topics will include USDA Forest Service methodology, Ministry of Environment Channel Assessment Procedures and mapping methodology. The effects of timber harvesting on stream channel morphology will also be discussed, along with channel restoration strategies. A study assignment will be given, involving computer input of a data set into the Watershed Assessment Procedure spreadsheet. A field trip will be arranged when and if suitable sites are available. If a field trip is not possible the classroom component will be expanded to three days. The actual time involved for a field trip will include travel and could be as much as ten hours.

**EENG 8810 Pulp and Paper Industry for EET** — Covers details of the Kraft process, chemistry of the process, process parameters and environmental emissions. Other pulp and paper processes are also reviewed. The principal emissions (air, water, solids) are discussed in detail in terms of formation, chemistry, analytical detection techniques and engineering control methods. Potential process modification in the pulp and paper industry as a mean of decreasing environmental emissions are also discussed. Prerequisite: EENG 7700 + 2 yr Science Diploma.

**EENG 8811 Mining and Extractive Metallurgy Industry** — Covers a review of extractive metallurgy processes and associated pollution control practice. Current pollution abatement practices in the mining industry and mine reclamation practices are also included. The course covers modern technologies for control of sulfur dioxide, particulates, nitrogen oxides and others. In addition, control techniques for liquid wastes, acid mine drainage, and solid wastes are also included. Prerequisite: 2 yr Science Diploma or equivalent.

**EENG 8812 Petroleum Industry** — Covers environmental control practices in the Natural Gas and Petroleum industry. It includes a variety of topics in air and water pollution abatement practices. Some aspects of solid waste treatment are also discussed. Prerequisite: 2 yr Science Diploma or equivalent.

**EENG 8820 Separation and Identification Techniques** — There is an increasing need to monitor and assess the presence of potentially toxic products in the environment. These products can vary from agricultural products which can include organo-chloride pesticides, or industrial by-products such as petroleum hydrocarbons and polycyclic aromatic hydrocarbons to a variety of trace metals. It is the purpose of this course to show how to develop methods for the separation, identification and quantification of agricultural and environmental compounds in air, water, soil and sediment samples. Prerequisite: 2 yr Science Diploma or equivalent.

**EENG 8822 Analytical Atomic Spectroscopy I** — Covers the basic theory and practice of analytical atomic spectroscopy, with emphasis on inductively coupled plasma optical emission spectroscopy. Major topics include: atomic spectra-emission, absorption, fluorescence; diffraction-grating spectrographs; single and multichannel detectors; RF induced plasmas; calibration standards; spectral interferences and matrix effects; quality assurance and data handling. Laboratory exercises include: analytical line selection, spectral interference corrections, matrix effects, detection limits and dynamic range, plasma operating conditions. Prerequisite: 2 yr Sciences Diploma or equivalent.

**EENG 8823 Analytical Atomic Spectroscopy 2** — Continues from Analytical Atomic Spectroscopy I. Major topics include: optimization of plasma operating conditions, other emission sources DCP, FAPES, flow discharge, arc, spark; sample induction pneumatic and ultrasonic nebulizers; ICP-MS mass selectors; separation and preconcentration strategies; sample preparation. Laboratory exercises include: SIMPLEX optimization; effects of interference and matrix effects on detection limits, analysis of water, plants and sediments; use of organic solvents in the ICP. Prerequisite: EENG 8822 or departmental approval.

**EENG 8824 Gas Chromatography and Mass Spectrometry** — Most samples occur as mixtures. Even if effective steps are taken to isolate the compounds of interest, a mixture is usually still left to be analysed. The importance of gas chromatography is explained by its ability to separate components in a mixture. In mass spectrometry, the mass spectrum is as unique to a compound as fingerprints are to people. When gas chromatography is combined with mass spectrometry (GC/MS), a technique is created with which the components of a mixture can be separated and identified. It is the purpose of this course to discuss the techniques of modern GC/MS as applied to the separation and identification of agricultural and environmental compounds. Prerequisite: 2 yr Science Diploma or equivalent.

**EENG 8900 Project Reports** — Intended for preparation of the final report for the Industry Sponsored Project, this course will provide the basis and format for all technical reports required in the program. Emphasis will be placed on the overall structure, organization of information and the logical progression of concepts. This course should be completed during the Common core portion of the program. Prerequisite: EENG 7700 or with departmental approval.

**EENG 8901 Project Proposal** — Assists the student conduct a literature review to clearly define the problem and to prepare an effective proposal for the project. The proposal is to be submitted to the department for approval before the student proceeds with the project. Prior to or during this course, the student will be seeking an industrial sponsor to assist in identifying a research project. The sponsor will provide occasional guidance and support relating to the analysis/research portion of the project. Prerequisite: EENG 8901.

**EENG 8902 Technical Presentations** — Allows participants to analyze the needs of their audience and then integrate their objective to the content and audience. Video feedback will be used extensively to provide immediate and practical comments as you develop comfort and confidence in business presentations. Prerequisite: EENG 7700.

**EENG 8903 Applied Research Project** — Designed for the student, in conjunction with an industry sponsor, to apply his/her specialty knowledge in solving a technical problem relating to the environment. The research project will contain some elements which are deemed to be innovative, experimental, or exploratory in nature. The department will form a committee to approve and evaluate the project. The committee will consist of three members: a technical advisor who is an expert in the research area, a staff member, and a member representing the industry sponsor. The committee will supervise the progress of the project, provide guidance, direct the research, and evaluate the final report. Prerequisite: departmental approval.

## ELECTRONICS

**ELEX 1105 Circuit Analysis I (T)** — 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 analysed. Average and RMS values for sine waves and rectangular waves are calculated. Labs are synchronized with lectures so that theory is studied and confirmed by application.

**ELEX 1110 Electronic Manufacturing Processes** — Teaches, 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 Digital Techniques I (T)** — Begins with a description of the fundamental theory of the decimal and binary numbers systems, then examine 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 combinational 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 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 1205 DC Circuits for Robotics** — 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 analysed. 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 1215 Digital Techniques 1 for Robotics**

— 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 1810 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 2105 Circuit Analysis 2 (T)**

— Introduces the behavior of electrical circuits and networks when driven by a single-phase alternating current (AC) source, preparation for courses in electronics and power systems. The course includes the sine wave, average and effective values; power and power factor; resistance, capacitance and inductance as elements in single-phase AC circuits; phasor diagrams, impedance, admittance, voltage, current and power diagrams, analysis of AC circuits with complex algebra; resonance and resonant circuits, high and low-pass filters; and, the application of circuit laws and theorems to single phase AC circuits, couple circuits. The circuits theory is verified using multimeters, sine wave generators and dual trace oscilloscopes. Prerequisites: ELEX 1105, MATH 1431.

**ELEX 2205 AC Circuits for Robotics**

— Introduces the behavior of electrical circuits and networks when driven by a single-phase alternating current (AC) source, preparation for courses in electronics and power systems. The course includes the sine wave, average and effective values, power and power factor; resistance, capacitance and inductance as elements in single-phase AC circuits; phasor diagrams, impedance, admittance, voltage, current and power diagrams; analysis of AC circuits with complex algebra; resonance and resonant circuits, high and low-pass filters; the application of circuit laws and theorems to single-phase AC circuits, coupled circuits. The circuit theory is verified using multimeters, sine wave generators and dual trace oscilloscopes. Prerequisites: ELEX 1205.

**ELEX 2115 Digital Techniques 2 (T)**

— Builds on the knowledge gained in ELEX 1115. Studies the utilization of logic gates in larger combinatorial circuits; magnitude comparators; combinational arithmetic hardware; sequential logic devices (D, J-K, and T flip-flops); asynchronous and synchronous 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 parallel bus structures. Prerequisites: ELEX 1105, ELEX 1115, COMM 1143, MATH 1431, ELEX 2120\* (\*recommended to be taken concurrently).

**ELEX 2120 Electronic Circuits I**

— Explains how electronic circuits work, how to analyse, 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 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.

**ELEX 2220 Digital and Electronic Circuits**

— Begins with sequential logic devices; counters, shift registers and their application in systems; noise margins; propagation delay and loading considerations. The second half is an introductory electronics circuits course that provides the foundation for subsequent electronics courses in Robotics. Prerequisites: ELEX 1205, ELEX 1215, MATH 2342\* (\*may be taken concurrently).

**ELEX 2805 Illumination** — Deals with the types and characteristics of lighting sources; quantity and quality of light; lighting units, terminology and calculations. Prerequisite: ELEX 1810.

**ELEX 2825 Process Instrumentation**

**(Food Tech)** — Presents the principles and practices of automatic control systems for food processing plants. The operation and application of common measurement systems for pressure, temperature, and flow are described. The principle of negative feedback and closed loop control strategies are introduced. Principles of Programmable Logic Controllers (PLC) are presented so that food technologists can communicate their needs to PLC programmers. Prerequisite: PHYS 2145.

**ELEX 2830 Process Measurement**

— Introduces standard methods of applying commercial instruments to the measurement of pressure, level, flow, and temperature variables. The course includes an introduction to the principles of regulators and process controllers. Emphasis is placed on lab exposure to industrial instrumentation equipment.

**ELEX 2835 Instrumentation for Mechanical Systems** — Introduces basic instruments used for measuring pressure, temperature, level, density and flow. Instrument static and dynamic performance. Instrument application to industrial processes. Design of pneumatic and hydraulic measurement and control equipment using high-gain amplifiers and negative feedback. Basic principles of automatic control, process, dynamic behavior and controllability. On/off, proportional, integral and derivative control. Control strategy. Ratio, cascade, multivariable and feed forward systems. Introduction to computer control.

**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 behavior 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 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.

**ELEX 2860 Electronic Prototype Manufacturing** — Teaches through design and manufacture of specific electronic projects, teaches 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.

**ELEX 2865 Introduction to Computer Hardware** — Covers assembler and C programming for interfacing digital and analog I/O. Explores ports, buffers, latches, decoding, memory, 8254 timer chip, 8259 Programmable Interrupt Controller and the 8250 UART. Prerequisite: COMP 2510, COMP 2720.

**ELEX 2990 Cooperative Education Workterm 1** — Applies 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 four months.

**ELEX 3205 Data Acquisition/Signal Conditioning** — Examines the application and design of precision analog interface and signal conditioning systems. Topics include the specification, design and evaluation of amplifier systems commonly used in transducer interfacing applications; high accuracy and stability signal conditioning design techniques and analog signal transmission with emphasis on the 2-wire current loop. A strong practical approach is ensured by lab exercises and projects. Prerequisites: ELEX 2105, ELEX 2120, MATH 2431.

**ELEX 3210 Sensors for Measurement and Control** — Introduces 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 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 analyse 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 Microcontroller Systems I** — 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, 2115, 3320\* or 3515\*, or 3205\* (\*may be taken concurrently).

**ELEX 3310 Pulse Techniques** — Introduces pulse signal circuits such as clippers and clamps, transistor switches, astable and monostable multivibrators, Schmitt triggers, ramp generators, DC to DC converters, and phase locked loops. Both discrete transistors (bipolar and FET) and CMOS integrated circuits are used in building these circuits. Each circuit is analysed in detail and its practical application is considered. Prerequisite: ELEX 2105, 2115, 2120, MATH 2431.

**ELEX 3315 Applications Software** — Designed as 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 Electronic Circuits 2 (Control)** — Continues from 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 3321 Electronics Circuits 2**

**(Robotics)** — 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 2120, MATH 2342.

**ELEX 3325 Electrical Equipment and PLC's**

— 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, stepper motors, relay and PLC motor control. Prerequisite: ELEX 2105 or 2135, ELEX 2120, MATH 2431, PHYS 2143.

**ELEX 3330 (ELEX 411) Programmable Logic Devices**

— Introduces 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. And ELEX 3305\* (\* may be taken concurrently).

**ELEX 3520 Electronic Circuits 2**

**(Telecom)** — Provides further knowledge of linear and non-linear electronic circuits with emphasis on their application in telecommunications. Topics include tuned amplifiers, control of gain, stability of tuned amplifiers, clippers and clamps, timer circuits, switching power supplies, differential and operational amplifier circuits and active analog filters. In a series of labs, students confirm lecture theory and further improve their hands-on skills in the application and use of test instruments. Prerequisite: ELEX 2105 or 2135, 2120, MATH 2431.

**ELEX 3525 Data Communications**

— Introduces data communications. The course focuses on the ISO physical and data link layers. Topics include physical layer standards, character codes, transmission media and characteristics, encoding and modulation techniques, error detection and control methods, protocols and the ISO reference model. Lab activities reinforce lecture topics. Prerequisite: ELEX 3305\* and ELEX 3315\* (\*may be taken concurrently).

**ELEX 3530 Telecommunications I**

— Covers the make-up of an information signal and the theory of modulation is explored. Analog telecommunications circuits commonly used for amplitude, frequency and phase modulation and demodulation are studied. The building blocks for transmitters and receivers are identified and related to circuits studied in this and other courses. The schematic diagram of a modern microprocessor-controlled radio is used as a model for detailed analysis. Prerequisite: ELEX 2115, 3520\* (\*may be taken concurrently).

**ELEX 3535 Digital Signal Processing**

— Introduces Digital Signal Processing techniques. Topics include continuous and discrete-time signal conditioning systems, the Z-transform, the Discrete Fourier Transform, the Fast Fourier Transform, and the designs and implementation of FIR and IIR filters. Digital filters are designed using Matlab software and then implemented using a Motorola 56002 DSP Evaluation Board. Prerequisites: ELEX 2120, 3305\*, MATH 3431 (\*may be taken concurrently).

**ELEX 3990 Cooperative Education**

**Workterm 2** — Continues with work experience in a paid position within industry/business, acquired through the Cooperative Education office (minimum 12 weeks, maximum four 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 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 3205, ELEX 3305, ELEX 3215\* (\* may be taken concurrently).

**ELEX 4210 Analysers for Process Automation**

— 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 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 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 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 4315 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 Industrial Electronics** — 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. Prerequisite: ELEX 3320 or 3515 or 3210, 3310 or 3205, PHYS 2143.

**ELEX 4325 Microcontroller Systems 2** — 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 analyser and program simulator for fault-finding and analysing instruction execution; interrupt prioritization. Prerequisite: ELEX 3305, 3310.

**ELEX 4330 Technical Project (Control)** — Allows students 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, 4340\*, 4315\*, 4320\*, 4325\*, COMM 2443\*, (\*may be taken concurrently), OPMT 1165\*\* (\*\*must be taken concurrently).

**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 behavior of closed-loop control systems. Classification of systems into type, sensitivity to parameter variation, and system stability. Design of compensated motion control systems based on the Root Locus method and the Frequency Response method are discussed. The Z-transform is introduced as an aid in the design of digital rather than analog controllers. Students use engineering software to aid them in problem-solving. Both analog and digital motion control systems are designed, assembled and tested. Prerequisite: ELEX 3205.

**ELEX 4336 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 behavior of closed-loop control systems. Classification of systems into type, sensitivity to parameter variation, and system stability. Design of compensated motion control systems based on the Root Locus method and the Frequency Response method are discussed. The Z-transform is introduced as an aid in the design of digital rather than analog controllers. Students use engineering software to aid them in problem-solving. Both analog and digital motion control systems are designed, assembled and tested. Prerequisites: ROBT 3341/3351/3356, MATH 3342, ELEX 3321.



**ELEX 4340 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 and 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, 3315, 3320 or 3515, and 3310.

**ELEX 4405 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. 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 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 Electrical Equipment and PLCs —**

Continues from ELEX 3325 with a more detailed study of AC and DC motors and their applications. This is followed by a study of electrical protection that 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 Autocad and PLC Projects —**

Covers to program large scale industrial PLC and simulate control systems. Students will have the opportunity to use Autocad to prepare drawings for Industrial Systems projects.

**ELEX 4525 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 modeling 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; noise performance of amplifiers. Labs are project-oriented, requiring students to design, build and test various circuits applying theoretical knowledge. Prerequisite: ELEX 3520, 3530, 4545\* (\*may be taken concurrently).

**ELEX 4530 Telecommunications 2 —**

Introduces the concepts of several widely-differing transmission systems. Topics include electromagnetic wave propagation, spread-spectrum and frequency-hopping systems, video signal transmission, cellular and PCS radio systems, and satellite radio links. An introduction to the General Purpose Interface Bus (GPIB) is included. Prerequisites: ELEX 3305, ELEX 3530 and 4545\* (\*may be taken concurrently).

**ELEX 4540 Local Area Networks —**

Covers the inner workings of LANs with emphasis on the lower ISO layers. Hardware and software networking concepts are taught in the context of IEEE 802.3 Ethernet and IEEE 802.5 Token Ring. Topics include network topology and components, transmission media, cable testing, encoding methods, medium access control, Novell Netware installation and configuration, and LAN troubleshooting. LAN to WAN topics include interconnection components such as bridges, routers, and gateways. A series of computer networking lab experiments complement lecture topics. Prerequisites: ELEX 3305, ELEX 3315 and 3525.

**ELEX 4545 Transmission Devices —**

Introduces the various transmission media and systems used in modern telecommunications networks. Topics include open-wire and coaxial transmission lines, waveguides, fibre-optic lines, elemental and reflection-type antennas, microwave frequency transmission devices, and light-wave transmission systems. Prerequisites: PHYS 2143 and ELEX 3530.

**ELEX 4550 Wide Area Networks —**

Introduces the North American telecommunications network. Telephony topics include the evolution of the telephone system, operation of the telephone set, units of measurement used in telephony, traditional signalling techniques, switching and traffic concepts, central office switching equipment, frequency division and time division multiplexing, with emphasis on PCM. Networking topics include the most common protocol and architectures such as HDLC, X.25, TCP/IP, ICMP, ISDN, SONET, and ATM. Prerequisites: ELEX 3305, ELEX 3315, ELEX 3525, 4540\* (\*may be taken concurrently).

**ELEX 4855 Electronic Image Displays —**

Introduces to the techniques and mechanisms for digital image acquisition, display, storage and processing. System design is presented with reference to economic and technical considerations. 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 4990 Cooperative Education**

**Workterm 3 —** Designed as an optional, additional workterm and may be taken to complete a project in industry that started during a previous workterm, or to satisfy student's interest in additional work experience, prior to graduation.

## ENGLISH

**ENGL 1177 Academic Writing** — Presents the study and application of the principles of university level discourse with emphasis on expository and persuasive writing. Prerequisite: Grad 12 English.

## ELECTRONEUROPHYSIOLOGY

**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 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 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), polysomnography 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 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.

## ENVIRONMENTAL HEALTH

**ENVH 1100 Introduction to Environmental Health** — Introduces the student to the role, duties, responsibilities and behavior 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 Pest Management** — Introduces to pests of public health significance. Through lectures and laboratories, the student will examine the life history, health significance and methods of identification of pests encountered by the graduate. Current chemical, physical and biological control methods are examined in detail.

**ENVH 1143 Pools and Recreational Water** — Introduces 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. This determination includes: basic geological information, soil formation, profiles, structures, textures, porosity, pH, permeability, etc. Interpretation of soil and air photo maps is also included.

**ENVH 1215 Soil Science** — Provides an introduction to the development and properties of soil. These properties include: basic geological characteristics, soil formation processes, profiles structures, textures, porosity, pH and permeability. The sampling and assessment of soils at contaminated sites will be examined with emphasis placed on remedial measures. The interpretation of soil and air photo maps will also be covered. Specific emphasis will be given to quality assurance and quality control measures along with the operation and maintenance of all equipment used in this course.

**ENVH 1220 Hydrogeology** — Provides an introduction to the concepts and methods used in hydrogeology which are most pertinent to the needs of the Environmental Health professional. These needs relate to the role of the Environmental Health Officer/Public Health Inspector in preventing and solving ground water contamination problems. These principles are used to assess risk to both health and the environment.

**ENVH 1225 Hydrology and Hydrogeology** — Introduces the hydrological processes occurring both above and below the earth's surface. Main concepts and methods used in mapping and monitoring these systems will be presented. Emphasis will be placed on groundwater resources with regard to aquifers, wellhead protection, potential contaminants and remedial measures. Case studies of known hydrogeological contamination sites will also be reviewed.

**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 1460 Fire Prevention and Security** — *Under development.*

**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. Prerequisites: ENVH 1210 and ENVH 1220.

**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 wastewater treatment and sewage disposal systems is covered in detail. Prerequisites: ENVH 1210 and ENVH 1220.

**ENVH 2266 Epidemiology and Biostatistics —**

Enables the student to apply basic epidemiological principles to assess the distribution and causes of disease in the population, and to use introductory biostatistical methods to evaluate data critically and study conclusions. Prerequisite: MATH 1821.

**ENVH 2700 Biotstatistics —**

Introduces concepts of descriptive and inferential statistics which are relevant in the health field. Topics include: the organization and graphical presentation of data, frequency distributions, measures of central tendency, hypothesis testing, correlation and regression, and analysis of variance. An appropriate software package is utilized in this course.

**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 solid waste and design of a sanitary landfill site.

**ENVH 3350 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 3400 Industry Project I —**

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 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.

**ENVH 3500 Human Relations —**

Teaches students how to function effectively in a team situation and discusses 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.

**ENVH 3600 Environmental Assessment —**

Introduces the student to common chemical and physical factors that potentially constitute environmental health hazards. Examples include gases and vapors, 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. Prerequisites: MATH 1821 and 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 behavior as it relates to environmental health organizations. The student is exposed to the concepts and theories of organizational behavior; design, dynamics, change, motivation, behavior 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 vapors, 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.

**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 vapors, 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.

**ENVH 7001 Solid and Hazardous Waste**

— Examines the disposal of solid and hazardous wastes. Topics in the solid waste section include monitoring a disposal site, land reclamation and dealing with illegal disposal sites. Special wastes such as septage and agricultural wastes are considered. The hazardous waste section includes topics such as designing, monitoring and inspecting a hazardous waste management facility. Potential health risks are discussed. In addition to developing core competencies in environmental health, this course enables students to enhance their critical thinking, problem-solving, communication and interpersonal skills. Prerequisite: ENVH 3200.

**ENVH 7002 Outdoor Air Quality** — Builds on the concepts covered in ENVH 4600 as they apply to outdoor air quality. Students examine the role of the PHI/EHO in conducting investigations and recommending control measures. The potential health risks associated with outdoor air are also discussed. Students develop investigative skills and creative problem-solving and diagnostic abilities within the context of outdoor air quality assessment. Prerequisite: ENVH 4600.

**ENVH 7266 Epidemiology** — Applies critical appraisal skills in examining sources and uses of epidemiologic data for public health field work and health services planning, evaluation and administration. This course provides practical experience in outbreak investigation using case studies. Data collection methods, designs for applied research studies, techniques for data analysis, and scientific communication are explored. Upon completion of this course students will be able to conduct field investigations under supervision, assess the validity of scientific reports and prepare reports for publication. Students will enhance their problem-solving, critical thinking, reading and communication skills within the context of epidemiology and biostatistics. Prerequisite: ENVH 2266.

**ENVH 7400 Industry Project 1** — Applies team-building, communication, organizational skills, problem-solving and critical thinking to the development of a proposal for an industry sponsored/related project. The project proposed in this course will be conducted and presented in ENVH 7410. Students are encouraged to develop close contacts with the industry in order to develop proposals relevant to the field. Students will conduct a literature review, write a proposal and present the proposal orally. This course has an off-campus practicum requirement.

**ENVH 7410 Industry Project 2 —**

Continues to develop the team-building, communication and organizational skills applied in ENVH 7400. 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.

**ENVH 7500 Practicum** — Consists of 12 weeks of work experience (off-campus practicum) at a health agency or other approved agency. The practical experience will be coordinated by a supervisor who holds the C.P.H.I.(C). The student will be exposed to and participate in a range of basic inspection programs. Successful completion of this practicum is one of the requirements for national certification.

**ENVH 7606 Information Technology in Environmental Health** — Focuses on the application of computerized information systems in environmental health organizations. Through projects and assignments students will critically evaluate the information technology needs of an organization, propose solutions using problem-solving skills, constructively challenge assumptions and assess scientific and business literature using reading skills. This is a guided learning (distance education) course.

**ENVH 8001 Environmental Health Risk Assessment** — Examines the concepts of risk assessment, risk perception and risk communication as they relate to the environmental health field. Using case studies, students will apply communication, problem-solving, critical thinking and teamwork skills. Prerequisites: ENVH 7001 and ENVH 7002.

**ENVH 8400 Research Methods —**

Examines the components of the research process and prepare a research proposal. Students work independently under the guidance of a committee to select a research topic in a specialty area and develop a detailed research proposal. Upon successful completion of this course, the student will conduct the research project in ENVH 8410 (Applied Research Project). In addition to developing core competencies in the research process, students will enhance their communication, problem-solving, critical thinking and reading skills. This is a guided learning (distance education) course. Prerequisite: ENVH 7266.

**ENVH 8410 Applied Research Project —**

Focuses on the application and integration of knowledge and skills acquired in ENVH 8400 (Research Methods). Students will independently complete the research project under the supervision of a committee, prepare a formal research report and present the research findings. Students will utilize time-management strategies, oral and written communication skills and critical thinking/problem-solving abilities. This is a directed studies course in guided learning (distance education) format. Prerequisite: ENVH 8400.

**ENVH 8500 Internship** — Focuses on the application and integration of environmental health concepts and principles in a real-life work situation. Students will enhance their skills in critical thinking, problem-solving, decision-making, communication and interpersonal relationships by participating in a variety of programs within an environmental health or other approved agency. Students will prepare interim and final reports based on their field experience. The internship is 12 weeks long and students are expected to work the same hours as the personnel at the agency to which they are assigned. This course consists of an off-campus practicum requirement. Prerequisite: ENVH 7500.

## FINANCIAL MANAGEMENT

**FMGT 1100 Accounting I** — 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. **Note:** In order to transfer this course towards the Financial Management Program students must receive a grade of 65 per cent or better.

**FMGT 1105 Accounting I for Financial Management** — Provides 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 1110 Financial Management I** — 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 1151 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.

**FMGT 1154 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.

**FMGT 1925 Financial Management** — Emphasizes managerial accounting/costing as the ultimate purpose and will prepare students for a later Managerial Accounting course, if required. Students will be exposed to the general ledger system as a database. Its design requires anticipation of information required by insiders for future managerial decision-making in addition to the generation of financial statements for outsiders. (Note: Only students enrolled in the Applied Operations Management Senior Certificate can register for this course.)

**FMGT 2100 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 2105 Accounting 2 for Financial Management** — 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 2110 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 behavior, cost-volume-profit analysis, standard costs, budgeting, pricing products and services, relevant costs and capital budgeting. **Note:** Full-time Management students who receive less than 65 per cent in this course will be removed from the full-time program and will not be re-admitted until they reapply to the program and complete FMGT 2100 with a grade of 70 per cent or better. Prerequisite: FMGT 1105 or (FMGT 1100) with 65 per cent or better).

**FMGT 2540 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 or 1100.

**FMGT 2710 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 practise 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 or 1100.

**FMGT 2910 Finance Reports** — Provides Financial Management students with skills in formal reporting. They will have the opportunity to analyse 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 or 1100.

**FMGT 3110 Financial Accounting I** — 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 Cost and Managerial Accounting I** — 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 3221 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 3222 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.

**FMGT 3224 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.

**FMGT 3310 Auditing I** — 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 of 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 Taxation I** — 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 Finance I** — The two major aims of corporate finance are (1) the efficient allocation of funds within the enterprise and (2) the raising of funds on as favorable terms as possible. This course focuses on the following topics related to these overall aims: corporate organization and taxation, 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 3550 Business Finance for International Trade and Transportation Logistics I** — 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.

**FMGT 4550 Business Finance for International Trade and Transportation Logistics 2** — Continues from FMGT 3550 on 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.

**FMGT 3560 Finance I 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 3610 Security Analysis I** — 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 licenced 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 Advanced Microcomputer Applications I** — 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 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 Cost and Managerial Accounting 2** — Emphasizes relevant costing for decision-making, cost behavior, cost allocation, joint and by-products process costing, linear programming and mix and yield variances. Prerequisite: FMGT 3210.

**FMGT 4310 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 Taxation 2** — Expands the student's 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 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 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 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 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 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 and 3610.

**FMGT 4560 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.

**FMGT 4570 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, ECON 2200.

**FMGT 4620 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 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 4730 Great Plains "Dynamics" for Managers** — Introduces the use of Enterprize Information systems in support of management decisions. The course uses Great Plains Dynamics software plus several generic third-part products in a task-approach to understanding the structure and functions of Windows-based EIS's. A hands-on, practical approach is used, and material are included in the course fee. Prerequisites: A good grasp of Windows functionality and a background in accounting.

**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 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 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.

**FMGT 7121 Advanced Accounting** — Expects students to acquire a working knowledge of the current CICA Handbook recommendations as well as alternative approaches to each issue addressed. They will apply this knowledge to situations presented in case studies or complex questions. In reviewing assignments and analyzing case studies, particular emphasis will be placed on how the accountant exercises professional judgment to resolve a problem, what resources may be available to assist him/her to reach an appropriate solution, and finally how the results should be communicated to the client. Prerequisite: FMGT 4110.

**FMGT 7210 Advanced Management Accounting** — Examines, in depth, topical areas from the discipline of management accounting with reference to and synthesis of applicable case material. Topical areas include constraints, budgets, cost-benefit analysis, goal congruence, management control systems, transfer pricing, performance measurement, total quality management, linear programming, regression analysis, and ethical decision-making. Prerequisite: FMGT 4210.

**FMGT 7310 Advanced Auditing** — Addresses issues and challenges faced by the auditing profession in today's environment including the assessment of risk of an audit, the use of computer technology in completing the audit file, and the increasing litigation against the profession. Students will be expected to use the assigned textbook and other sources to research selected topics. Case studies will be used extensively. Prerequisite: FMGT 4310.

**FMGT 7410 Taxation of Close Corporations** — Presents an integrative tax course that requires students to examine the combined impact and timing of relevant tax statutes (i.e. Income Taxes, GST, PST, PTT), probate fees and transaction costs on closely held corporations and their shareholders. Because these shareholders may have some discretion on when and in whose hands income is taxed, participants will be evaluating taxation alternatives as between shareholders, their operating companies, and other vehicles such as holding companies and family trusts. This will require students to acquire and demonstrate a detailed knowledge of the taxation of individuals, corporations and trusts. Prerequisite: FMGT 4410.

**FMGT 7710 Management Information Systems** — Provides an understanding of the relationship between information, technology, accounting information systems, business strategy and organizational improvement. They will examine information technology as an enabler and facilitator of business strategy and as an accounting and control tool to track performance and improve managerial decision-making. Cases and assignments will focus on small to medium-sized Canadian organizations looking for appropriate solutions to information technology and accounting issues. Prerequisites: BUSA 1100, FMGT 4210, and FMGT 4710.

**FMGT 7910 The Business Environment** — Provides student with the skills necessary to operate in a complex professional world that offers problems with no textbook solutions. Specifically, the course will deal with the economic and legal environment, risk management, ethical behavior in business, cultural diversity, international trade, and problem-solving through critical thinking. The student will relate what he/she has learned to some of the dominant industries in B.C.

**FMGT 8120 Accounting Theory** — Reviews the history of accounting and the theories underlying current accounting practice. Alternative theories and methods are critically assessed and possible future directions evaluated. Prerequisite: FMGT 7120 or 7121.

**FMGT 8910 Integrative Business Management Practice** — Designed to fulfill the role of a “capstone” to the degree program. Its overall objective is to enhance the students’ skills by supplementing their knowledge of accounting with a thorough understanding of the management techniques and practices required of accountants as members of the senior executive team. This course includes a major project related to the student’s own work situation. Prerequisite: Seven of the following courses: FMGT 7910/7121/7210/7310/7410/7510/7710/8120 (note: may be taken concurrently).

## FOOD

**FOOD 1030 Biology** — Presents a study of the principles underlying living phenomena including the organizational attributes of living matter. Development of systems 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 1241 Zoology I for 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. This course focuses on the theoretical aspects of the subject area.

**FOOD 2010 Food Processing I** — 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: FOOD 1090, BIOT 1020 or microbiology training.

**FOOD 2020 Food Microbiology** — Presents the application of microbiology to food manufacturing; the isolation of micro-organism 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 2241 Zoology 2 for 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. This course is a “lab” course and builds on the theoretical material presented in FOOD 1141. Prerequisite: FOOD 1141.

**FOOD 3010/4010 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, flavorings, coloring and preservatives will be discussed. Prerequisite: FOOD 2010.

**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.

**FOOD 3030 Quality Control I** — 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 color in foods. Prerequisite: MATH 2441.

**FOOD 3040 Food Analysis I** — 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 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 Food Processing 3** — See FOOD 3010. Prerequisite: FOOD 3010.

**FOOD 4020 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 2145.

**FOOD 4030 Quality Control 2** — Covers the sensory evaluation of food; facility design and 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 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.

## GEOGRAPHIC INFORMATION SYSTEMS

**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 modeling and representation, storage and retrieval of spatial data, concepts of database systems, manipulation and analysis features of GIS.

**GIST 5108 Fundamentals of Mapping** — Examines the technologies associated with the acquisition and modeling 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.

**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 students to research project topics, present a project proposal, establish supervisors, identify sources of data and begin data acquisition.

**GIST 5121 Applied Mathematics I** — 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 I** — 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 modeling, 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 Customization and Modeling** — Examines raster and vector methods of modeling 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 concepts and foundations of remote sensing; 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 permission of the department.

**GIST 6121 Applied Mathematics 2** —

Provides students with basic knowledge of statistical methods currently used. The course includes the fundamentals of descriptive statistics, measures of central tendency measures of dispersion, probability, discrete probability distributions, expectations, variances, continuous probability distributions (normal, student, chi squared, fisher, tau distribution), confidence intervals, hypothesis testing, comparison problems of means and variances, ANOVA test, simple linear regression, Helmert's transformation. This course is a required foundation course for the GIS Advanced Diploma program. 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 modeling, 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.

## HEALTH MANAGEMENT

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**HMG 4140 Budgeting in Health Care** —

Designed to provide the first level manager with the terminology, principles and tools required to prepare an operating and capital budget in a B.C. health care organization. It examines budgeting within the B.C. health care context and the operating budget at the organizational and departmental level. It then examines the capital budget process.

**HMG 4150 Human Resource Management** —

Examines the total staffing process including job analysis and description, interviewing, training and performance appraisal.

**HMG 4210 Health Care Organizational Behavior 2** —

Continues from Health Care Organizational Behavior 1 with more emphasis on group behavioral concepts and organizational concepts that impact on practical management. It investigates the variables of group dynamics such as conflict, power and politics. It introduces and analyzes the concept of the behaving organization. It assesses the effects generated by internal and external variables on organizational behavior. Prerequisite: BUSA 7250.

**HMG 4310 Conflict Management** —

Examines the various interpersonal styles of conflict management. It then explores the structural approaches to managing conflict. It continues with the use of negotiations to resolve conflict and ends with third-party conflict resolution. Prerequisite: BUSA 7250.

**HMG 5140 Financial Administration for Health Care Managers** —

Introduces accounting tools and concepts of health care systems. Examines cost accounting, program accounting and management reporting. Prerequisite: HMG 4140.

## HUMAN RESOURCE MANAGEMENT

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**HRMG 1995 Labor Management** —

Introduces the student to many of the labor and management functions required in any well-run organization. The student will be exposed to some of the problems, issues and opportunities faced by management in a modern organization. Students will have the opportunity to suggest desired outcomes and recommend action on actual business issues. (Note: Only students enrolled in the Applied Operations Management Senior Certificate can register for this course.)

**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 Industrial Relations (Basics)**

— Presents a detailed analysis of selected labor/management problem areas with emphasis on the solution of practical problems in industrial relations.

**HRMG 3010 Human Resource/Industrial Relations Management** —

Introduces the major human resource and industrial relations processes and issues in 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 and abilities required for effective interviewing, performance management, compensation reviews, labor contract negotiations, training and development programs, grievance and collective agreement administration. It also reviews relevant employment law.

**HRMG 3050 Management Workshop** —

Explores day-to-day management issues. Specific topics include organizational behavior, industrial relations, interviewing skills, job evaluation and the introduction of change.

**HRMG 3060 Human Resource Management OCHS** —

Provides students with a working knowledge of recruitment and selection performance appraisals, job evaluations and job descriptions.

**HRMG 3095 Quality Management** —

Presents concepts of individual perception, feelings, actions, and behaviors. How these relate to achieving organizational objectives. Topics include leadership of work groups, setting objectives, training, allocating work, communication, and performance measures.

**HRMG 3100 Human Resource Management** — Designed for persons interested in management and/or supervision. It develops an understanding of significant human resource management processes 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 on practical application of the techniques studied. Prerequisites: BUSA 1100 and ORGB 2100.

**HRMG 3130 Competency Design and Analysis** — Develops knowledge and skills at defining and describing workplace competencies, tasks and requirements and their links to other human resource management processes. Methods of job analysis, redesign/reengineering and position analysis are explored. Practical techniques for creating effective work assignment/decriptions and specifications are introduced.

**HRMG 3150 Human Resource Management Systems I** — Introduces systems and procedures associated with human resource information collection and storage with emphasis on 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 Human Resource Dynamics Workshop** — Concentrates on the development of skills for building and maintaining effective relationships, including conflict resolution and team skills. 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 Industrial Relations** — Presents a detailed analysis of selected labor/management problem areas with emphasis on the solution of practical problems in industrial relations.

**HRMG 3220 Industrial Relations for OCHS** — Presents an introductory analysis of the fundamental issues and facts of labor-management relations. Special emphasis is given to collective agreement content and interpretation, bargaining and basic labor economics.

**HRMG 3300 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 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 Training and Development** — Develops ability to design and implement a training program with emphasis on practical problems of training in industry. Prerequisite: HRMG 3150, 3170.

**HRMG 4150 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 Collective Bargaining** — Introduces the fundamental issues and facts of labor-management relations. Special emphasis is given to collective agreement content and interpretation, bargaining and basic labor economics. Prerequisite: HRMG 3200.

**HRMG 4401 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 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 Directed Studies** — Designed to give students practical experience in completing a special human resource assignment in an organizational setting.

## MANUFACTURING

**MANU 3310 Material Removal Processes** — Evaluates material removal processes based on their relative merits; priorities of each process will be examined. Students will receive hands-on knowledge of various machine tools used for metal removal. Prerequisite: MECH 1210.

**MANU 3312 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. Prerequisite: MECH 1210, MECH 2201.

**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. Prerequisites: MECH 1210, MECH 2201, MECH 2240.

**MANU 3316 Advanced Materials** — Investigates application of materials for 'extreme services' such as high temperature, corrosion or cryogenic applications as well as non-traditional materials and processes currently found in modern manufacturing. These include plastics, composites and their forming processes as well as powder metallurgy and ceramics. Prerequisite: MECH 1210, CHSC 2205, MECH 2240.

**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 linear and angular as well as surface texture and flatness measurements using block gages, sine bars, optical instruments, electronic comparators and precision measuring instruments. Course covers fundamentals and application of inspection and mass production gaging such as 'Go' and 'NoGo' gages and 'Air Gages'. Prerequisite: MANU 3310, MANU 3314.

**MANU 4410 Material Joining Processes** — Investigates methods of material joining using various welding processes. Practical part of the course is focused on application of CSA W59 standard and welding procedure specification and qualification according to CSA W47.1 standard. Prerequisite: MECH 1210.

**MANU 4412 Production Planning** — Examines the relative merits of different manufacturing processes from quality, reliability and productivity point of view. The choice of production equipment and the sequence of operations to achieve the most economic production are addressed. Cost analysis of process plan for any given quantity of parts is used for production cost estimating. Prerequisite: MANU 3310, MANU 3312, MANU 3314.

**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. Prerequisite: MANU 3312.

**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. Prerequisite: completion of Level 1, 2 and 3 courses. Corequisite: COMM 2449.

**MATHEMATICS**

**MATH 0005 Introduction to Technical Mathematics** — Covers those topics in technical mathematics which are important for success in BCIT Engineering and Health 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 will be accepted as an equivalent to the Mathematics 12 entrance requirement for BCIT Engineering and Health programs. A grade of 65 per cent or better is required where Mathematics 12 with a "C+" is required. This course is equivalent to MATH 0001 which is offered through Part-time Studies.

**MATH 1151 Computer Skills and Applications for Biomedical Electronics** — Covers 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 spreadsheets for organizing and analysing numerical data, implementing numerical methods, producing graphics and printing reports. Basic computer programming concepts, program design, algorithms, input/output, control of program flow (branching, looping, decision-making). Prerequisite: MATH 12 C+.

**MATH 1342 Technical Math for Robotics I** — Covers trigonometric functions, identities, solution of triangles, graphing and addition of sinusoidal functions. Complex numbers, rectangular/polar conversions, phasor representation of sinusoidal waveforms. Common and natural logarithms, logarithmic/semilogarithmic graphs, decibels, exponential growth and decay. Systems of linear equations, determinants, matrices. Rotations and transformations in 3 dimensions. Applications to electrical networks, circuit transients, AC theory, and motion in space. Prerequisite: MATH 12 C+.

**MATH 1401 Technical Mathematics for Building I** — Covers radian measure, trigonometric functions, solution of triangles and vectors. 3D trigonometry and geometry. Irregular areas and volumes. Exponential functions and financial mathematics. Logarithms and noise levels in buildings. Corequisites: PHYS 1140, CIVL 1200.

**MATH 1411 Technical Mathematics for Chemical Sciences I** — Covers graphical linear programming with applications from chemical sciences and industry; exponential/logarithmic theory and transformations, common and natural logarithms, logarithmic/semilogarithmic graphs with application to growth and decay functions, exponential and logarithmic equations with various applications from chemical engineering; trigonometric functions of any angle, vectors, solution of triangles, graphs of trigonometric functions, trigonometric identities and equations with applications. Prerequisite: MATH 12.

**MATH 1421 Technical Mathematics for Civil and Structural I** — Reviews basic algebra. Solution of equations and systems of equations. Trigonometry, vectors, radian measure with application to statics. Irregular areas and volumes. Functional variation. Logarithms and solution of logarithmic and exponential equations. Prerequisite: MATH 12 C.

**MATH 1431 Technical Mathematics for Electronics I** — Covers 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 1441 Technical Mathematics for Biological Sciences I** — 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, antiderivatives, indefinite integral, definite integral and area under a curve. Introduction to microcomputers using Excel 5.0. Prerequisite: MATH 12 C.

**MATH 1451 Technical Mathematics for Renewable Resources I** — Covers measurement accuracy and precision, word problems, ratio, proportion and variation; mensuration including applications of geometry, trapezoidal and Simpson's rules; functions and graphs, quadratic, logarithmic and exponential functions, graphs on logarithmic scales. Prerequisite: Math 11 C+.

**MATH 1461 Technical Mathematics for Wood Products Manufacturing I** — Covers numerical computations. Linear and quadratic equations with emphasis on applied word problems. Plane and solid figure geometry problems concerning shaping of wood material. Trigonometry of right and oblique triangles, vectors. Logarithmic functions, logarithmic and exponential equations and applications from growth and decay processes.

**MATH 1471 Technical Mathematics for Petroleum I** — 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, trigonometric equations and inverse functions. Prerequisite: Math 12.

**MATH 1491 Technical Mathematics for Mechanical I** — 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 a strong emphasis on illustrating the mathematics with applications from technology, engineering and the physical sciences. Prerequisite: Math 12.

**MATH 1501 Technical Mathematics for Mining I** — 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, trigonometric equations and inverse functions. Prerequisite: Math 12.

**MATH 1511 Technical Mathematics for Geomatics I** — Covers technical mathematics with emphasis on its application to surveying: trigonometric functions of any angle, solution of triangles, identities and trigonometric equations; spherical trigonometry; systems of linear equations; analytic geometry. Prerequisite: Math 12.

**MATH 1751 Technical Mathematics for Nuclear Med** — Emphasizes the integration of problem-solving strategies with mathematical and calculator skills in the context of relevant nuclear medicine applications. Topics include unit conversions (Ci to Bq), ratio/proportion (radiation), logarithms, exponential growth and decay (physical, effective, biological half-lives, transmission of shielded radiation), graphing techniques (logarithmic), appropriate curve fitting (least squares), curve stripping, introduction to differential and integral calculus and first order differential equations (decay formulae) and an introduction to descriptive statistics. Prerequisite: Math 12 C+.

**MATH 1781 Technical Math for Biomedical Engineering** — Covers systems of linear equations and determinants with application to electrical networks. Logarithmic and exponential functions including the study of electrical transients, dB gain, logarithmic and semilog graphing. Trigonometric functions and the graphs of the sinusoidal functions — right triangle geometry with application to impedance and admittance diagrams. Complex numbers, rectangular/polar conversion and AC circuit applications. Number base conversion and binary number operations with a brief introduction to Boolean logic and Karnaugh mapping. Prerequisite: Math 12 C+.

**MATH 1791 Technical Mathematics for ENPY** — Covers unit conversion, percentages, percentage change and relative change. The equation of a straight line. Systems of linear equations in two and three variables with applications to chemical mixtures and electric circuits. Exponential and logarithmic functions with applications to population growth, human physiology, radioactive decay, decibels, electric transients. Time constants and half-life. The use of semi-log and log-log graphing to fit experimental data to power-law and exponential models. Angular measure and right-angle trigonometry. Graphs of the sine and cosine functions. Introduction to AC circuits: voltage triangles, impedance triangles, RMS values. Prerequisite: Math 12 C+.

**MATH 1821 Technical Mathematics for Env 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.

**MATH 1831 Mathematics I for ENVT** — Provides basic technical mathematical skills essential to the ENVT student. Topics include algebra review, unit conversion (metric and imperial), ratio/proportion (ppm, ppb), significant digits, percent error, area/volume calculations, linear, logarithmic and exponential functions with appropriate curve fitting (least squares) and trigonometry. Applications include chemical mixtures, rinsing problems, liquid/air flow calculations, container volumes, calibration curves, spill volumes, spill dispersion, radioactive decay, geometric mean, transit/clinometer calculations and scaling drawings/maps.

**MATH 1841 Technical Mathematics for Pros/Orthot** — Emphasizes the integration of problem-solving strategies with mathematical and calculator skills in the context of relevant health applications. Topics include: formula manipulation, unit conversion, ratio/proportion, percentage (ppm, ppb), area/volume calculations, linear, logarithmic and exponential functions, systems of linear equations, vectors, and trigonometry. Applications include chemical mixtures, center of gravity, radioactive decay, muscle tension/extension, composite effect of forces applied to the body.

**MATH 1861 Statistics for Cardiology** — Teaches students how to organize and summarize data, and how to make conclusions about a large body of data by examining only a small part of the data. Topics include: descriptive statistics (e.g., describing the usual range of blood pressure); elementary probability, with application to disease incidence rates; and statistical estimation/hypothesis testing, with application to the accuracy of diagnostic tests and the evaluation of drug trial results. Prerequisite: Math 12 C+.

**MATH 1881 Technical Mathematics for OCHS** — Emphasizes the integration of problem-solving strategies with mathematical and calculator skills in the context of relevant occupational health and safety applications. Topics include unit conversion (metric and imperial, ppm, ppb), ratio/proportion, area/volume calculations, linear, logarithmic and exponential functions with appropriate curve fitting (least squares), vectors and trigonometry. Applications include chemical mixtures, rinsing problems, fluid/air flow, container volumes, noise relationships, force diagrams, radioactive decay, scaling drawings. Prerequisite: Math 12.

**MATH 2342 Calculus for Robotics** — Covers the derivative, differentiation rules, applied maxima/minima and implicit differentiation. Antidifferentiation, the indefinite and the definite integral including area, mean value and RMS value. Differentiation and integration of trigonometric, logarithmic and exponential functions. Infinite series. Fourier series, evaluation of Fourier coefficients and line spectrum. Applications to DC and AC circuits and waveform analysis. Prerequisite: MATH 1342.

**MATH 2401 Analytic Geometry and Calculus for Building** — Covers analytic geometry with application to building and architecture. Differentiation and relevant applications (applied maxima/minima, related rates and differentials). Indefinite integral, definite integral, fundamental theorem of calculus, and applications (areas, means, volumes, arc length, centroids, moment of inertia, work, etc.). Prerequisite: MATH 1401.

**MATH 2411 Calculus for Chemical Sciences** — Covers differential calculus with emphasis on rates of change in problems concerning the chemical sciences. Applied maximum and minimum problems. Indefinite integrals. The definite integral as a tool to find area under a curve and volumes of solids of rotation. Prerequisite: MATH 1411.

**MATH 2412 Statistics for Chemical Sciences** — Covers organization and graphical presentation of data, frequency distribution, measures of central tendency, concepts of probability, discrete and continuous variables and their probability distributions, normal approximation to the binomial distribution. An introduction to quality control. The course uses examples taken from actual chemical data. Prerequisite: MATH 1411.

**MATH 2421 Calculus for Civil and 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, volumes, centroids, moments of inertia, deflection of beams, fluid pressure. Prerequisite: MATH 1421.

**MATH 2431 Calculus for Electronics** — Covers implicit differentiation, related rates and approximation using differentials with application to electronic technology. Antidifferentiation, the indefinite and definite integral including evaluation of areas, average 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 2441 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 probability 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.

**MATH 2453 Statistics for Renewable Resources** — Presents an introductory level course in statistics. Includes descriptive statistics, measures of central tendency, variation and skewness; probability laws and distributions; inferences from one and two samples; correlation and regression, estimation of sample size, and hypothesis tests from large and small samples. Estimation of parameters from various sampling designs is presented. These methods are applied to examples chosen from the RENR field. Prerequisite: MATH 1451.

**MATH 2461 Statistics and Quality Control for Wood Product Manufacturing** — Covers descriptive statistics. Probability theory. Discrete and continuous variables and their distributions. Sampling. Point and interval estimates of the population mean. Hypothesis testing. The analysis of paired data. Regression and correlation. Quality control. All concepts are supported by examples from wood products manufacturing and research papers from the industry are discussed. Prerequisite: MATH 1461.

**MATH 2471 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. Industrial applications. Prerequisite: MATH 1471.

**MATH 2491 Calculus for Mechanical** — Continues of the differential and integral calculus that was presented in MATH 1491. Topics include: transcendental functions, curve sketching, maxima and minima, areas and volumes, centroids and moments of inertia, calculation of work and force due to fluid pressure, partial derivatives and multiple integrals, and ordinary differential equations. Computer software (e.g. Maple V) will be used for problem-solving and function visualization. There will be a strong emphasis on illustration the mathematics with applications from technology, engineering, and the physical sciences. Prerequisite: MATH 1491.

**MATH 2501 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 applied to area, volume, centroid and other applications. Tables of integrals. Industrial Applications. Prerequisite: MATH 1501.

**MATH 2511 Calculus for Geomatics** — Covers differentiation rules for algebraic, trigonometric, inverse trigonometric, logarithmic and exponential functions; related rates, differentials and approximations used in surveying, radius of curvature; selected integration, arc length, the spiral curve; Taylor and Maclaurin series; 3D analytic geometry, partial differentiation with applications in geomatics. Prerequisite: MATH 1511.

**MATH 2751 Statistics for Nuclear Medicine** — Emphasizes statistical data treatment and decision-making with illustrative nuclear medicine/health applications. Topics include modeling with probability distributions (Binomial, Poisson, Normal), Bayes' Rule, statistical inference (estimation and hypothesis testing, p-values), regression and correlation. Applications include descriptive presentations, statistical quality control measures in laboratory work (CV, Accuracy, Chi-squared test on Scintillation Spectrometer), Predictive-Value Positive of Tests, using radioactive counts in estimation/testing, and confidence banding. Prerequisite: MATH 1751.

**MATH 2782 Calculus for Biomedical Engineering** — Covers rules of differentiation, rates of change, related rates, differentials, implicit differentiation with application to electrical and mechanical problems. Definite and indefinite integral, calculation of mean and RMS values for various electrical waveforms. Integration techniques. Fourier Series. First and second order linear differential equations with constant coefficients applied to electrical circuits. Prerequisite: MATH 1781.

**MATH 2792 Computer Applications and Statistics for Electroneurophysiology** — Covers descriptive statistics, basic probability concepts and probability distributions including the binomial, Poisson and normal distributions. Sampling and sampling distributions, point and interval estimates for mean and proportion (large and small samples). Hypothesis testing. Linear regression and correlation. Introduction to Microsoft Excel. Fourier Series and line spectrum. Prerequisite: MATH 1791.

**MATH 2841 Statistics for Prosthetics and Orthotics** — Covers descriptive statistics, probability theory, the normal distribution. All concepts are supported with examples concerning relevant health statistics. Prerequisite: MATH 1841.

**MATH 2881 Statistics for Occupational Health and Safety** — Covers presentation of data in tabular and graphical form. Frequency distribution, measures of central tendency and variation. Probability, discrete and continuous data. Binomial and Normal probability distributions. Sampling, confidence limits, and hypothesis testing. Regression, correlation, and chi-square test. Applications to data and problems relevant to Occupational Health Technology. Prerequisite: MATH 1881.

**MATH 3342 Transform Calculus (Robotics)** — Covers first and second order differential equations. Step and impulse functions. Laplace transforms and inverse transforms. Solutions of differential equations by transforms. Z-transforms of discrete signals and inverse Z-transforms. Applications to electrical circuits, signal processing, analysis of circuits and systems. Prerequisite: MATH 2342.

**MATH 3411 Numerical Methods for Chemical Sciences** — Uses computer software (Maple and/or Excel) to solve relevant chemical sciences applications using optimization (simplex), curve fitting, systems of linear equations, algebraic and transcendental equations, numerical integration, and statistical data analysis. Prerequisite: MATH 2411.

**MATH 3421 Applied Linear Algebra and Calculus** — Covers analysis of structures and stability using linear algebra; applications of linear algebra to mechanics; introduction to optimization; calculating moments, centroids, fluid pressure; and solving distributed load problems. Prerequisite: MATH 2421.

**MATH 3431 Transform Calculus for Electronics** — Covers step and impulse functions. Laplace transforms of functions and mathematical operations. Partial fractions. Inverse Laplace transforms. Solutions of differential equations. Systems and stability. Solutions of applied problems appropriate to the electronics technology. Prerequisite: MATH 2431.

**MATH 3441 Microcomputer Applications for Food Technology** — Covers advanced methods of statistical analysis relevant to Food Technology, including ANOVA, linear and multiple regression, factorial analysis and aspects of experimental design via simple projects and exercises implemented in an Excel 5.0 workbook. Prerequisite: MATH 2441.

**MATH 3471 Differential Equations for Petroleum** — Covers elementary differential equations and separation of variables. First and second-order equations with constant coefficients. Steady-state and transient solutions. Solution by numerical methods. Applications to fluid flow, mixing and dilution, heat conduction, heating and cooling, deflection of beams and pipes, free and damped oscillating systems. Prerequisite: MATH 2471.

**MATH 3491 Numerical Methods for Mechanical** — Covers numerical integration and solution of differential equations with application to shear and bending moments; numerical differentiation with application to signal processing; solution of non-linear equations applied to geometric problems; the use of linear programming software (e.g., job allocation and scheduling problems); matrix methods applied to computer graphics. Use of spreadsheets to solve practical problems. Prerequisite: MATH 2491.

**MATH 3492 Statistics** — Introduces students to the concepts of probability modelling (systems reliability) estimation methods, statistical tests of significance and linear correlation and regression effects (energy analysis) in an applied setting. Students will prepare data presentations using the statistical tools in Microsoft Excel. Prerequisite: MATH 1491.

**MATH 3501 Numerical Methods and Computing for Mining** — Covers solution of problems related to the Mining Technology using Microsoft QuickBasic. Introduction to critical path scheduling and allocation of resources. Use of computers to solve problems in calculus. Calculus of multivariate functions. Prerequisite: MATH 2501.

**MATH 3511 Matrix Methods for Geomatics** — Covers matrix algebra and its use in least squares adjustments. Matrix calculus with Taylor Series linearization, eigenvalues and eigenvectors, quadratic forms and error ellipses. Prerequisite: MATH 2511.

**MATH 3782 Statistics for Biomedical Engineering** — Covers descriptive statistics. Estimation, central limit theorem, standard errors, confidence intervals, hypothesis testing, the t-distribution. Linear regression and correlation. Empirical curve fitting. Introduction to quality control. Computer packages will be discussed. Prerequisite: MATH 2782.

**MATH 442I Statistics for Civil and Structural** — Covers 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 242I.

**MATH 447I Statistics and Numerical Methods for Petroleum** — Covers 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 probability distributions with an introduction to Quality Control techniques. Sampling, estimation and hypothesis testing with both large and small samples. Regression, correlation, confidence bands. Linear programming. Prerequisite: MATH 147I.

**MATH 449I Statistical Quality Control** — Covers descriptive statistics, the Hypergeometric, Poisson, Binomial and Normal probability models; an introduction to hypothesis testing, tolerances and fits; sampling distributions, capability analysis (CP, CPK, CR) and design of acceptance sampling plans, use of Mil-Std 105E, risks in sampling, statistical process control (SPC), use and interpretation of control charting for  $\bar{x}$ -bar and R or S, percent defective (p-charts), number of defects (c-charts), short run SPC including charts for individuals, target charts and charting part families. MATH 449I 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 149I.

**MATH 450I Numerical Methods/Statistics** — Covers linear programming using the Simplex and other methods applied to coal blending and optimum assignment. Descriptive statistics, probability distributions (Binomial, Poisson, Normal), estimation, confidence intervals, regression and correlation. Geostatistics with semi-variograms, average grade of ore above cut-off, estimation of ore grade and kriging. An important component of this course is computer work with standard spreadsheet and geostatistical software. Prerequisite: MATH 350I.

**MATH 451I Statistics for Geomatics** — Covers data organization, estimation, hypothesis testing, propagation of measurement error, error ellipses and bivariate normally distributed data as used in least squares adjustments. Prerequisite: MATH 351I.

**MATH 460I Mathematics for CAD/CAM** — Covers mathematics relevant to CAD/CAM systems: Parametric representation of curves in space including Bezier curves and cubic splines. Matrix approach to spatial transformations including translation, scaling, rotation, reflection and shearing. Viewing transformations including orthogonal, isometric, perspective and stereoscopic. The synthetic camera. The Turbo C/C++ graphics library. Image rendering including hidden line removal algorithms, edge and face visibility tests, lighting and shading models. Overview of constructive solid geometry. Animation basics. Prerequisite: MATH 249I.

**MATH 594I Basic Technical Mathematics 1 for TTED** — Covers skills necessary for teaching mechanical, electronics and technology courses at the secondary level.

**MATH 594I Basic Technical Mathematics 2 for TTED** — Continues from MATH 594I. Topics include ratio and proportion; linear, quadratic, power and exponential equations and functions, system of equations; problem-solving, trigonometry and trigonometric functions, binary and hexadecimal number systems.

## MECHANICAL

**MECH 1100 Engineering Graphics I** — Engineering graphics is the means by which technologist communicate technical ideas and engineering designs and is the primary means of communication in the design and manufacturing process. Technologists must be able to visualize and interpret technical drawings as well as produce technical sketches. For effective graphical communications, there are standards and conventions that must be followed.

**MECH 1104 Computer Aided Design** — Covers techniques for producing and reading mechanical drawings using industry standards and the development of drawing skills using computer aided techniques. Topics include orthographic projection, auxiliary views, dimensioning and the hierarchy of drawings. Introduces the computer hardware and operating systems necessary in a computer aided design environment.

**MECH 1105 CAD Graphics** — Computer Aided Design (CAD) software and related computer hardware is used to create precise, technical drawings for design and manufacturing. Technologists must be able to use CAD tools to effectively and efficiently produce technical drawings that adhere to industry standards and CAD practices.

**MECH 114I Engineering Mechanics I** — Engineering mechanics is the technical foundation for areas such as machine design, stress analysis, hydraulics, and structural design. The study of forces on and in structures and machine components that are at rest or moving at a constant velocity is known as statics. For rigid bodies in static equilibrium, the internal and external forces can be determined.

**MECH 117I Computer Applications and Programming** — The use of computers is integral to all disciplines for engineering technologies. Technologists must be able to use computers to communicate, solve problems, and analyze data using commercial application software and operating systems. Where software solutions do not exist, technologists need to be able to create or modify application programs.

**MECH 1220 Energy Systems** — Many mechanical machines and devices such as pumps, compressors, engines, heaters and coolers deal with energy transfer and fluid flow. Mechanical technologists are particularly involved with the conversion of energy from one form to another and the use of fluids (gas or liquid).

**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 1800** — 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.



**MECH 1801 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.

**MECH 1900 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.

**MECH 1910 Manufacturing Processes** — Covers the basics of mechanical and electronic manufacturing methods. Topics include metal cutting, welding, forming, casting plastics, electronic fabrication and assembly, as well as methods of measurement and inspection.

**MECH 2201 Engineering Graphics 2** — The modern design and manufacturing process involves an integrated team approach called concurrent engineering. For engineers and technologists to work in teams, drawing conventions are followed to facilitate the technical communication process by allowing data sharing amongst the team members. CAD systems are used to produce 2D and 3D models for visualization, analysis, and for the production and distribution of the technical documentation of the design process. Prerequisites: MECH 1100, MECH 1105.

**MECH 2204 Technical Graphics for Plastics** — The modern design and manufacturing process involves a team approach to solving production problems. The engineering language is based upon drawing conventions and is used to facilitate this process. CAD (Computer Aided Design) systems aid in the process of technical documentation and communication.

**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 2240 Strength of Materials** — Structures and machine components should not fail as a result of the application of loads. Failure can occur as a complete fracture, excessive deformation, or become unstable and buckle. It is the technologists task to calculate load limits, specify materials and size components using the principles of strength of materials.

**MECH 2241 Engineering Mechanics 2** — Looks at another aspect of engineering mechanics: the consideration of bodies in motion, dynamics. Dynamics consists of kinematics that is the analysis of the geometry of motion and the associated forces. For mechanical applications, the forces associated with motion are often very critical to the design process.

**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 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 3306 Radiographic Procedures 3** — Covers positioning techniques in combination with appropriate technical factors and imaging theory required to produce diagnostic skull radiographs. Students will learn how to evaluate the diagnostic acceptability of skull radiographs. Lab will reinforce theoretical components of the course. Prerequisites: MRAD 2206, MECH 1120.

**MECH 3320 Thermal Engineering 1** — Covers the first and second law of thermodynamics. Steady and non-flow energy equations, specific heats of gases, vapor tables, gas and vapor processes. Carnot, Rankine and basic IC engine cycles. Air compressors. Heat transfer. Prerequisite: MECH 1120.

**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 1141.

**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 analysis, design of, welded and threaded connections and shaft sizing. Problems are handled in both SI and Imperial units. Prerequisites: MECH 2240 and MECH 2241.

**MECH 3345 Computer Aided Engineering (CAE)** — Covers Computer-Aided Engineering (CAE) analysis techniques such as 3D solid modeling, surface modeling 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. Prerequisite: MECH 2240.

**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 3451 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 3452 Fluid Power 3** — Continues from MECH 3451. Prerequisite: MECH 3451.

**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 analyse comparative costs and to understand the time value of money (interest), inflation, depreciation, running costs, salvage value and tax considerations.

**MECH 4421 Thermal Engineering 2 —**

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. Prerequisite: MECH 3320.

**MECH 4440 Machine Design 2 —**

Continues from MECH 3340, covering gears, couplings, brakes and clutches; anti-friction and journal bearings; 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 4491 Design Projects —** Provides students the opportunity to develop 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. Prerequisite: MECH 3340.

**MEDICAL IMAGING****MIMG 7000 (ADMI 6112) Technological Advances in X-Ray Imaging —**

Provides technology update of radiographic, fluoroscopic, and digital X-ray imaging systems. Topics include: a history of diagnostic radiology; evaluation of current state-of-the-art X-ray tube and generator technology; X-ray absorptiometry systems; and, a description of quality improvement methodologies. Additionally, current developments in digital X-ray imaging systems such as computers and information technology; computed radiography; digital fluoroscopy; digital mammography; computed tomography; film digitizers and laser imagers; picture archiving; communication systems (PACS); and, teleradiology will be explored. This course includes a major project.

**MIMG 7001 (ADMI 6114) Understanding Radiation Risks —**

Examines various topics in radiation: physics, radiobiology, dose, radiation protection criteria and standards, dose response models, pregnancy and radiation, risks in medical imaging, and risk reduction technology. Focuses on issues related to X-ray, ultrasound and magnetic resonance imaging. Includes a discussion of public health aspects of radiation. 3 credits

**MIMG 7002 (ADMI 6117) Medical Radiation Protection —**

Addresses, through readings and assignments, general radiation protection considerations, sources of radiation exposure, objectives of radiation protection and public health agencies, units used in radiation protection, radiation detectors, survey instruments and personnel monitors, bio-effects, dose limits, and practical means of radiation protection. In addition, other topics such as protection principles governing diagnostic examinations, shielding from external radiation, radiation dose estimates, radiation dose and quality control and protection in Magnetic Resonance Imaging will be discussed. The course concludes with a discussion of radiation protection issues of the 1990's. 3 credits

**MIMG 7003 (ADMI 6119) Digital Imaging**

— Provides a broad theoretical framework for understanding the principles and concepts relating to digital radiology imaging systems. First, the fundamentals of digital image processing are presented followed by a description of the technologies of major radiological image acquisition systems, archiving, communication, retrieval, display and processing. The course concludes with an overview of issues concerning a total digital radiology department. Prerequisite: Registered Technologist in Diagnostic Radiology. 3 credits

**MIMG 7004 (ADMI 6337) Advanced Topics in Patient Care —**

Provides a solid theory base for the delivery of safe patient care in potentially unstable or unpredictable situations. A review of basic IV, oxygen, and suctioning theory precedes content on initiating an intravenous infusion, total parenteral nutrition, and pulse oximetry and ECG monitoring. A large section covers the purpose and significance of a variety of tubes, lines and specialized equipment. Common emergencies and pharmaceuticals specific to the Medical Imaging Department are included as is an overview of pediatric growth and development. Prerequisite: Graduate medical radiation technologists in radiography or nuclear medicine or sonography. 3 credits

**MIMG 7005 (ADHS 5130) Ethics in Health Sciences —**

Provides the practising health care professional with an introduction to the study of ethics in health sciences. It will not provide answers to specific ethical dilemmas but will help the student to acquire the tools needed for ethical deliberation and action. 2 credits

**MIMG 7006 (ADHS 5120) Understanding Research in Health Sciences —**

Introduces students to the nature of scientific research through coverage of a number of topics. These include: the major steps in the research process; research terminology; methodologies for both quantitative and quality research; research problems/questions/hypotheses; literature review; research designs and ethical considerations in conducting research. In addition, students will explore data collection techniques and analysis; communicating and reporting results. 3 credits

**MIMG 7007 (ADMI 6222) Image Quality in Diagnostic Radiology** — Deals with three major components of image quality, namely, contrast, spatial resolution and noise. The physics and technology of both film-screen and digital imaging systems will be studied followed by a detailed examination of the physical characteristics of contrast, spatial resolution and noise in diagnostic radiology. In addition, various approaches to the measurement of image quality, as well as the perception of visual information will be considered. Included will be an exploration of selected research studies on image quality. 4 credits.

**MIMG 7100 (ADMI 6330) Imaging the Digestive System** — Focuses on all aspects of digestive system. Imaging including the anatomy and physiology of the digestive organs, accessory organs, blood and nerve supply and digestive processes, digestive system pathologies, procedures in gastrointestinal radiology including pediatric GI radiography. Consideration of digital fluoroscopy is included together with the radiation protection aspects relative to imaging of the digestive system. 3 credits

**MIMG 7101 (ADMI 6336) Advances in Special Procedures** — Designed for technologists who desire a formal study of special procedures. The fundamentals of angiography are covered including the procedures, suite and patient considerations. Vascular anatomy is reviewed using DSA Images. DSA equipment and procedures are studied, including: cardiac angiography, angioplasty, embolization, nephrostomy, biliary drainage and other interventional radiology examinations. The content is aimed at improving clinical performance in a special procedure. 3 credits

**MIMG 7200 (ADMI 6115) Magnetic Resonance Imaging 1: Physical Principles and Instrumentation** — Examines the physical principles of MRI - basic physics of NMR and the equipment needed to produce magnetic resonance images. Digital Imaging concepts related to MRI will be introduced. The bioeffects and hazards of magnetic fields and radio frequency radiation, and guidelines for safe use of MRI will be discussed. 3 credits

**MIMG 7201 (ADMI 6116) Magnetic Resonance Imaging 2: Image Production and Tissue Characterization** — Deals with a detailed examination of how Magnetic Resonance Images are produced through a discussion of Pulse Sequences and Gradient Coils as well as Fast Imaging Techniques. In addition, factors which constitute the MR Image (tissue characterization), quality assurance, artifacts and an introduction to MRI anatomy of the central nervous system, thorax, abdomen, pelvis and extremities. Prerequisite: MIMG 7200. 3 credits

**MIMG 7202 (ADMI 6120) Imaging Techniques Q.C. and Artifacts** — Deals with Magnetic Resonance Imaging signal generation, detection and localization mechanism and will elaborate on the more commonplace imaging methods used to produce MRI Images. A selection of the latest fast Imaging pulse sequences will be described along with quality assurance and quality control tests performed on MRI equipment. Finally, several MRI artifacts will be identified and discussed with respect to the patient and the technology. Mechanisms to minimize of eliminate recognized artifacts are described. Prerequisites: MIMG 7200 and MIMG 7201. 3 credits

**MIMG 7300 (ADMI 6111) Computed Tomography** — Physical principles and instrumentation provides a broad theoretical framework for understanding the principles of Computed Tomography (CT). Lays the basic foundations for practical aspects of CT scanning. 3 credits

**MIMG 7301 (ADMI 6339) Computed Tomography** — Clinical Applications. Covers the practical aspects of CT scanning such as patient positioning, care and handling, as well as scanning protocols for the head, neck, chest, abdomen, pelvis and extremities are emphasized through lectures and clinical practice. Finally, practical aspects of the equipment and clinical applications of CT are emphasized. Prerequisites: MIMG 7300. 3 credits

**MIMG 7400 Breast Imaging 1/Principles and Instrumentation** — Begins by tracing the evolution of film-screen mammography and describe the physics and technology of breast imaging, including digital mammography. In addition, radiation dose and risk considerations; radiation protection; quality assurance/quality control; and, the Mammography Quality Standards Act will be discussed. Finally, the course concludes with an examination of current technical research activities in breast imaging including other techniques such as ultrasound, magnetic resonance imaging, digital tomosyntheses, laser computed tomography imaging, and nuclear medicine. Prerequisite: BCIT Medical Radiography Diploma or equivalent. 3 credits

**MIMG 7401 Breast Imaging 2/Clinical Applications** — Explores topics related to clinical breast imaging. Topics include anatomy and physiology of the breast; patient care and communication; patient positioning, technique and film evaluation; clinical assessment; and breast pathology. Prerequisite: MIMG 7400. 1 credit

**MIMG 8200 (ADMI 6118) MRI Practicum** — Designed as a 12-week clinical practicum at a hospital and/or clinical, where the student will perform and document selected MRI examinations and MRI QC tests under the direct supervision of the supervisor/senior technologist responsible for the MRI department/scanner. In addition, the student will demonstrate competent operation of the MRI scanner and its peripheral equipment. 18 credits

## MINING

**MINE 1101 Introductory Geology** — Presents a systematic introduction to the materials, processes and origins of the major classes of igneous, sedimentary and metamorphic rock. 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 Mining Exploration** — Discusses the roles of participants, the sources of funding, the objectives, and the strategies employed in mining exploration. The course describes various techniques, (including lithochemistry, geochemistry, geophysics, diamond drilling, and prospecting) and the details of their application.

**MINE 1103 Introduction to Computers** — Provides a practical understanding of MS-DOS that 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 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 2099 Mining Industry Experience** — Designed as an optional course. Mining Technology students are eligible to apply for the Mining Industry Experience course in the first two weeks of September in Level 1. The program runs from May 1 to August 31 between Levels 2 and 3, and it consists of fully salaried work at a mining operation with an exploration crew. It has been developed in collaboration with the mining industry of B.C. and the Mining Association of British Columbia to provide field experience that complements classroom studies. Following successful completion, a Certificate is awarded by the mining industry to participants going on to graduate from the Mining program.

**MINE 2101 Geomorphology** — Uses a raw material, process-product approach 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 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, labor and supplies. Prerequisite: MINE 1102.

**MINE 2108 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 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 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 Mineral Deposits** — Defines the information required to explain a mineral deposit and examines the extent to which such information exists. 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 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.

**MINE 4360 Environmental Applications** — Continues from CHSC 3360. Topics include the review process, the application to perform work, the base line study, the impact statement, and the permit; positions of the stakeholders groups; impacts to surface topography, flora, fauna, wetlands, groundwater, surface drainage, and erosion; and, reclamation and long-term monitoring.

## MARKETING

**MKTG 1102 Essentials of Marketing** — Provides 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 1113 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.

**MKTG 1114 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.

**MKTG 1116 Entrepreneurial Management** — Investigates all factors involved in starting a new business enterprise. Topics include market analysis, developing a market, and financial and operations strategy. Legal implications are covered. Students will develop a comprehensive business plan for a new venture.

**MKTG 1980 Marketing Management** — Provides you with an overview of marketing and an understanding of how it can be applied to any type of organization. The materials covered include the scope and nature of marketing, the elements of marketing, market characteristics, basic marketing research techniques, market segmentation and target market selection.

**MKTG 2202 Introduction to Marketing Communications** — 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 Sales Skills** — Designed to cover the mechanics of salesmanship and the salesperson's role in the firm. Prerequisite: MKTG 1102.

**MKTG 2309 Marketing Research I** — 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 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 2334 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.

**MKTG 3301 Computer Applications in Marketing** — Examines decision support systems utilizing mathematical modelling methods, data bank access, and computer-based information. Prerequisite: COMP 2104.

**MKTG 3305 International Marketing** — Examines import/export procedures, particularly in relation to sophisticated technology products and services. Trading patterns and forecasts are thoroughly covered. Prerequisite: MKTG 1102.

**MKTG 3306 Principles of Small Business** — Examines the planning stages involved in starting a new business including market, financial and legal feasibility requirements. Prerequisite: MKTG 1102.

**MKTG 3311 Real Estate Principles I** — 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, salesperson 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.

**MKTG 3312 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. Prerequisites: ECON 2100, ECON 2200.

**MKTG 3313 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: None.

**MKTG 3317 Sales Promotion Management** — Presents a study of promotional support activities used as part of an integrated marketing communications plan. Loyalty programs, couponing, specialty advertising, premiums and incentive programs are examples of the sales promotion tactics covered. Emphasis is on when and how to use them. Prerequisite: MKTG 2202.

**MKTG 3333 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 development of real estate marketing programs and strategies. Prerequisite: MKTG 1102.

**MKTG 3334 Advanced Sales and Negotiation** — 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. Students will be exposed to the use of industry standard tools and techniques. Prerequisite: MKTG 2243 or MKTG 1219.

**MKTG 3338 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: MKTG 1102.

**MKTG 3339 Public Relations and Event Marketing** — Presents a study of planning and executing public relations campaigns including communication's techniques, media relations, special events, trade and consumer shows, exhibitions and lobbying. The course focuses on both external and internal publics, tactical planning to meet realistic budget constraints and budget development. Students experience hands-on, practical application of the basic public relations tactics. Emphasis is placed on developing campaigns as part of an integrated marketing communications plan. Prerequisite: MKTG 2202.

**MKTG 3343 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. Prerequisites: MKTG 1102, MKTG 2243.

**MKTG 3409 Marketing Research 2** — Examines the basic approaches to marketing research. The course discusses 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 or MKTG 2341.

**MKTG 3417 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: MKTG 2202.

**MKTG 4318 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. Prerequisites: MKTG 3317, MKTG 3339, MKTG 3417.

**MKTG 4330 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: MKTG 1102.

**MKTG 4401 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 1102.

**MKTG 4402 Relationships Selling** — Covers professional selling skills utilizing buyer behavior, product knowledge, time management and sales call planning tools. Computer applications in sales are also covered. Prerequisite: MKTG 3334, MKTG 2243 or MKTG 1219.

**MKTG 4403 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: All Level 3 courses (this is a capstone course).

**MKTG 4405 International Market Planning** — Examines how to develop a formal international marketing plan including situation analysis, market and competitive conditions, transportation logistics, exchange rate fluctuations, research, objective setting and scheduling using computer-based managements systems.

**MKTG 4407 Case Studies/Entrepreneurship** — Analyzes both successful and unsuccessful ventures to reveal the role of the entrepreneur. Prerequisite: MKTG 3306 or MKTG 1324.

**MKTG 4408 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 Real Estate Principles 2** — Allows a graduate to challenge the Real Estate Salesperson's and Sub-mortgage Brokers pre-licensing exam. Prerequisite: MKTG 3311.

**MKTG 4412 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: None.

**MKTG 4413 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: MKTG 3311.

**MKTG 4415 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 practise “pitching” the account in competition with other teams. Prerequisites: MKTG 3317, MKTG 3339, MKTG 3417.

**MKTG 4416 Marketing Communications Internship** — Provides students with an assigned work experience position in a wide spectrum of industry sectors. On-the-job performance is fully evaluated. Prerequisite: All Level 3 and 4A courses (this is a capstone course).

**MKTG 4418 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: All Level 3 courses (this is a capstone course).

**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. Prerequisite: MKTG 3301.

**MKTG 4430 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: MKTG 1102.

**MKTG 1420 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.

## MEDICAL RADIOGRAPHY

**MRAD 1102 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 1104 Radiographic Anatomy and Physiology 1** — Presents a detailed study of the human skeleton. The body organs, glands, vessels and nerves are studied according to region. Throughout the course, emphasis is on surface anatomy, the radiographic appearance of structures, and the details of structure and function that are pertinent to radiographic procedures.

**MRAD 1105 Master Student Program** — Under development.

**MRAD 1106 Radiographic Procedures 1** — Presented with two components: I) introductory course to the field of radiography as it applies to basic principles and terminology. Emphasis will be placed on patient prep, care and positioning for upper and lower extremities, spine, pelvis, chest and abdomen; and, II) film imaging evaluation and structure identification of pertinent structures. The student will become familiar with factors affecting radiographic quality and develop the ability to adjust technical factors optimum quality radiographic.

**MRAD 1107 Clinical Orientation** — Introduces basic clinical skills and theory required for MRAD 1108: Clinical Education 1. This course includes preparation of contrast media, radiation protection, medical terminology, emergency procedures, professional ethics and practise, and medical legal aspects of the clinical environment in the B.C. Health Care System.

**MRAD 1108 Clinical Education 1** — Orients students to the clinical area and provides them with an opportunity to 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 2200 Clinical Education 2** — Provides students with practical experience in the following areas: upper and lower extremity (trauma patient), non-ambulatory chest with IV or drainage, non-traumatic vertebra, routine fluoroscopy and routine IVPs.

**MRAD 2204 Radiographic Anatomy and Physiology 2** — Continues on from MRAD 1104. Presents a detailed study of the human skeleton. The body organs, glands, vessels and nerves are studied according to region. Throughout the course, emphasis is on surface anatomy, the radiographic appearance of structures, and the details of structure and function that are pertinent to radiographic procedures. Prerequisites: MRAD 1104, BHSC 1113.

**MRAD 2205 Case Studies 1** — 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 2206 Radiographic Procedures 2** — Covers positioning for radiographic procedures related to the urinary, digestive, biliary systems as well as limited spine, thoracic cage and pelvic girdle radiography. Also, the skills required to evaluate the diagnostic and technical acceptability of the radiographs technique charts for various exams and for the variations of the normal patient will be developed. Prerequisite: MRAD 1106.

**MRAD 2207 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 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 3300 Clinical Education 3** — Provides students with practical experience in the following areas: upper and lower extremity (trauma patient), non-ambulatory chest with IV or drainage, non-traumatic vertebra, routine fluoroscopy and routine IVPs. Prerequisite: MRAD 2200.

**MRAD 3304 Radiographic Anatomy and Physiology 3** — Continues on from MRAD 2204. Presents a detailed study of the human skeleton. The body organs, glands, vessels and nerves are studied according to region. Throughout the course, emphasis is on surface anatomy, the radiographic appearance of structures, and the details of structure and function that are pertinent to radiographic procedures. Prerequisites: BHSC 2213, MRAD 2204.

**MRAD 3305 Case Studies 2** — Continues on from MRAD 2205. 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. Prerequisite: MRAD 2205.

**MRAD 3306 Radiographic Procedures 3** — Course instruction will cover positioning techniques in combination with appropriate technical factors and imaging theory required to produce diagnostic skull radiographs. Students will also learn how to evaluate the diagnostic acceptability of skull radiographs. Lab will reinforce theoretical components of the course. Prerequisite: MRAD 2206.

**MRAD 3307 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 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 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 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 Clinical Education 4**

— 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. Prerequisite: MRAD 3300.

**MRAD 5500 Clinical Education 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. Prerequisite: MRAD 4400.

**MECHANICAL SYSTEMS****MSYS 2380 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. Prerequisite: CHSC 2205.

**MSYS 3382 HVAC Load Analysis**

— Establishes analytical backgrounds for calculating heating, cooling and ventilation loads required in occupied structures. Topics include the use of climatic data, comfort condition criteria, methods of determining heat gains/losses, solar gains/losses of computer aided and psychrometric process load analysis. Prerequisite: MECH 1220.

**MSYS 3386 Heating Systems**

— Examines air and hydronic heating systems, their components and controls for institutional, commercial and residential buildings. Included are discussions relating to fuels, energy sources and combustion requirements, design requirements and procedures are applied to preselected building assignments. Prerequisite: MECH 1220.

**MSYS 3389 Plumbing Systems**

— Examines the 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. Prerequisite: MECH 1220.

**MSYS 3860 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.

**MSYS 3880 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 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.

**MSYS 4410 Mechanical Systems Seminars**

— Addresses, through plant tours, guest lecturers, demonstrations, seminars and site assignment investigations, fields of applications, operating principles of various systems and specialty items associated with mechanical systems. Prerequisites: MSYS 2380/3382/3386/3389, MECH 3320/3325, ELEX 2845.

**MSYS 4450 Instrumentation and Controls**

— Designed to assist students understanding of automatic control systems and how they are applied in HVAC industry. Also included are principles of operation and applications of various types of instrumentation for temperature, pressure, fluid viscosity, and flow rate measurement and controls. Prerequisite: ELEX 2845.

**MSYS 4470 Project Management**

— Develops the application of project management techniques in the Mechanical Systems field to address the project constraints of required results, budget and timelines. The principles of definition and control used in coordinating the jobsite are introduced through the integration of relevant administrative, architectural and engineering practices. Problem-solving strategies will be applied to a typical mechanical systems project to prepare a schedule using current project management software. Prerequisites: MSYS 2380/3386/3389.



**MSYS 4480 Air Conditioning Systems —**

Covers mechanical systems design practices for residential and commercial structures including fan selection, duct construction and sizing, air terminal devices, noise and vibration analysis. 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. Prerequisites: MSYS 3382/3386, MECH 3320/3325.

**MSYS 4486 Energy Management —**

Covers planning and implementation of auditing programs for institutional, commercial and industrial facilities. Topics include energy rate structures, utility metering and billing, data logging, energy-auditing, and system analysis techniques. Prerequisites: MSYS 3382, MSYS 3386.

**MSYS 4488 Fire Protection Systems —**

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.

**MSYS 4490 Systems Projects —** Allows each student or student team to select a project from a folio of problems local industry has encountered. Students work in conjunction with industry and faculty advisors to develop teamwork and engineering competency skills. Prerequisites/Corequisites: COMM 2449, MECH 3440/3460, MSYS 4470/4480/4486/4488 (must have completed or be in the process of completing all of the previous level before registering in this course).

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**NUCLEAR MEDICINE**

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**NMED 1020 Radiopharmaceuticals I —**

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 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. In addition, medical terminology is studied comprehensively.

**NMED 1116 Nuclear Medicine Laboratory Skills —**

Provides the base theories and principles of operation, use, and care of equipment and instruments found in a nuclear medicine laboratory. In addition, laboratory safety and WHMIS regulations are emphasized. Blood handling and procurement are introduced.

**NMED 2025 Radiopharmaceuticals 2 —**

Discusses the clinical application of specific radiopharmaceuticals on a systematic basis. Pertinent aspects of pharmacology and antigen antibody reactions applicable to nuclear medicine are also dealt with. Prerequisite: NMED 1020.

**NMED 2040 Applied Physiology I —**

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 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 Clinical Experience I —**

Provides a clinical practicum 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 Image Display —**

Designed to familiarize Nuclear Medicine Technology students with 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 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 Clinical Experience 2 —**

See NMED 2090. Prerequisite: NMED 2090.

**NMED 4040 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 Clinical Experience 3 —**

See NMED 2090. Prerequisite: NMED 3080.

**NMED 4090 Clinical Experience 4 —**

See NMED 2090. Prerequisite: NMED 4080.

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**SPECIALTY NURSING/  
CRITICAL CARE**

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**NSCC 7100 Introduction to Critical Care Nursing —**

Introduces participants to the critical care nursing specialty and the role of the critical care nurse. Participants will examine the concept of health and their understanding of health as it relates to critical care nursing. By talking with a person who has experienced a critical illness, participants will begin to develop an understanding of the patient's experience of critical illness. Participants will explore the concept of partnership and its influence on nurse-patient relationships and learner-teacher relationship. Theory will be presented on comprehensive health assessment and clinical decision-making framework.

**NSCC 7200 Critical Care Nursing Theory I —**

Expands the technology as practice of critical care nursing within the context of patients' experience of critical illness. Specifically participants will have opportunities to further develop and apply nursing knowledge about assessment, monitoring, interventions, healing and comfort for individuals who experience imbalances in oxygen supply and demand (e.g., MI, angina, CHF) and oxygenation and ventilation (e.g., respiratory insufficiency). Participants will examine the concepts of crisis theory and vulnerability and the relationship of these concepts to patients' experience of potentially life threatening illness. The concept of partnership will further be expanded upon by exploring the meaning of collaboration and decision-making within the critical care setting.

**NSCC 7300 Critical Care Nursing Clinical 1** — Focuses on applying and integrating nursing knowledge to provide nursing care for critically ill patients experiencing common health problems such as MI, angina, CHF, and respiratory insufficiency. Learners have the opportunity to further develop their comprehensive assessment abilities, monitoring skills, and clinical decision-making. By working in partnership with the patient and developing an understanding of his/her unique experience of critical illness, the learner seeks to promote comfort and facilitate healing. Theory will be presented concerning the significance of the environmental context of critical care nursing to patient care. Laboratory experiences to practice airway management, care of the patient with a central line, and cardiac arrest management are included.

**NSCC 7400 Critical Care Nursing Theory 2** — Expands the technology as practice of critical care nursing within the context of patients' and family members' experiences of critical illness. Exploring increasingly complex health problems (e.g., head injury, drug poisoning, acute respiratory failure, GI dysfunctions) will provide opportunities to integrate and expand knowledge of assessment, monitoring, interventions, healing and comfort. Participants will examine concepts such as loss and grief, hope, suffering, and ethical issues and patients' and family members' experience with potentially life threatening illness.

**NSCC 7500 Critical Care Clinical 2** — Focuses on applying and integrating nursing knowledge to provide competent nursing care for increasingly complex critically ill patients and their family members (e.g., head injury, drug poisoning, acute respiratory failure, GI dysfunctions). Learners have the opportunity to further develop their comprehensive assessment abilities, monitoring skills and clinical decision-making. By creating partnerships with patients, family members, colleagues and other members of the health care team, learners seek to promote comfort and facilitate healing. The significance of the context of the critical care environment as it relates to engaging in partnership will be explored. Laboratory experiences to develop and integrate knowledge related to the care of the patient with mechanical ventilation, invasive hemodynamic monitoring, ICP monitoring and advanced cardiac arrest management are included.

**NSCC 7600 Care of Patients with a Complex Critical Illness** — Combines theory and clinical experiences to provide participants with an opportunity to explore patients' and family members experience of life-threatening illness (e.g., SIRS, ARDS, sepsis, DIC, MSOF). Advanced theory related to oxygen supply and demand, oxygenation and ventilation, cellular changes, death and dying, quality of life issues, and ethical concerns are critically examined. Building on all previous learning, participants will implement their technology as practice in complex patient care situations.

## **SPECIALTY NURSING/ EMERGENCY**

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**NSER 7100 Introduction to Emergency Nursing Theory 1** — Allows the nurse to begin to develop his/her role within emergency nursing by focusing on the individuals' personal meaning of health and perception of emergency experiences. Through exploration of transitions and factors influencing the balance of health and its relationship to the emergency context, the nurse gains insight into the role of caring in emergency nursing. The concept of partnership is emphasized through understanding of the clients' and nurses' values, assumptions, perceptions and beliefs and a focus on processes for effective communication. Frameworks for assessment, inquiry, and critical thinking contribute to the nurses' understanding of the process of decision-making in an emergency environment. Assignments and a workshop/video conference provide opportunities for practice and integration of knowledge and skills.

**NSER 7200 Emergency Nursing Theory 2** — Builds on concepts, theories and frameworks presented in the Introduction to Emergency Nursing Theory 1, this course applies and integrates this knowledge with diverse presentations of common/less complex emergency health challenges. Examination of physiological, epidemiological and pathophysiological concepts and principals provide foundation for further understanding of transitions and balance of health states. Through exploration of concepts, such as, crisis, uncertainty, and vulnerability and by expanding sources of assessment, the nurse gains broader understanding of the clients lived experience in the emergency setting and a deeper meaning of professional caring. Emphasis is placed on critical thinking and inquiry to analyze data, surface assumptions, beliefs and perspectives and creatively explore the context and processes of clinical decision-making. Through this course the nurse continues to build on verbal and written communication skills and the development of collaborative approaches. Assignments and workshops/video conferences provide opportunities to practice and integrate skills.

**NSER 7300 Emergency Nursing Clinical 1** — Allows the nurse to further develop and begins to enact his/her role in emergency nursing by exploring an emergency environment and assessing influences pertaining to clients and families' experiences and health. Building upon theory and frameworks from the preceding two courses, the nurse will focus on developing comprehensive assessment skills and apply this knowledge to critically examine clinical decision-making processes in caring for clients and families with common/less complex health challenges. The nurse will continue to explore the ways and meaning of emergency nursing care by developing and fostering collaborative relationships with clients, families, colleagues, instructors and other health care providers. The development of critical thinking and systematic inquiry and communication skills will be emphasized throughout this course. Clinical placements will be available in either a three and a half week block or over one week full time and two days a week for seven weeks.

**NSER 7400 Emergency Nursing Theory**

— Continues to expand his/her vision of emergency nursing by focusing on broader environmental contexts and assessing their relationship with health determination, *disease/injury prevention and health promotion*. Further refining skills of assessment, decision-making and validation, the nurse will focus on diverse presentations of complex emergency health challenges. Issues related to caring in emergency will be examined with an emphasis on broadening perspectives, challenging assumptions about practice and creating empowering relationships. The nurse will continue to develop effective communication skills and apply this learning to contexts involving crisis or conflict. Assignments and a workshop/video conference provide opportunities for practice and integration of knowledge and skills. Prerequisite: NSER 7300.

**NSER 7500 Emergency Nursing Clinical 2**

— Builds on knowledge and skills acquired in previous theory and clinical courses, the nurse continues to develop expanded meaning and apply reflective practice to his/her role as an emergency nurse. *Broader perspectives of communities, environment and health care resources are incorporated into the nurses' understanding of health assessment and emergency nursing care.* With a focus on a diversity of complex health care challenges and issues arising in emergency practice, the nurse uses systemic and reflective approaches to gain knowledge, make and evaluate clinical judgements, and examine and challenge practice. Developing confidence in the provision of competent emergency nursing care is central to this course. Communication skills and relationship building strategies are emphasized as the nurse assumes an active role in creating partnerships with clients and families and participating in multimember/interdisciplinary teams. *This four and a half week clinical experience will integrate workshops/laboratories to practice and integrate knowledge and skills in such areas as cardiac arrest management and trauma care and may be done in a block of time or over two weeks full time and two days a week for five weeks.*

**NSER 7600 Emergency Preceptorships: Pediatric/Trauma/Psychiatric Care** —

Presents a theoretical and clinically integrated preceptorship course to provide opportunities for the nurse to gain a more in-depth understanding of focused client population groups with specific health care challenges. Building on knowledge and skills acquired in previous theory and clinical courses, the nurse will examine new theories and frameworks, explore a variety of resources and apply these to comprehensive nursing care of clients and families in the emergency setting. Related concepts, issues and practice challenges will be examined in the context of caring and clinical decision-initiative. Emphasis will be placed on the development of critical, reflective thought and initiative in exploring routes of inquiry, experience and growth. The student will collaborate with faculty in developing a self-directed plan of study and develop partnerships through clinical placements to augment goals and experience.

**SPECIALTY NURSING/  
NEONATAL****NSNE 7100 Neonatal Nursing Theory I**

— Focuses on the characteristics of infants and families which impact their vulnerability. Gestational age, transition to extrauterine life, infant behavior, and family-centred care will be examined. In addition, the role of the neonatal nurse and the partnership relationship between the nurse and the infant and family will be explored.

**NSNE 7200 Neonatal Theory 2** — Builds on the concepts presented in NSNE 7110. Infants with a variety of health challenges are presented in a case study format. Critical thinking, communication, collaboration, and systematic inquiry will be emphasized as the processes in which nurses engage in order to care for infants experiencing health challenges.

**NSNE 7300 Neonatal Clinical 1** —

Provides a three-week clinical course focusing on the care of infants with health challenges, this course is an introduction to clinical nursing care of infants. The setting in which this course occurs will vary depending on students' learning needs. The course is centred around learning activities which are flexible and enable students to obtain a tailored clinical experience. Through these learning activities, students are provided with opportunities to develop the communication, collaboration, critical thinking, and systematic inquiry skills necessary to provide infant and family-centred care. In particular, students will focus on partnerships, assessment in clinical decision-making, and assessment in neonatal nursing.

**NSNE 7400 Neonatal Theory 3** —

Provides a phenomenologic approach to family-centred care will be used to build on student's communication, collaboration, systematic inquiry, critical thinking and professional caring abilities. Emphasis will be placed on multiple perspectives, narrative meaning, partnerships with families and change. Students will interact with a selected family and a professional mentor in order to engage in these processes.

**NSNE 7500 Neonatal Clinical 2** —

Presents a three-week clinical course focusing on the care of infants with health challenges and their families. The setting in which this clinical course occurs will vary depending on students' learning needs. The course is centered around learning activities which are flexible and enable students to obtain a tailored clinical experience. Through these learning activities, students are provided with opportunities to build on the communication, collaboration, critical thinking, and systematic inquiry skills necessary to provide family-centered care. Additionally, opportunities to examine advocacy, as a component of professional caring, will be provided.

**NSNE 8800 Neonatal Clinical 3** — Allows students to develop an individual learning contract focused on impacting the health of a selected community. The learning contract will enable students to develop creative leadership, professional caring, and systematic inquiry skills within the health care context of their choice.

**NSNE 7900 Clinical Preceptorship in Neonatal Nursing** — Provides additional clinical practice. The learning intentions, learning activities, and evaluation strategies are established once the student and the course tutor have determined what the student's learning needs are. The course may be used to provide novice neonatal nursing with additional time to focus on the basics, or it may be used to provide clinical practice in an area not addressed in the required clinical courses.

**NSNE 7910 Care of the Critically Ill Infant Theory (Elective)** — Presents, using a case study format, a variety of infants with life-threatening health challenges in order to examine the nursing care of these infants and their families. Opportunities for students to acquire the critical thinking, communication, and collaboration skills necessary to care for these infants and families will be provided. In addition, professional caring within the partnership relationship between the nurse and the infant and family will be explored.

**NSNE 7920 Care of the Critically Ill Infant Clinical (Elective)** — Designed as a two-week clinical course in a tertiary level special care nursery, this course provides students with opportunities to develop the communication, critical thinking, collaboration, and systematic inquiry skills necessary to provide nursing care for critically ill infants and their families. Opportunities to participate in a variety of learning activities such as high-risk resuscitation, and observation of surgery will be provided pending their availability.

**NSNE 7930 Independent Study in Neonatal Nursing** — *Unavailable.*

## **SPECIALTY NURSING/ NEPHROLOGY**

### **NSNN 7200 Nephrology Theory 1: Introduction to Nephrology Nursing** —

This course introduces nephrology nursing and focuses on the experience of the individual during the predialysis phase of chronic renal failure, allowing the nurse to understand the individual with renal disease as a person before they are labeled as "patient". Understanding of the pathophysiology of renal disease, the trajectory of renal disease, and the lived experience of various individuals will be used to develop an understanding of the physiological, psychological and social impact of renal disease as it varies over the life span and with individuals. The course also focuses on the nursing role in the management of the impact of renal disease during the predialysis phase.

**NSNN 7300 Nephrology Clinical 1:  
Predialysis Nursing Care** — Includes the equivalent of a one week clinical experience in a predialysis clinic and opportunities to analyze that experience in light of theoretical perspectives from reassert, literature and the preceding theory course. These experiences will allow the student to meet individuals with renal disease during the predialysis phase and to understand the services offered at that clinic. The clinical placement is arranged over one week full-time, or one day per week for five weeks. During this time, students learn about the services available, the roles of various health care team members and about the experience of individual clients and health team members through attendance at clinics, interviews, home visits, etc. This course may be taken concurrently with Introduction to Nephrology Nursing Theory or Introduction to Dialysis Nursing.

**NSNN 7400 Nephrology Theory 2:  
Introduction to Dialysis Nursing** — Focuses on the experience of the individual on dialysis. Understanding of the principles of hemodialysis and peritoneal dialysis, the complications of dialysis and the lived experience of various individuals will be used to develop the nursing role in the management of the physiological, psychological and social impact of dialysis within the context of health care organizations and the health care system.

### **NSNN 7500 Nephrology Clinical 2: Nursing Care of the Person on Dialysis** —

Allows the nurse enact his/her role by caring for individuals on dialysis in the context of an assisted care dialysis unit. The course will begin with lab sessions in which technical skills such as needling, establishing dialysis, and trouble shooting, will be practiced. Building on the preceding theory course, the nurse will learn from clients, develop empowering partnerships with individual clients, and will begin to develop competence in managing hemodialysis. Clinical experiences are arranged on the basis of four weeks full-time, or one week full-time and three days per week x five weeks.

### **NSNN 7600 Nephrology Theory 3: Complex Health Challenges For People with Renal Disease** —

Focuses on the experience of the person and family living with complex health challenges. Specific complex situations, such as difficult dialysis access, diabetes, HIV/AIDS, malnutrition, encephalopathy, transplantation, and transplant rejection, will be examined with regard to the their physical, psychological and social impact on the individual with renal disease and their family members. The nursing role in relation to individuals, family members and the management of dialysis in the context of complex health challenges will be developed through critical thinking and systematic inquiry.

### **NSNN 7700 Nephrology Clinical 3: Nursing Care of the Person with Renal Disease and Complex Health Challenges** —

Designed within the context of a hospital based dialysis unit to allow the nurse to develop his/her role in relation to individuals with complex health challenges and family members. Through critical thinking and systematic inquiry, the nurse will challenge and change current nursing practice and seek to develop empowering partnerships with clients, family members and members of the health care team. The nurse will develop competence in the management of hemodialysis, and will focus on peritoneal dialysis primarily as a teaching-learning experience. Additional observational experiences related to transplant care, hemodialysis in critical care, etc. will be arranged as possible. Clinical experiences are arranged on the basis of four weeks full-time or one week full-time and two days per week for eight weeks

## SPECIALTY NURSING/ OCCUPATIONAL HEALTH

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**NSOH 7100 Introduction to Occupational Health Nursing** — Introduces occupational health nursing and focuses on work and its relationship to health. It introduces the student to the leadership role of the occupational health nurse through the beginning use of frameworks, epidemiological principles, and relevant legislation. There is an emphasis on building partnerships with individual employees, management, labor, and other health and safety team members.

**NSOH 7200 Work and Work Environments 1** — Presents theory related to potential hazards found in various work settings. It focuses on the industrial hygiene principles and practices of anticipating, recognizing and evaluating biological, chemical and physical hazards. The course emphasizes a collaborative approach to eliminating or controlling these hazards, whether the occupational health nurse is a member of a team of one or more Occupational Health and Safety practitioners is the only on-site practitioner with knowledge and skills in industrial hygiene.

**NSOH 7250 Work and Work Environments 2** — Expands on the theory presented in Work and Work Environments 1 by presenting theory and principles required to anticipate, recognize, and evaluate factors in the workplace related to psychosocial, safety and ergonomic issues. It emphasizes a collaborative approach to preventing or minimizing issues arising from these factors and explores methods of communicating corrective action plans. This course forms a bridge to future learning in assessing worker health by providing practice in analyzing jobs for their environmental, psychosocial, safety, and biomechanical demands on employees. Prerequisites: NSOH 7100 (or NSOH 7110 and ANOH 5100) and NSOH 7200 or ANOH 5100 and ANOH 5220.

**NSOH 7300 Occupational Health Nursing Clinical 1** — Designed as a three-week full-time clinical course to provide the nurse with opportunities to build on communication, collaboration, critical thinking, and systematic inquiry skills related to the role of occupational health nurse. The focus of the course will be on working in groups to assess work environments and analyze jobs, making recommendations when appropriate to improve the health and safety of the workplace. A number of site-visits will be arranged.

**NSOH 7400 Occupational Health Assessments** — Emphasizes “fitness for work” nursing assessments for both new employees and those experiencing illness or injury. Participants will apply their previous learning in job analysis to develop and use job-specific health standards in presented case scenarios. Opportunities will be provided through case scenarios for planning clinical and organizational strategies designed to manage disabilities in the workplace.

**NSOH 7450 Occupational Health Surveillance** — Presents concepts, principles, and theory of occupational toxicology within a case study format. The cases will emphasize a collaborative approach to anticipating, preventing, recognizing and addressing potential related health risks. Participants will explore the occupational health nursing role in providing leadership in this process.

**NSOH 7500 Occupational Health Nursing Clinical 2** — Designed as a three-week, full-time session to provide an opportunity for the nurse to integrate and apply previous learning. Workshops on communication and health assessment skills are followed by an opportunity to provide work-related health assessments for volunteer workers. One day will be spent at the Rehabilitation Centre and another with the Hearing Conservation Section at the Workers' Compensation Board in Richmond. Additional field visits will be arranged.

**NSOH 7600 Occupational Health Program Planning** — Presents the learner with an opportunity to develop a consultative approach while designing a program addressing a specific workplace health risk. The program plan will include documentation of a needs assessment, relevant goals and objectives and strategies for implementation and evaluation. The learner defines the workgroup at risk, develops collaborative relationships with stakeholders and advocates improved workplace health and safety through written and verbal presentations of the program plan. Learners will present their proposals at a scheduled workshop; learners unable to attend the workshop will contract individually to complete the course requirements.

**NSOH 8800 Occupational Health Nursing: Creating the Future** — Focus of this course is on supporting the student's role in creating the future for their own career and for the health and safety of an organization. Through theory and practice students will have an opportunity to expand the independent nature of their practice and strengthen the contribution they make to an organization. Learners initiate a collaborative partnership with an organization and use a systematic approach to assess its health and safety needs and the internal and external resources available to address them. Based on the assessment and the participation of the organization, the learner establishes priorities and develops a dynamic plan to address the health and safety needs. The learner may require two terms to complete this course.

## SPECIALTY NURSING/ PEDIATRIC

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**NSPE 7100 Pediatric Nursing Theory 1** — Introduces the specialties of pediatric and pediatric critical care nursing, this course focuses on the characteristics of children and families which influence how they interpret and respond to their environment. It examines the role of the pediatric nurse and the partnership relationship between the nurse, child and family.

**NSPE 7200 Pediatric Theory 2:**  
**Acute Illness** — *Under development.*

**NSPE 7210 Pediatric Theory 2:**  
**Critical Care** — Builds on the concepts presented in NSPE 7100. Children with a variety of common health challenges are presented in a case study format. Critical thinking, communication, collaboration and systematic inquiry will be emphasized as the processes in which nurses engage in order to care for children experiencing health challenges.

**NSPE 7300 Pediatric Nursing Clinical 1**  
— Designed as a three-week clinical course focusing on the care of children with health challenges, this course is an introduction to clinical nursing care of infants and children. The setting in which this course occurs will vary depending on students' learning needs. The course is centered around learning activities which are flexible and enable students to obtain a tailored clinical experience. Through these learning activities, students are provided with opportunities to develop the communication, collaboration, critical thinking, and systematic inquiry skills necessary to provide child and family-centred care. In particular, students will focus on partnerships, assessment and care planning in pediatric nursing.

**NSPE 7400 Pediatric Nursing Theory 3** — Uses a phenomenological approach to family-centred care to build on students' communication, collaboration, systematic inquiry, critical thinking, and professional caring processes. Emphasis will be placed on multiple perspectives, narrative meaning, partnerships with families and change. Students will interact with a selected family and a professional member in order to engage in the learning activities and assignments for this course.

**NSPE 7500 Pediatric Nursing Clinical 2**  
— Designed as a three-week clinical course focusing on the care of infants and children with health challenges and their families. The setting in which this clinical course occurs will vary depending on students' learning needs. The course is centred around learning activities which are flexible and enable students to obtain a tailored clinical experience. Through these learning activities, students are provided with opportunities to build on the communication, collaboration, critical thinking, and systematic inquiry skills necessary to provide family-centred care. In addition, clinical decision-making and articulation of a personal practice framework for pediatric nursing will be emphasized.

**NSPE 7900 Pediatric Preceptorship** — Provides additional clinical practice. The learning intentions, learning activities, and evaluation strategies are established once the student and the course tutor have determined what the student's learning needs are. The course may be used to provide novice pediatric nursing with additional time to focus on the basics, or it may be used to provide clinical practice in an area not addressed in the required clinical courses.

**NSPE 7910 Pediatric Nursing in the Home (Elective)** — Presents concepts and theories relevant to the care of children with complex medical and nursing care needs who are living at home with their families. Using a case study format, learners will have the opportunity to develop the knowledge and skills in order to promote the health of these children and their families. Learners will explore nursing practice issues particularly relevant to nursing practice in the home and community setting.

**NSPE 7920 Pediatric Arrest Management (Elective)** — Designed as a guided learning course addressing nursing care when an infant or child faces respiratory and/or cardiac arrest. Using a case study format, students have the opportunity to develop skills in critical thinking, systematic inquiry and collaboration as they focus on anticipation and prevention in potential and actual arrest situations.

**NSPE 7930 Independent Study in Pediatric Nursing (Elective)** — Provides an opportunity for students and the course tutor to collaborate on learning intentions, learning activities and evaluation strategies.

## **SPECIALTY NURSING/ PERINATAL**

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**NSPN 7100 Perinatal Theory 1: The Healthy Childbearing Experience** — Focuses on the healthy childbearing experience. Within the context of building partnerships, this course exposes the learner to caring for childbearing women, their fetus/newborn, and families.

**NSPN 7200 Perinatal Theory 2: Nursing Care of the Childbearing Woman** — Builds on the concepts presented in The Healthy Childbearing Experience. From a holistic perspective, childbearing women/families facing perinatal health challenges are presented to the learner in case study format. Once the successful outcome of pregnancy is potentially threatened, women/families depend on the health care system in a different way. Their access to resources will be explored.

**NSPN 7300 Perinatal Clinical 1** — Introduction to caring for childbearing women and their families in a single-room maternity care setting, including the home. The course provides students with opportunities to develop the critical thinking, communication, collaboration and systematic inquiry skills necessary to provide woman and family-centred care. In particular, the development of clinical assessment skills will be emphasized including an orientation to the appropriate technical equipment. A two-week, week instructor-based clinical experience, preceded and followed by a one-week preceptorship is arranged with an acute care agency.

**NSPN 7400 Perinatal Theory 3: Nursing Care of Childbearing Families** — Presents a phenomenological approach to family-centred care to build on student's communication, collaboration, systematic inquiry, critical thinking and professional caring abilities. Emphasis will be placed on multiple perspectives, narrative meaning, partnerships with families and change. Students will interact with selected family and a professional member in order to engage in the learning activities and assignments for this course.

**NSPN 7500 Perinatal Clinical 2** — Builds upon the skills acquired in Perinatal Clinical and focuses on the care of childbearing women with common health challenges and their families. The course provides students with opportunities to build on the critical thinking, communication, collaboration, and systematic inquiry skills necessary to provide family-centred care. Experiences to examine advocacy, as a component of professional caring, will be provided. In particular, clinical decision-making and articulation of a personal practice framework for perinatal nursing will be emphasized. Clinical experiences with an instructor in single room maternity care settings are arranged over two weeks full-time, followed by a two week preceptorship component in both hospital, home and community environments.

**NSPN 7910 Perinatal Care in the Family (Elective)** — Focuses on the continuity of care throughout the childbearing experience. Students will be accompanying a childbearing family during their pregnancy, birth, and transition to parenthood. Opportunities to attend events with the family related to the childbearing process will be encouraged.

## **SPECIALTY NURSING/ PERIOPERATIVE**

**NSPO 7100 Perioperative Theory 1: Developing Partnerships** — Presented as a theory course to introduce participants to the perioperative nursing specialty and the role of the nurse within the specialty by examining the individual's perception of the perioperative experience. Participants will examine the concept of health and their understanding of health as it relates to the perioperative experience and perioperative nursing. By interviewing a person who has experienced anesthesia and surgery, participants will gain insight into the factors that influence patients' perceptions of their experience. Through exploration of the concepts of caring and partnership and their influence on perioperative relationships plus a focus on processes of effective communication and collaboration, the enactment of patient-centred care and advocacy in perioperative nursing practice will be revealed. Frameworks for assessment, inquiry and critical thinking will be introduced to develop understanding of the process of decision-making in the perioperative environments.

**NSPO 7200 Perioperative Theory 2: The Nurse in the Circulating Role** — Builds on the concepts and frameworks presented in NSPO 7100 Developing Partnerships in Perioperative Nursing Theory 1. The focus is on the individual's experience of preparing for surgery and undergoing anesthesia. In addition the technology as perioperative practice (ways of knowing, being and doing) in the circulating role is explored. Assessment and decision-making tools will be applied within a practice framework to plan care and expand knowledge and understanding of the perioperative experience. The factors impacting the stability and vulnerability experienced by individuals from different age groups who are preparing for common, less complex surgeries and undergoing anesthesia is a major focus. Participants will build on nursing knowledge of pharmacology, anatomy and physiology and integrate it with knowledge of anesthesia and related nursing care. Principles and responsibilities related to supporting anesthesia, preparing for surgery, and maintaining a safe, supportive perioperative environment is the focus of the exploration of technology as practice within the circulating role. Participants will continue to develop communication skills by exploring the unique, non-verbal ways of communicating within the perioperative environment. Collaborative skills will be expanded to enhance the development of partnerships to support patient-centred care and participants' understanding of the concepts of caring and advocacy will be expanded by relating them to the role of the circulating nurse.

**NSPO 7300 Perioperative Clinical 1: Implementing the Circulating Role** — Designed as a four-week clinical course focusing on the care of individuals of all ages preparing for common, less complex surgeries and undergoing anesthesia; this course is an introduction to clinical nursing care of the perioperative patients and their families. The course is centred around learning activities which are flexible and enable students to integrate and apply knowledge from previous theory courses and practice to develop communication, collaboration, critical thinking and systematic inquiry skills necessary to begin to provide patient and family-centred care in perioperative settings. The aspects of technology as practice on which the participants will focus will include partnerships, assessment and care planning in the pre and intraoperative phases of the perioperative experience. The application of the principles of asepsis and safety and the enactment of professional caring using a practice framework, will enable the participant to develop skills (manual, analytic and interpersonal) within the circulating role. The participant will explore the ways of developing collaborative relationships with individuals, colleagues, instructors and other health care providers, and the meaning these relationships have within the circulating role.

**NSPO 7400 Perioperative Theory 3: The Nurse in the Scrub Role** — Continues the exploration of the individual's experience of surgery. The focus will be on common, less complex surgeries, anatomy and the principles related to surgery and healing. The participant will explore the ways and meaning of the scrub role by developing collaborative relationships with individuals, colleagues, instructors and members of the surgical team. Utilization of the concepts of advocacy, vulnerability and stability, will be stressed. The application of the principles of asepsis and safety using a practice framework will enable the participant to develop skills (manual, interpersonal and analytic) within the context of the scrub nurse role. By exploring the components of competence, confidence and conscience within the intraoperative phase the understanding of the concept of caring will be enhanced. Through this course the participant will develop understanding of the verbal and non verbal communication skills required during the intraoperative period.

**NSPO 7500 Perioperative Clinical 2: Implementing the Scrub Role** — Designed as a four-week clinical course to develop beginning competency in the scrub nurse role and gain further insight into the concept of caring with a focus towards competence, conscience and confidence through exploring the individual's intraoperative experience and providing care during surgery. By utilizing experiences that progress from simple to more complex surgical procedures, the participant will develop skills in managing the sterile surgical environment. The participant will implement a framework for practice and develop the skills (manual, interpersonal and analytic) to function independently as a scrub nurse. The development of a collaborative role within the surgical team will be emphasized. The application of the concepts of safety and stability and the principles of asepsis will create a supportive perioperative environment for the individual in transition and the members of the surgical team.

**NSPO 7600 Perioperative Theory 4: Integration of the Perioperative Roles** — Integrates knowledge from the previous courses and clinical experience with knowledge of complex surgical and anaesthetic techniques and complicating pathophysiology. This knowledge will be used to plan the perioperative care for individuals with increasing acuity who are undergoing complex surgical procedures and/or anesthesia. Integration of the perioperative roles and management of complex instrumentation will be presented. Strategies to anticipate, recognize and respond appropriately to conditions threatening the stability of the individual and of rapidly changing perioperative situations will be explored. Management of care during recovery from anesthesia and discharge planning will address nursing responsibilities related to the post operative phase. Through assignments and discussion participants will explore issues related to perioperative nursing.

**NSPO 7700 Perioperative Clinical 3: Integrated Perioperative Nursing Practice** — Focuses on the integration of the perioperative roles to provide entry level care for individuals with increasing acuity undergoing complex surgery/anesthesia. Supervised clinical experience will enable the student to gain skills in a variety of surgical specialties or with a chosen patient population. Through the use of individual learning contracts and by developing learning partnerships, the participant will work towards assuming increasing independence in practice by applying the principles, skills and knowledge developed in previous courses. Diverse perioperative environments (surgical specialties, clinics, community) will be available as clinical sites.

**NSPO 8800 Expanded Perioperative Practice** — Integrates knowledge of perioperative nursing and knowledge gained from the previous three theory courses with new knowledge about health care within the community for individuals preparing for or recovering from surgery. The participant will independently explore the holistic care of individuals in transition through an expanded perioperative time frame and in a variety of environments. Building on communication skills, participants will develop skills of networking and interdisciplinary collaboration to create partnerships for care and learning within an expanded perioperative environment: specialized perioperative settings, individual's homes and the community. Entry level perioperative knowledge and skills will be expanded in relation to assessment, teaching and discharge planning, to collaboratively manage individual's preparation for and recovery, discharge and rehabilitation from, their perioperative experience. Methods of evaluating and assuring quality patient care will be applied, and professional issues and ethical dilemmas related to expanded perioperative practice will be examined. Assignments and the keeping of an experience log will provide opportunity for further development of written and verbal skills and reflection in and on practice.

## SPECIALTY NURSING/ COURSES COURSES

**NSSC 7115 Client Education: Learning through Partnership** — Asks students to develop and expand their philosophy of education, their understanding of educational theory and their practical teaching skills in the context of health education. Students are asked to complete a client education project to further develop practical skills for meeting the challenges of formal and informal teaching in clinical practice.

**NSSC 8000 Systematic Inquiry** — Assists the learner to engage in a process of "knowing" in order to enhance the learner's ability to create and use knowledge from a variety of sources. Learners have opportunities to apply their critical thinking skills in the systematic evaluation of various sources of knowledge for nursing practice including personal knowledge, and formal research. The relationship between theory, research, and practice will be considered and the opportunity to build a partnership using a systematic inquiry process to influence the learner's own knowledge based practice. Prerequisite: Specialty Nursing Certificate or Advanced Diploma.

**NSSC 8300 Creative Leadership** — Offers students the opportunity to develop a vision of creative leadership within the context of their specialty practice. Leadership will be explored from multiple perspectives and the complementary relationship between leaders, followers and managers will be discussed. The contextual aspects of leadership are examined, as well as the role of professionalism and fostering change and partnerships. Students will discover how leadership initiatives make a difference to client outcomes within their practice environment. Prerequisites: Completed Specialty Nursing Certificate and BUSA 7250.

**NSSC 8500 Professional Growth** — Expands the learner's scope of professional practice in specialty nursing. Through reflection, the learner is given the opportunity to examine their growth in relationship to specialty nursing practice. By participating in a mentoring relationship, the learner explores expert practice with a focus on clinical judgement, caring and moral/ethical perspectives. The goal of this course is to support learners in developing their own vision of expert specialty nursing practice. Prerequisite: Completed Specialty Nursing Certificate or Advanced Diploma.



**NSSC 8600 Specialty Nursing Practice and Community** — *Under development.*

**NSSC 8800 Community Health Issues/Action** — *Under development.*

## ENGINEERING TECHNOLOGY ENTRY

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### **NTRY 0301 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 concerns. Other topics will be decided through instructor-student discussions.

## NURSING

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### **NURS 1000 Nursing and Health Issues 1**

— Explores selected common health problems in order to understand the impact this problem has for the individual, family, health care system and society. While developing their understanding, students will access information from a variety of sources including professionals in hospitals and in the community. A thorough exploration of the health problem/situation will assist students in developing a professional context from which they can plan nursing care. The teaching/learning strategy used in this course is problem based learning. The health problems discussed in this course are sexually transmitted diseases, and cerebrovascular accidents (stroke).

### **NURS 1019 Clinical Techniques 1**

**Assessment** — Presents essential behaviors for conducting psychosocial and physical assessment. It includes techniques for taking a health history in order to identify health needs. Opportunity for practise and demonstration of the learned skills is provided.

### **NURS 1020 Clinical Techniques 1**

**Laboratory** — Presents basic nursing skills related to hygiene, touch therapies and therapeutic touch, movement and rest, feeding, oxygen use, voiding, bowel care, and oral and topical medications. Emphasis is placed on student understanding of the purpose of the skill, focused assessment related to the skill, as well as the safe and confident demonstration of it. The communication and research aspects of the skills are also included. Student independent and laboratory practise, demonstrations and examinations are part of the course.

### **NURS 1030 Nursing Practicum 1** —

Expects students to provide knowledgeable and safe nursing care. The scope of nursing practice includes recognition and consideration of patient health needs when they enter the hospital as well as health needs which will require follow-up on discharge. Context of practice: Adult Medicine. Prerequisite: NURS 1019.

### **NURS 1040 Professional Practice Seminar 1**

— Presents the concepts of the BCIT Nursing model and philosophy, professionalism and the professional association so that students will understand the professional basis of nursing practice. Computer work, projects, written assignments and discussions with peers and faculty are part of the course.

### **NURS 1050 Interpersonal Communication**

— Presents the components of healing communication from a nursing perspective including caregiver predisposition qualities, and caregiver skills. Simulated patients, student video demonstrations of own communication ability, laboratory exercises, independent study, and discussions with peers and faculty are part of the course.

### **NURS 1060 Pharmacology**

— Presents important concepts and principles related to pharmacology. The course will assist students to relate drug action(s) to patient physiology and/or pathophysiology and to anticipate effects based on this understanding. Nursing interventions related to monitoring patient response to drugs will be emphasized. Nursing's role in health promotion and patient teaching will be discussed. Drug classifications will be presented to assist the learner to appreciate the scope of pharmacological treatment and to assist the learner to sort, categorize and retrieve information about selected drugs.

**NURS 1180 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 1181 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 practise basic technical skills and procedures required in emergency situations.

### **NURS 1182 Patient Care (BMED)**

— 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.

### **NURS 1183 Patient Care (PROR)**

— Assists the student to understand, describe, and implement specific patient care skills required to work effectively with patients in prosthetics and/or orthotics situations. The course addresses such topics as proper procedures for lifting or transferring patients, and appropriate interventions in emergency situations.

### **NURS 1184 Patient Care (ENPY)**

— 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.

### **NURS 2000 Nursing and Health Issues 2**

— Explores selected common health problems in order to understand the impact this problem has for the individual, family, health care system and society. While developing their understanding, students will access information from a variety of sources including professionals in hospitals and in the community. A thorough exploration of the health problem/situation will assist students in developing a professional context from which they can plan nursing care. The teaching/learning strategy used in this course is problem-based learning. The health problems discussed in this course are arthritis/rheumatism, cancers, and gastrointestinal disorders. Prerequisite: NURS 1000.

**NURS 2020 Clinical Techniques 2**

**Laboratory** — Presents hands-on nursing skills related to relaxation therapies, surgical asepsis, wound care, injections, intravenous therapy, nasogastric tubes, suprapubic catheters and colostomy care and irrigations. Emphasis is placed on student understanding of the purpose of the skill, focused assessment related to the skill, as well as the safe and confident demonstration of it. The communication and research aspects of the skills are also included. Student independent and laboratory practice, demonstrations and examinations are part of the course. Prerequisite: NURS 1020.

**NURS 2030 Nursing Practicum 2** —

Expects students to provide knowledgeable and safe nursing care. The scope of nursing practice includes recognition and consideration of patient health needs when they enter the hospital as well as health needs which will require follow-up on discharge. Context of practice: Adult Surgery. Prerequisites: NURS 1000, 1020, 1030, 1040.

**NURS 2040 Professional Practice**

**Seminar 2** — Expands the concepts of specialization, technology as practice, nursing as art, research based practice, ethics, and legality so that students will continue to develop a professional role perspective. The concept of nursing theory and multi-disciplinary team is introduced. Computer work, projects, written assignments, and discussions with other students, peers, and faculty are part of the course. Prerequisite: NURS 1040.

**NURS 2180 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.

**NURS 3000 Nursing and Health Issues 3**

— Explores selected common health problems in order to understand the impact this problem has for the individual, family, health care system and society. While developing their understanding, students will access information from a variety of sources including professionals in hospitals and in the community. A thorough exploration of the health problem/situation will assist students in developing a professional context from which they can plan nursing care. The teaching/learning strategy used in this course is problem based learning. The common health problems discussed are pregnancy/childbearing complications, gastro enteritis in children, and schizophrenia. Prerequisite: NURS 2000.

**NURS 3020 Clinical Techniques 3**

**Laboratory** — Laboratory. Presents hands-on nursing skills related to complex wound care, use of blood glucose monitors, blood products, central intravenous therapy saline locks and medications by push, catheterization, chest drainage, nasogastric and feeding tube insertion care, and pain management therapies. Emphasis is placed on student understanding of the purpose of the skill, focused assessment related to the skill, as well as the safe and confident demonstration of it. The communication and research aspects of the skills are also included. Student independent and laboratory practice, demonstrations and examinations are part of the course. Prerequisite: NURS 2020.

**NURS 3030 Nursing Practicum 3** —

Provides an opportunity for students to gain nursing experience in specialty units. Students will be expected to provide knowledgeable and safe nursing care. The scope of nursing practice includes recognition and consideration of patient health needs when they enter the hospital as well as health needs which will require follow-up on discharge. Context of practice: Maternal Child Health, Adult Psychiatry. Prerequisites: NURS 1050, 2000, 2020, 2030.

**NURS 4000 Nursing and Health Issues 4**

— Explores selected common health problems to understand the impact they have for the individual, family, health care system and society. While developing their understanding, students will access information from a variety of sources including professionals in hospitals and in the community. A thorough exploration of the health problem/situation will assist students in developing a professional context from which they can plan nursing care. The teaching/learning strategy used in this course is problem based learning. The common health problems discussed are accidents, diabetes, dementia, and system failure. Prerequisite: NURS 3000.

**NURS 4030 Nursing Practicum 4** — This

practicum experience will occur on a variety of units which may have a specialized focus. Students will be expected to provide knowledgeable and safe nursing care. The scope of nursing practice includes recognition and consideration of patient health needs when they enter the hospital as well as health needs which will require follow-up on discharge. Context of practice: Adult Medicine and Surgery. Prerequisites: NURS 3000, 3030.

**NURS 4530 Nursing Practicum 5** — This practicum experience will occur in a variety of institutions throughout the Lower Mainland and in a variety of units within those institutions. The units may be specialized in focus. Working in collaboration with the RN preceptor, the students are expected to assume the workload and professionalism of a beginning RN by the end of the practicum experience.

## OCCUPATIONAL HEALTH/SAFETY

**OCHS 1143 OCHS Legislation** — Deals with legislation relevant to the safety field, claims management, safety policies, the concept of workers' compensation, the structure of a Workers' Compensation Board, appeals procedures, the right to know, the right to refuse and the right to participate.

**OCHS 1146 Industrial Engineering I** —

Presents a six-step systematic approach to methods improvement. The student will learn specific industrial engineering techniques.

**OCHS 1161 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 task analysis, maintaining interest in safety, motivation, the problem employee and management of a safety program.

**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 1433 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.

**OCHS 1441 Introduction to Safety for Operations Management** — Introduces industrial health and safety. Introduction to safety and accident prevention, accident report writing, safety in the workplace.

**OCHS 1460 Fire Prevention and Security** — Deals with fire prevention and protection. Topics include 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 Safety Engineering and Training** — Explores the technical aspects of safety. 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 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 3450 Occupational Hygiene** — Under development.

**OCHS 4458 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.

## OPERATIONS MANAGEMENT

**OPMT 0300 Learning Skills** — Helps participants learn more efficiently and effectively. Participants will learn success strategies in learning styles, reading, note taking, memory techniques, time and stress management, test writing, study skills and working in groups. The practical ideals will benefit participants while at BCIT and later in the workplace.

**OPMT 1108 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 1109 Industrial Practicum I** — 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 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 1113 Applied Mathematics** — Splits material covered into three 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. These will be applied to financial and industrial problems. The third phase will cover matrices and determinants.

**OPMT 1119 Information Systems** — Intended as an introduction to information systems using a PC environment. Aspects of hardware, software, data structure and management, computer networks, communications basics and security procedures will be discussed. The use of operating systems (DOS and Windows) and application software (word processing, spreadsheets and databases) relevant to other courses and the workplace will give students hands-on experience.

**OPMT 1121 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. Calculation is done using spreadsheets.

**OPMT 1130 Business Statistics** — Includes 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. Spreadsheets are used for calculations.

**OPMT 1133 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.

**OPMT 1140 Tools for Quality Management** — Begins a series of interrelated Operations Management courses. The students will be introduced to the field of Operations Management, Total Quality Management (TQM) and process improvement. A special emphasis will be placed on the development of teamwork skills and problem-solving approaches to improvement opportunities. Using cooperative learning techniques, the student will work in groups to learn and apply process improvement techniques to case studies. During the course, there will be field trips to organizations that are practicing techniques discussed in the classroom.

**OPMT 1147 Production/Inventory Management I** — Emphasizes practical material that can be used with little modification in production or operating environments. 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 1148 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 1164 Management Engineering I for Wood Products** — Presents a systematic approach to process and productivity improvement as an individual or in a team setting. Topics include identify opportunities for improvement, collect meaningful data regarding the situation, analyze and identify root causes of problems, develop appropriate solutions, plan and implement proposals, and follow-up.

**OPMT 1165 Project Management Computer Control** — Designed to assist students in the management of their technical project. The course material is divided into two main selections: Project Management and Quality Assurance. The Project Management section includes defining, planning, and organizing the project; and, project control and performance measurement. The Quality Assurance section includes quality assurance philosophies; and, ISO 9000 review, selection, certification, and registration. Prerequisite: ELEX 4330\* (\*may be taken concurrently).

**OPMT 1171 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. MRP II and Just-in-time/Total Quality Control are introduced.

**OPMT 1180 Introduction to Engineering Economics** — Provides students in the Civil and Structural program with an appreciation of the common financial practices of business and an insight into the approaches used in making sound economic decisions. Topics include financial statements and analysis, capital budgeting, and financial decisions and bankruptcy.

**OPMT 1182 Total Quality Management** — Equips Manufacturing and Plastics technology graduates with the skills to institute quality improvement projects in a production environment. Students will work in teams to develop group skills and to reinforce learning. The course develops an analytical approach to productivity improvement through reducing production variations by using industrial engineering methods. The principles of design for manufacturing and the steps leading to ISO 9000 certification are also covered.

**OPMT 1184 Industrial Engineering ROBT** — Surveys the general background of operations management in terms of planning and organizing manufacturing operations. Topics include facility location and layout, methods improvement and production/inventory management.

**OPMT 1202 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 1208 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. Calculations are done using spreadsheets.

**OPMT 1220 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 Industrial Practicum 3** — Allows students to select and define an opportunity for productivity improvement with an external corporate manager. Within the bounds of a management/student agreed to terms of reference, the students will demonstrate their abilities and skills to successfully conclude an industrial practicum.

**OPMT 1243 Introduction to Computing** — Consists of an introduction to computers and the use of industry standard software (i.e. Microsoft Office) which will permit the student to solve problems and become more productive. After a brief introduction to the Personal Computer (PC), Local Area Network (LAN) and operating system (Windows) in current use, word processing software (Word) will be used to create, edit, and format documents. Spreadsheet software (Excel) will be used to create, sort, and generate reports from flat databases. Additional software such as web browsers (Netscape Navigator) and/or presentation software (PowerPoint) may also be investigated.

**OPMT 1250 Inventory Management** — Introduces students to the first of several materials management courses. This course includes inventory management objectives, types forecasting, calculating order quantity, ordering models, and safety stock considerations.

**OPMT 1260 Management Engineering I for Building** — Provides students in the Building program with an appreciation of the common financial practices of business and an insight into the approaches used in making sound economic decisions. Topics include financial statements and analysis, capital budgeting, and financial decisions and bankruptcy.

**OPMT 1300 Ergonomics** — Deals with human factors in the scientific study of people at work, especially worker safety, health, efficiency and comfort. The course covers recent trends in the ergonomics field: physical working environment, adaptation of tools and workplace to the worker, equipment design, impact of productivity and viewpoints of workers and management.

**OPMT 1319 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.

**OPMT 1343 Operations Management for Food Technology** — Provides a basic understanding of how quality management is applied in modern food manufacturing and service industries to improve organization performance. In addition to normal regulations for the industry, global trading customers and business competition now require the implementation of a quality management system. A quality management system creates a foundation of company practice which is enhanced by the continuous improvement in all operations generated TQM. Topics include quality management, ISO 9000 family standards, economic impact of quality, measurement of quality, employee empowerment, and systematic problem-solving and continuous improvement. **OPMT 1403 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 labor productivity, storage/handling cost determination, inventory management, types of replenishment systems, distribution requirements planning (DRP), material handling equipment and warehouse layout.

**OPMT 1404 Warehouse and Purchasing Management** — Provides a fundamental knowledge of the functions and role of warehousing and purchasing in the logistics chain. Topics include performance standards, inventory management, distribution requirements handling, advanced applications of EOQ formulae, material management, customer service, and the basic components of cost trade-offs through the use of case studies.

**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 is on the types of decisions a production manager must make and on the trade-offs involved.

**OPMT 1441 Industrial Health and Safety** — Introduces industrial health and safety, accident prevention, accident report writing, safety in the workplace.

**OPMT 1445 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 1446 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 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.

**OPMT 1510 Business Mathematics** — Review of basic mathematics applicable to business and industry; mathematics of finance, including retail operations, simple and compound interest, discounts, annuities, financial papers and depreciation methods. Emphasis is on practical applications to business administration.

**OPMT 1900 Introduction to Operations Management** — Provides an overview of relevant topics in the operations management field. The material covers the application of operations management in both manufacturing and service environments. (Note: Only students enrolled in the Applied Operations Management Senior Certificate can register for this course.)

**OPMT 1915 Problem-Solving I —**

Provides a systematic approach to operations process improvement and productivity improvement in a business setting. A special emphasis will be placed on the development of teamwork skills and team problem-solving approaches. You will learn how to work in teams and as an individual analyst to select opportunities for development and improvement; record information related to the present situation; develop feasible solutions; install the new method; and, maintain the results. Topics include teamwork, an overview of various popular problem-solving models, Pareto's Law, activity sampling, process mapping, time study, cause and effect diagrams, critical examination, multiple criteria evaluation matrix, understanding the change process, and project planning and scheduling techniques. (Note: Only students enrolled in the Applied Operations Management Senior Certificate can register for this course.)

**OPMT 1930 Business Computer Skills —**

Allows students to apply the capabilities of microcomputers in the business environment. The student will become familiar with the Windows platform and be able to use word-processing to produce written business communication. You will also be able to use a spreadsheet program to create and manipulate basic business models. (Note: Only students enrolled in the Applied Operations Management Senior Certificate can register for this course.)

**OPMT 1945 Materials Management —**

Teaches basic methods of planning and controlling inventory in manufacturing, distribution, retail and institutional environments. Topics include inventory types, inventory costs, the supply chain, what to stock, when to stock, how much to stock and how to control stock. (Note: Only students enrolled in the Applied Operations Management Senior Certificate can register for this course.)

**OPMT 1950 Facilities Resource Management —** Introduces the facilities management techniques required to effectively plan and allocate and locate the space required for various work place tasks. Topics include systematic layout planning, materials handling and equipment selection. (Note: Only students enrolled in the Applied Operations Management Senior Certificate can register for this course.)

**OPMT 1965 Quality Management —**

*Currently under development.*

**OPMT 2170 Industrial Engineering —**

Intended to provide the Management Systems student with an industrial engineering approach to problem-solving and decision-making. The course material is divided into four main sections; productivity and production processes, improving existing operations, deciding future operations, and operations strategy and organization.

**OPMT 2173 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.

**OPMT 2201 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 2209 Spreadsheet 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 and (OPMT 1108 or 1110); or approval from the associate dean.

**OPMT 2240 Quality Management —**

Designed as the second of three interlinked courses in the Operations Management stream. Students will build on skills acquired in OPMT 1140 and develop further aptitude in quality management techniques. Teamwork will be used both as a teaching strategy and as a learning outcome to give students facility in this method of problem solution. Prerequisite: OPMT 1140.

**OPMT 2246 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 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 Microcomputer Applications**

— Deals with spreadsheet and database software as applied in an industrial setting. Prerequisite: COMP 1104, OPMT 1110, FMGT 1151.

**OPMT 2264 Management Engineering 2 for Wood Products —**

Designed as a directed studies course where the student selects, as a team project, a study area within an industrial operation to apply the wood products manufacturing and productivity improvement techniques learned in OPMT 1164. The student will develop a Terms of Reference defining the study area, gather data, analyze the current situation and develop solutions for recommendations to management. Findings will be presented in an oral presentation and in a final written report.

**OPMT 2265 Business Process Management** — Introduces several analytical tools that support structured approach to problem-solving with a view to improving the quality and productivity of business processes. This course builds on concepts learned in OPMT 1140 and introduces additional problem-solving tools from the fields of business analysis, systems analysis and business process reengineering. Topics include understanding the purposes and characteristics of business processes, identifying the information requirements at different organizational levels, appreciating the strategic issues that drive organizations to implement a business process improvement or reengineering approach to solve problems, mapping processes, applying a structured methodology to solve business problems, developing a purposes hierarchy, interviewing for information and developing questionnaires. Students are required to demonstrate effective teamwork skills in course project work. Prerequisite: OPMT 1140.

**OPMT 2360 Material/Capacity Requirements Planning** — Introduces the Material Requirements Planning (MRP) and Capacity Requirements Planning (CPR) applications and places them in the context of a manufacturing system. Topics include a manufacturing system model, Master Production Schedule (MPS), bills of material, logic of MRP CRP objectives, infinite vs finite loading, capacity calculations, and measuring performance.

**OPMT 2915 Problem-Solving 2** — Continues from OPMT 1915. (Note: Only students enrolled in the Applied Operations Management Senior Certificate can register for this course.)

**OPMT 3301 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. Prerequisites: OPMT 1121 and 2253.

**OPMT 3308 Quantitative Business Analysis** — Designed to increase quantitative problem-solving skills. It will focus on the use of business and industrial models. Topics include decision analysis, time series forecasting, quality control charts and sampling, multiple regression. Prerequisites: OPMT 1108, OPMT 1208, and OPMT 2209.

**OPMT 3341 Process Improvement Project** — Builds on the foundation established in OPMT 1140, OPMT 2240 and OPMT 2265. Continues the focus on the tools and techniques used to improve operations in both the industrial and service sectors of the economy. Total Quality Management (TQM) philosophies will be applied to a field project at BCIT. Prerequisites: OPMT 2240, OPMT 2265.

**OPMT 3353 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.

**OPMT 3361 Database Applications** — 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 3344 Information Technologies** — Enables the student to understand the role of information automation in the productivity improvement process. Topics include examining the application of Electronic Data Interchange (EDI), LANS, bar coding, and the use of the Internet and Intranet, to improve business operations. Prerequisite: OPMT 2209.

**OPMT 3445 Project Management** — Introduces the fundamentals of project management. Includes the unique characteristics of projects and fundamentals of project planning using techniques such as WBS, Gantt charts, CPM, dealing with people and team issues, maintenance and control of projects using check points and milestones, communication, and common sources of difficulty in project management. Use of MS Project.

**OPMT 3460 Just-In-Time Manufacturing** — Describes and analyzes how manufacturing companies are achieving improved performance by producing in smaller quantities (Just-In-Time) to meet customer demand.

Explanation of the Theory of Constraints and its relationship to JIT is covered. Development of TOC as a manufacturing philosophy is explained using a computer simulation model. Topics include set up reduction, pull systems, work cells, housekeeping, and drum-buffer-rope scheduling. Prerequisite: OPMT 2360.

**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.

**OPMT 4300 Quantitative Analysis for Finance** — Designed to increase quantitative problem-solving skills. It will focus on the use of business and industrial models. Topics include decision analysis, time series forecasting, multiple regression, linear programming. Prerequisites: OPMT 1130 with a grade of at least 60 per cent.

**OPMT 4408 Math Models for Decision-making** — Continues from OPMT 3308. Topics include additional decision analysis, linear programming, simulation and queuing theory. Prerequisite: OPMT 3308.

**OPMT 4438 Entrepreneurial Business Plan Development** — Examines the planning stages involved in starting a new business including market, financial, and legal feasibility requirements. The student develops a full business plan.

**OPMT 4440 Implementing Quality Systems** — Deals with implementing the improved process. Topics include understanding the need for change, the change process, common change tools, and techniques. Prerequisite: OPMT 3341.

**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.

**OPMT 4460 Purchasing** — Examines the principles and practices of procurement for both manufacturing and service organizations. Topics include procurement objectives, information systems, specification determination, supplier selection, pricing, negotiation, and disposal. Current practices such as vendor managed inventories and supplier partnerships will be presented.

**OPMT 4461 Information Systems 3** — Examines microcomputer system cycle (preliminary investigation, detailed investigation, software selection and design, implementation, and maintenance) 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.

**OPMT 4469 On-Line Business Applications** — Covers current computer technologies and services which can be used to increase the productivity of an organization. The course begins with a continuation of the relational database application development initiated in the OPMT 3353. Industry standard internet software (Netscape) will be used to carry out business research on-line and construct simple WEB pages. The latter part of the course focuses on electronic commerce theory and applications. A selection of leading edge computer issues will be examined. Emphasis is on material which relates to international trade and transportation logistics and ties in with the industry project course. Prerequisite: OPMT 3353.

**OPMT 4560 Logistics** — Logistics embraces all activities involved in physically acquiring, moving and storing raw material, work in progress, and finished goods from point of origin to customers. This course introduces students to current logistics issues and the impact of logistics on profitability. Topics include the supply chain concept including customer service, protective packaging and material handling, traffic function, and warehouse management. Prerequisite: OPMT 1250.

**OPMT 5740 Integrated MIS** — Enables students to appreciate the types of data which are collected into functional databases, how the data are synthesized into management information, and how this information can be integrated into the strategic decision-making process; understand current business practice for strategic information technologies - microcomputing, digital communication, image processing, relational database, artificial intelligence, graphics, voice processing, CASE, CAD/CAM, open systems, EDI, etc. You will be able to prepare and deliver effective oral and written presentation to management and work better within the project team to achieve common objectives.

**OPMT 5751 Math Models for Business** — Presents a second course in the application of statistical methods to business problems. Provides detailed theoretical understanding and practical applications of two of the most commonly used mathematical models: linear regression and time series analysis, learn to view business situations as required to solve the model. Extensive lab work using spreadsheets will lead to theoretical solutions, which will be interpreted as a guide to practical management action. Material from the first statistics course will be reviewed and used heavily; familiarity with the basic used spreadsheets is assumed. Prerequisite: Admissions to the ASTB Program.

## ORGANIZATIONAL BEHAVIOR

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**ORGB 2100 Organizational Behavior** — 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.

**ORGB 2110 Organizational Behavior** — Helps the student become more effective in dealing with the human element in a business enterprise. Topics include individual factors such as personality, attitudes, perception and motivation; group factors such as communication, leadership, power and politics, group dynamics and conflict; and examples of organizational factors such as organizational structure and culture and managing change.

**ORGB 2200 Organizational Behavior I** — Introduces the human side of the enterprise. Studies human behavior 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 behavior: 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 Organizational Behavior 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.

**ORGB 2510 Interpersonal Relationships** — Explores the importance of harmonious relationships and the skills and methods for achieving them. Broadcasting involves unusually close interaction among its participants who work together to provide information, entertainment and revenues.

**ORGB 5600 Managing Change** — Looks at further analysis of human behavior in the organization towards development of models in the decision-making process. The extended analysis will encompass the development of organizations toward open systems capable of effective responses to change. Prerequisite: Admission to the ASTB Program.

## PETROLEUM

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**PETR 1101 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 Properties of Reservoir Fluids** — Introduces the chemical composition and physical properties of natural gas and crude oil, and the phase behavior these fluids exhibit during production from a reservoir. Some elementary applications of reservoir flow characteristics are considered.



**PETR 1308 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 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 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 Computer Simulation and Control** — Presents a course in basic computer simulation and control techniques. Emphasis is 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 3300 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 3306 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 students with 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. Students are required to evaluate three oil and gas properties as the final project. Prerequisites: PETR 2201 and 2202 or with department approval.

**PETR 3307 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 4403 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 and a final, formal technical report at the end of the course. Topics include system dynamics, response time, control strategies, system optimization, system modeling, flow charting, transducer and control valve evaluation. Prerequisite: MATH 2471 and CHSC 3341 or with department approval.

**PETR 4406 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 dewpoint 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 or with department approval.

**PETR 4407 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.

## PHYSICS

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**PHYS 0309 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 one-third 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

**PHYS 1140 Applied Physics for Building I** — Designed to meet the specific needs of Building Engineering 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 1141 Physics: Chemical Sciences and Biotechnology I** — Covers a wide range of physical principles, with special relevance to food sciences technology. First term topics include kinematics, dynamics, friction, statics, energy, power, circular motion, properties of solids, fluids and fluid.

**PHYS 1142 Physics for Civil and Structural I** — Includes 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.

**PHYS 1143 Physics for Electronics I** —

Presents general level course about physical quantities, their properties, relationships, and connecting principles. Translational and rotational motion (cause, mechanical energy, power) are studied, as well as simple harmonic motion, oscillators, waves, thermal energy, and heat. 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 1145 Physics for Food Technology I**

— Introduces a wide variety of physical principles emphasizing the applications of physics which are relevant to Food Technology. Develops skills in handling equipment, and the recording and reporting of data and results. Topics include kinematics, dynamics, work, energy, circular motion, and hydro statics.

**PHYS 1146 Physics for Wood Products I**

— 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 1147 Physics for Mining/**

**Petroleum I** — 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 1151 Physics for Surveying I** —

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 1162 Physics for Plastics**

**Technology** — Deals with basic concepts in linear and rotational kinematics/dynamics, electricity and magnetism. General problem-solving skills are emphasized and concept applications are discussed. Data acquisition and analysis are stressed in the laboratory.

**PHYS 1164 Physics for Robotics I** —

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.

**PHYS 1178 Physics: Biomedical Engineering**

— Presents a general level course in basic physics with emphasis on applications. The topics are electric and magnetic fields, mechanics, waves, and fluids, with related applications.

**PHYS 1272 Physics: Medical**

**Radiography I** — 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.

**PHYS 1274 Physics for Nuclear**

**Medicine I** — Reviews units and energy and describes nuclear physics topics including atomic structure, X-rays, nuclear structure, nuclides, measures of radioactive decay, radioactive decay and modes of decay.

**PHYS 1282 Environmental Health Physics**

— Emphasizes concepts, language and problem-solving. The goal is to provide the student with an appreciation of basic physics in areas which relate to environmental health. These areas include soils and hydrogeology, water and sewage treatment, food preservation, air quality and human comfort, sound and noise, light and illumination, and nuclear radiation exposure. Prerequisite: MATH 1821.

**PHYS 1284 Physics: Prosthetics and**

**Orthotics** — Emphasizes biomechanics applications in prosthetics and orthotics. 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.

**PHYS 1288 Applied Physics I for OCHS** —

Studies basic physical principles and applies them to relevant situations in the OCHS technology. Topics include kinematics, vectors, dynamics, statics, friction, energy, and simple machines. The labs emphasize measurement, data analysis, and experimental techniques as they relate to the lecture material.

**PHYS 2140 Applied Physics for Building 2**

— Designed to meet specific needs of the Building Engineering Technology. There is a lab component that includes 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.

**PHYS 2141 Physics: Chemical Sciences and Biotechnology 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.

**PHYS 2142 Physics for Civil and**

**Structural 2** — See PHYS 1142. Prerequisite: PHYS 1142.

**PHYS 2143 Physics for Electronics 2** —

A continuing non-calculus course dealing with concepts in electrostatics, electrodynamics (elementary), magnetism, magnetic materials, LR circuits, geometrical optics (as it relates to fiber optics), electromagnetic waves, poynting vector diffraction and interference of waves and relevant concepts of modern physics as they apply to solid state devices. The accompanying laboratory program emphasizes measurement, data analysis and experimental techniques as they relate to lecture materials. Technological applications are identified throughout the course, where appropriate. Prerequisite: PHYS 1143, or equivalent.

**PHYS 2145 Physics for Food Technology 2**

— Continues from PHYS 1145 with an emphasis on relevant physics principles and their applications. It reinforces and extends skills acquired in PHYS 1145. Topics include temperature, heat, thermodynamics, light, color, geometric and physical optics, electricity and magnetism. Labs emphasize measurement, data analysis, experimental techniques and report writing. Prerequisite: PHYS 1145.

**PHYS 2146 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 elementary 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 applications of all concepts presented. The accompanying laboratory program builds on report writing skills and emphasizes measurements/data analysis. Prerequisite: PHYS 1146.

**PHYS 2147 Physics for Mining/**

**Petroleum 2** — Covers behaviors of fluids, thermal properties of matter, waves, electricity, magnetism, electromagnetism and radio activity. The lab component is comprised of experiments to complement the lectures. Prerequisite: PHYS 1147.

**PHYS 2149 Physics for Mechanical**

— Presents a general-level course covering the elements of wave motion, sound, light, basic electricity and magnetism. Prerequisite: MATH 1491.

**PHYS 2151 Physics for Surveying 2**

See PHYS 1151. Prerequisite: PHYS 1151.

**PHYS 2164 Applied Physics 2 for**

**Robotics** — Emphasizes topics of special relevance to robotics. Part 1: Semiconduction physics including the theory of operation of diodes. Part 2: magnetism and electromagnetism with applications to robotic pickup systems and stepper motors. Part 3: thermal energy and thermodynamics. Part 4: advanced mechanics with special emphasis on mechanical properties of matter, 3D force systems, stress and vibration. Prerequisites: PHYS 1164, MATH 2342\* (\*may be taken concurrently).

**PHYS 2272 Physics: Medical**

**Radiography 2** — Continues on from PHYS 1272. The course emphasizes applied physics in Medical Radiography from a conceptual view. Topics include DC circuits, magnetism, magnetic induction, transformers, AC power, solid state, radiation, X-ray generators, X-ray production. Prerequisite: PHYS 1272.

**PHYS 2274 Physics for Nuclear**

**Medicine 2** — Continues the basic nuclear physics begun in PHYS 1274. Starts with a description of radiation interaction with matter and nuclear reactions. A foundation for instrumentation is made by covering static electricity, DC electricity, magnetism, and AC electricity. Instrumentation topics include a detailed study of scintillation detectors and an introduction to gamma cameras. Prerequisite: PHYS 1274.

**PHYS 2279 Physics for Electroneuro-**

**physiology** — Emphasizes various basic physics principles and their application to the ENPY Technology. Topics covered measurement theory with emphasis on graphical analysis and interpretation and computer applications; static electricity including electric fields, artifact generation, and safety considerations; physics of various transducers (Piezoelectric, Thermistors, Strain Gauges, and Thermocouples), including the construction, theory of operation, and application to ENPY technology; and, electromagnetics, with emphasis on induction. Theoretical derivations are not stressed.

**PHYS 2288 Applied Physics 2 for OCHS**

— Covers areas of fluids, thermal physics, vibrations, waves and electricity, as well as light and properties of radiation. Topics in fluids include fluid pressure, buoyancy, and fluid dynamics. Topics in thermal physics include kinetic theory of gases, specific and latent heat, thermal expansion, and heat transfer. Vibrations and waves covers types of simple vibrations, waves, standing waves and resonance and sound. Topics in electricity include DC and AC circuits and electrical safety. Particular attention is paid to the importance and interpretation of noise measurements in the workplace. Prerequisite: PHYS 1288.

**PHYS 3150 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.

**PHYS 3274 Physics for Nuclear**

**Medicine 3** — Continues the instrumentation work begun in PHYS 2274. Consists of a detailed study of gamma cameras including collimators, the camera head, addressing, uniformity, spatial resolution and image contrast, sensitivity and resolving time. Prerequisite: PHYS 2274.

**PHYS 4274 Physics for Nuclear**

**Medicine 4** — Completes the instrumentation work begun in PHYS 2274 and 3274. Includes an introduction to computers, emission tomography (SPECT and PET) gas filled detectors, and other detector type not previously discussed. Prerequisite: PHYS 3274.

**PHYS 5273 Physics of Ultrasound 1**

— 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, and acoustic power measurements.

**PHYS 6273 Physics of Ultrasound 2**

— Continues from PHYS 5273. Course topics include Doppler instrumentation and Doppler applications, biological effects and quality control. Prerequisite: PHYS 5273.

## PLASTICS

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**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 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 FFR 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 3320 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 3340 Plastics Design** — Focuses on injection molds and part design, sizing of mold analysed components as well as their function, care and maintenance. 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 3445 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.

**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 an introduction into job and part cost determination is also included. 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.

## PROSTHETICS/ORTHOTICS

**PROR 1100 Prosthetics and Orthotics I** — 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 1402 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 labor relations will be covered, with examples drawn from actual prosthetic/orthotic facilities. The ethical and legal concerns of a health care professional will also be presented.

**PROR 2200 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 2220 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 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. Prerequisites: PROR 2200, 2220, BHSC 2210, 2211.

**PROR 3300 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 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 analysed 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 4330 Practicum** — See PROR 2230. Prerequisites: PROR 3300, BHSC 3310.

**PROR 4400 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 3320.

**PROR 4410 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.

**PROR 4420 Case Studies** — Gives students the opportunities, under the guidance of practising Certifiees, 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.

**PSYCHOLOGY****PSYC 1101 Introductory Psychology 1** —

Begins two introductory courses focusing on the psychologist's approach to problems and issues in contemporary psychology. Current research on the nature of psychology, biological aspects, psychological development, sensation, perception, consciousness, learning, memory, thought, and language is covered.

**PSYC 1102 Introductory Psychology 2** —

Continues from PSYC 1101. Focuses on the psychologist's approach to problems and issues in contemporary psychology. Current research on basic motives, emotions, health psychology, intelligence, personality, abnormal behavior and therapy, social cognition, social interaction and influence is covered.

**RENEWABLE RESOURCES****RENR 1105 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, measuring tree heights and calculating volume, browse surveys for wildlife and an introduction to defects in trees. Emphasis is on field labs with supporting lectures.

**RENR 1110 Microcomputer Applications (Forestry option)** —

Introduces various computer applications in resource management. Includes a review of computer hardware, software and operating systems. Assignments from other program courses will be used to introduce students to general word processing, spreadsheet, database management and file management skills. Students will also prepare a report involving the integration of word processor and spreadsheet tools to present statistical information.

**RENR 1120 Photo Interpretations and Mapping 1** —

Presents the practical use and application of aerial photography and maps for natural resources management. Classification, navigation, reconnaissance, planning and inventory using aerial photos. Practice in the use of stereoscopes. Construction and interpretation of maps and plans. Transfer of detail between aerial photos and maps. Students will also be introduced to basic CAD principles using Microstation.

**RENR 1150 Ecology, Plants, Soils 1** —

Provides an opportunity to develop an understanding of ecosystem components and management of ecosystems in B.C., learn to understand and use the Biogeoclimatic Ecosystem Classification system, develop competency in site diagnosis, use Regional Field Guides and become familiar with the appropriate Forest Practices Code Guidebooks. Plants and their identification will focus on structure, physiology, taxonomy and indicator value of plants in ecosystems. Plant (emphasis on trees) reproduction, distribution and ecological significance will be covered. Ecosystem based plant collections will be required. Soils will emphasize the development and classification of soils in an ecological context. The student will learn to interpret climate, site, vegetation and soil processes for ecosystem management. Forest Practices Code requirements for using soil knowledge will be examined and practiced. Both the engineering and plant growth aspects of soils will be developed.

**RENR 1166 Integrated Resource Management 1** —

Introduces the resource sectors in B.C. including fisheries, forestry, recreation/tourism, mining, water resources and agriculture. History and current issues in integrated resource management will be presented. Topics include, government agencies, administrative framework, First Nations, the Forest Practices code and basic issues in silviculture, engineering and environmental monitoring.

**RENR 1200 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; 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 practised. 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 2116 Applied Ecology in B.C.** —

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: Completion of level 1.

**RENr 2135 Fire Management I —**

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 behavior, 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.

**RENr 2141 Photo Interpretation and Mapping 2 —**

Continues from RENr 1120, with an emphasis on interpreting surficial materials, vegetation identification, and the use of aerial photos and other imaging. Students will transfer aerial photo information to a digital format using monorestitution software. Prerequisite: RENr 1120, and MATH 1451 or 1452.

**RENr 2150 Ecology, Plants, Soils 2 —**

Provides students with an opportunity to develop an understanding of ecosystem components and management of ecosystems in B.C., learn to understand and use the Biogeoclimatic Ecosystem Classification system, develop competency in site diagnosis, use Regional Field Guides and become familiar with the appropriate Forest Practices Code Guidebooks. Plants and their identification will focus on structure, physiology, taxonomy and indicator value of plants in ecosystems. Plant (emphasis on trees) reproduction, distribution and ecological significance will be covered. Ecosystem based plant collections will be required. Soils will emphasize the development and classification of soils in an ecological context. The student will learn to interpret climate, site, vegetation and soil processes for ecosystem management. Forest Practices Code requirements for using soil knowledge will be examined and practiced. Both the engineering and plant growth aspects of soils will be developed. Prerequisites: RENr 1105, 1110, 1120.

**RENr 2156 Forest Management —**

Develops the two central ideas of Forestry Management: ecosystem management and people management, with particular relation to the Forest Practices Code. Ecological processes will be reviewed and integrated so that the student will understand the reasons behind the Forest Practices Code Regulations.

**RENr 2166 Integrated Resource**

**Management 2 —** Continues from RENr 1166 to develop an understanding of issues in resource management with emphasis on such themes as environmentalism, "New Forestry", economics of resources, managing for sustainability, research, and computer modeling. Social and political issues including conflict resolution, changes to legal aspects of management, ethics and resource professions will be introduced. A technical report is required. Prerequisite: RENr 1166.

**RENr 2240 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. 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 2990 Cooperative Education Work**

**Term I —** 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 and 2 completed with a minimum cumulative average of 65 per cent.

**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.

**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 residue procedures and techniques are practised. Provides a framework to integrate, utilize and practise 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.

**RENr 3135 Fire Management 2**

**(Forestry) —** Focuses on forest land management through an understanding of fire management. Main topics are fire ecology, fire behavior 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 2116, 2135, COMM 2245. Enrolled in: RENr 2155, 3145.

**RENr 3145 Silviculture I —** Begins with the basics of forest management, site productivity, stocking, growth and yield 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 Forest Insects and Diseases I**

— Presents an ecologically based study of insects and diseases of concern in B.C. and their impact on forest health. Includes recognition and identification of currently important organisms as well as the symptoms and damage they produce. Life cycles of the more important organisms and the significance of those life cycles in terms sampling and forest management practices. Prerequisite: Completion of all 1st year RENr courses.

**RENr 3155 Forest Management 2 —**

Prerequisite: RENr 2155.

**REN 3160 Forest Engineering I —**

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.

**REN 3165 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 be able 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.

**REN 3166 Computer Applications for Forestry — None.****REN 3175 Independent Studies —**

Occupies two weeks following final exams at the end of second year. Students work in the field with a supervisor on a resource management project or course. It provides an opportunity to obtain special work experience beyond that provided in the usual course of studies. 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.

**REN 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. Prerequisite: Completion of all first-year courses or permission from the instructor.

**REN 3181 Technical Project 2 (Forestry)**

— Continues from RENR 3180. The final results of the project will be documented in a formal Term 4 report that will account for a significant portion of the mark for this course. Prerequisite: Completion of RENR 3180.

**REN 3190 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 I.

**REN 2990 Co-op Work Term I —**

*Under development.*

**REN 3215 Recreational Land Management I —**

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 and eco-tourism opportunities including operation of hunting and fishing camps, guided hikes and commercial rafting companies. Prerequisite: First year of the program.

**REN 3220 Wildlife Management I —**

Covers the principles and practice of wildlife management, with particular reference to problems and procedures in B.C. 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.

**REN 3225 Fish Management I —**

Covers the biology of B.C. fish including anatomy, taxonomy, physiology, behavior and ecology. Management of fisheries including population dynamics, habitat evaluation and improvement, harvesting, pollution and fishery regulations. Labs deal with methodology as it applies to the above and much of the training will be done in the field. Emphasis throughout is on the B.C. situation. Prerequisite: First year of the program.

**REN 3230 Projects I FWR —**

Allows students to conduct 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.

**REN 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 2990.

**REN 4107 Natural Resource Measure-**

**ments 4** — Covers logging residue and waste procedures (how to measure, what to measure), an overview of the manufacturing process of logs (includes a field trip to a manufacturing plant), and a short in-depth session on log scaling and grading procedures. Prerequisites: RENR 3107.

**REN 4145 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 Forest Insects and Diseases 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 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 4166 Applied Forest Management** — Focuses on the practical application of resource management skills learned in the previous resource management courses. Assessing and mapping terrain, sensitive areas and ecosystems will be completed. Landscape management and watershed assessment and restoration principles will be developed. A Forest Development plan in compliance with the Forest Practices Code will be prepared.

**RENR 4215 Recreational Land Management 2** — Continues from RENR 3215. Prerequisite: RENR 3215 or instructor's approval.

**RENR 4220 Wildlife Management 2** — Continues from RENR 3220. Prerequisite: RENR 3220.

**RENR 4225 Fish Management 2** — Continues from RENR 3225. Prerequisite: RENR 3225.

**RENR 4230 Projects 2 FWR** — Continues from RENR 3230. Prerequisite: RENR 3230.

**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 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.

**RENR 5001 Natural Resource Business Administration** — Introduces students to business fundamentals that are needed to function in modern day natural resource administration. Basic accounting, including balance sheets and income statements; basic business law, including incorporation, contract law, and liability; insurance; financing of public and private ventures; are covered. Preparation of business plans for private (e.g., a ski area) and public ventures (e.g., FRBC project) are reviewed. Marketing of professional/technical services and development of technical proposals and terms of reference are presented and discussed.

**RENR 5002 Forest Practices Auditing** — Covers general purposes, principles and procedures of auditing. Different kinds of auditing (financial, industrial forest practice audits, ISO, and forest practice audits under the Forest Practices Code of B.C. FPC) are surveyed. Details of forest practice auditing under FPC are presented and discussed. Examples of various audits are presented and discussed using case studies and other true-to-life examples. The emphasis of the course is to introduce students to forest practices auditing so they will know procedures and general responsibilities under FPC. More specifically, students will know their responsibilities when being audited.

**RENR 5010 Integrated Resource Planning** — Introduces students to forest planning as an instrument of natural resource policy, surveys the history of forest planning in British Columbia, and describes, in detail, strategic and operational planning under the Forest Practices Code of British Columbia (FPC). Legislation and policy affecting forest planning is reviewed. Examples of strategic level planning covered include CORE and Land and Resource Management Plans (LRMP), TSA Management Strategies, TFL Management Plans, Local Resource Use Plans (LRUP), Total Resource Plans (TRP), Resource Management Zones, and Landscape Units. Examples of operational planning include Forest Development Plans, Logging Plans, Silviculture Prescriptions, Stand Management Prescriptions, 5 Year Silviculture Plans, Access Management Plans, and Range Use Plans. The relationships between various plans and their role in monitoring performance and FPC compliance will be emphasized. Examples of some real plans will be reviewed and discussed.

**RENR 5100 Riparian Management Area Guidebook Course** — Provides direction on planning forest operations within Riparian Management Areas (RPA's). This course will cover riparian classes, boundary setting, and best practices within RMA as recommended in the Riparian Management Area Guidebook. The course will provide a balance between classroom, field and case studies on riparian management and forest practices.

**RENR 5102 Project Management/Resource Utilization** — Focuses on effective project management brought about through teamwork. Teams will plan a project, providing an opportunity to experience the project management process and see its effectiveness first-hand. Emphasis will be placed on effective, motivated teamwork, and good time and cost control. Only one of RENR 5102 or TMGT 7102 may be taken for credit.

**RENR 5200 Urban Watershed Restoration** — Explores some of the current environmental management issues, approval requirements and initiatives by local governments associated with land development adjacent to watercourses in urban watersheds. Day one will focus on the Land Development Guidelines and other current approval requirements/processes required when conducting projects associated with watercourses. Day one will also provide an overview of some of the current management issues and initiatives by local governments to protect watercourses and better manage urban watersheds. Day two will involve a field trip to a variety of example sites throughout the Lower Mainland where local governments have incorporated restoration and enhancement projects to better manage and protect aquatic habitats.

**RENR 5300 Multi-Cultural Awareness Training** — Provides intercultural training in the hope of achieving a cross cultural understanding in resource management. This course covers topics in the following areas: cultural encounters, aboriginal peoples, introduction to immigrant groups, South East Asian peoples, South Asian peoples, and Black peoples. We all have a commitment to the careful management of our renewable resources. This task is impossible without the cooperation and support of those whose culture and livelihood is dependent on these resources.



**RENR 5310 Integrated Resource Project**

— Designed as an applied practical project that may be sponsored and evaluated by industry. Working as a group, participants will develop prescriptions for an environmental project that requires the use of multiple resource management skills and knowledge. Participants will work with an actual resource management project and be required to develop effective and sound management or restoration prescriptions. Participants will be required to demonstrate effective project management skills by delegating tasks and responsibilities to group members; a sound understanding of resource management to develop appropriate, cost-effective solutions; and a clear understanding of the processes required to implement the solutions. Participants will be required to make a final presentation to the project sponsor and staff.

**ROBOTICS**

**ROBT 1270 C Programming** — Introduces modern programming practices with emphasis on structured programming, modularization and the top-down approach to problem-solving. The C programming language is used to solve engineering problems.

**ROBT 3341 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. Prerequisites: PHYS 2163, ELEX 2125, MECH 2210. Corequisites: MATH 2341, MECH 2356.

**ROBT 3351 Automation Equipment** —

Covers the basic principles of generators and the construction, speed-torque characteristics, braking conditions and speed control of permanent magnet DC motors. Also covers operation and control of brushless DC motors and stepper motors. Prerequisites: ELEX 2105/2115, PHYS 2163, MATH 2341. Corequisites: ELEX 2120, ROBT 3351.

**ROBT 3416 Computer Integrated**

**Manufacturing for Robotics** — Teaches the use of a microcomputer based CAD/CAM system. Programming the operation of CNC machine tools using the manual and computer assisted methods. Also investigates the integration of computer aided design and manufacturing. Prerequisites: MECH 1210, MECH 1104.

**ROBT 3356 Controller Systems** —

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. Prerequisites: ELEX 2125/2115. Corequisites: ELEX 2120.

**ROBT 4451 Sensor Interfacing** —

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. Prerequisites: ROBT 3351/3356, ELEX 3321.

**ROBT 4455 PLC Applications for**

**Robotics** — Presents descriptions of components in a programmable logic controller (PLC). Create ladder logic diagrams and use high level software for programming a PLC. A selection of hardware components-sensors and actuators are interfaced to the PLC. Prerequisite: ROBT 1270, ELEX 1205, ELEX 2220.

**ROBT 4491 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. Prerequisites: Must be completed concurrently with, or after completion of, all other level 4 courses.

**SUVEYING****SURV 1120 Surveying for Building** —

Introduces measurements; electronic distance measuring devices; angular measurements; theodolites; differential and trigonometric leveling; GPS; surveying procedures in high-rises; traverses; triangulation; trilateration; elementary computations; coordinate systems, cadastral plans in British Columbia.

**SURV 1128 Surveying for Petroleum** —

Covers fundamental concepts and basic principles of surveying; familiarization and use of levels, chains and theodolites; differential leveling, peg-test, field note keeping and note reductions; linear measurement; angles, directions, bearings; angle measurements; coordinate systems; traverse computations and area calculations; practical projects in leveling and angle measurements.

**SURV 1130 Surveying for Civil and**

**Structural** — Covers fundamental concepts and principles of surveying; datums, principle of differential leveling, bench mark and detail leveling, peg-test, grades, use of levels, theodolites and steel chains; linear measurements; angle measurements and reductions, directions, bearings, coordinate systems; traverse computations, inverse, area calculations; field note keeping and reductions; care, maintenance and adjustment of equipment.

**SURV 1140 Surveying for Mining I** —

Introduces surveying dealing with general types of surveys and basic definitions. Focus on field and office procedures for differential leveling to establish elevations and using the theodolite and tape for determining horizontal location. Computational operations for processing survey data including traverse and level loop reductions and adjustments. Sources of error and blunders will be introduced. Emphasis will be placed on presenting survey information in an industry standard format.

**SURV 1161 Surveying Computations I** —

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; inverting; computations of traverses; traverse adjustment by compass rules; locations of gross linear and gross angular errors; area computations by coordinate methods; missing parts.

**SURV 1164 Field Surveying I —**

Introduces 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 Drafting and Cartography —**

Covers 2D and 3D Cartesian coordinate systems; geometry of orthographic and perspective projection; tools for manual drafting; lettering; use of scales; determination of area and volumes; geometric constructs; conventions for contouring and topographic mapping; reproduction methods for plans and maps; elementary descriptive geometry.

**SURV 1172 Computer Applications I —**

Familiarizes students with operation of the hand held computer from two perspectives: as a calculator to do typical computations 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 2230 Surveying for Civil and**

**Structural 2 —** Covers computations and adjustments of integrated traverses; triangulation, trilateration and intersection; trigonometric leveling; horizontal curves; road and building layout; cut and fill, areas of cross-sections, volume calculations; introduction to the total station; detail survey. Prerequisite: SURV 1130.

**SURV 2240 Surveying for Mining 2 —**

Continues from SURV 1140. The content is the same. Prerequisite: SURV 1140.

**SURV 2260 Computational Methods for the Field Technician —**

Reviews important geometry theorems and their application to survey. Computations of simple circular curves and symmetrical vertical curves. Solution of problems related to the subdivision of land. Reduction of field acquired measurements. Prerequisite: SURV 1161.

**SURV 2261 Surveying Computations 2 —**

Covers open and closed traverses and the determination of errors, transformation of coordinates, subdividing land of specific requirements, introduction to the geometry of the simple circular curve, computation of data for layout of circular curves by various methods, computation of compound and reverse curves - elements and layout, subdividing land that includes curved boundaries, computation of symmetric vertical curves - elements and layout, slope staking using a level, slope staking with a total station, resection - by angle measurement calculation of areas of cross-sections and earthwork volumes, calculation of earthwork, volumes of large areas. Prerequisite: SURV 1161.

**SURV 2263 Earth Sciences —** Presents a study of the forest flora of British Columbia. 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 Field Surveying 2 —** Covers UTM traverse and computations; different field methods of angle measurements; trigonometric leveling; topographic surveys by various methods and instruments; road location; cuts and fills; setting out circular curves; building site layout; and, total stations. Prerequisite: SURV 1164 and 1161.

**SURV 2265 Surveying CAD I —** Enables students to apply computer aided drafting fundamentals to the solution of surveying problems. Coordinate geometry routines will be introduced that cover typical land surveying applications. Emphasis will be placed on preparing plans which meet industry format standards. The software for the course will be RAPID TRANSIT a popular program in the surveying profession within British Columbia. Prerequisite: SURV 1165 or CIVL 1001.

**SURV 2267 Photogrammetry I —**

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 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 practise in the use of surveyor's levels, and total stations. Prerequisite: SURV 1164.

**SURV 2272 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 3330 Surveying for Civil and**

**Structural 3 —** Covers field procedures for pick-up and layout of points. Operation of levels, theodolites and total stations. Field note reductions. Calculations involving two and three dimensional coordinates, grades, areas, and volumes. Office and field procedures to position points by triangulation and trilateration. Prerequisites: SURV 2230.

**SURV 3340 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 3361 Surveying Computation 3 —**

Covers reductions of field measurements; field consistency checks on angles and distances; theory and propagation of errors; eccentric measurements; computations of positions of control points, triangulation, trilateration, traversing, intersection and resection; inaccessible base; curvature and refraction corrections; trigonometric leveling; transformation of coordinates. Prerequisite: SURV 2261.

**SURV 3362 Geodetic Surveying I —**

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 leveling, orthometric and dynamic heights. Prerequisite: MATH 2511.

**SURV 3363 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 Field Surveying —**

Emphasizes the use of total stations with a range of industry standard data collection systems. Specific field projects will include a horizontal control net on Seymour Mountain. An underground demonstration survey at Britannia Beach Mine along with a variety of topographic and as-built projects on the BCIT campus. These projects typically will result in a "final plan" produced through software into a "laser" plot. An introduction to astronomic observations for azimuth and the use of precise levels will also be included. Prerequisites: SURV 2261, 2264 and MATH 2511.

**SURV 3365 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 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 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 Computer Applications 3 —**

Teaches 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 3378 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 3576 Global Positioning System —**

Describes the GPS system, definitions and vocabulary, details of the satellite signals — C/A code, P code, Y code, navigation message, L1 and L2 carrier phases; datums, discussions of positioning modes-point, differential, real time, post-processed; discussion of types of field GPS - static, quick static, semi-kinematic, kinematic and on-the-fly; factors contributing to range errors; field data collection, post-processing of field data and explanation and interpretation of computer print-outs; quality analysis of GPS results; computation of number of observations, unknowns, and degrees of freedom for carrier phase; fixed and free network adjustments and statistical evaluation of results. Prerequisite: SURV 3362, SURV 4462.

**SURV 4430 Surveying for Civil and**

**Structural 4 —** Covers office calculations involving bearing-bearing, bearing-distance, and distance-distance intersections. Highway design and layout involving route location and parallel offset calculations; simple circular curves, compound and reverse curves, vertical curves and transition spiral curves; slope staking with a level and with a total station; computation of volumes; application of GPS. Prerequisite: SURV 3330.

**SURV 4440 Surveying for Mining 4 —**

Continues from SURV 3340. The content is the same. Prerequisite: SURV 3340.

**SURV 4461 Surveying Computations 4 —**

Covers horizontal curves; vertical curves; numerical methods of solutions of complex nonlinear problems; transition curves; partitioning of land; precise leveling; Pappus theorem on area and volume calculations along circular roads; slope staking; three-dimensional surveying systems. Prerequisite: SURV 3361.

**SURV 4462 Physical Geodesy —**

Introduces the concepts of physical geodesy and includes the following topics: horizontal and vertical datums; gravitation and centrifugal forces; measurements of gravity and reduction of gravity, gravity anomalies, separation of the geoid and ellipsoid, deflection of the vertical; orthometric and dynamic heights.

**SURV 4464 Field Surveying 4** — Focuses on field procedures for route location preliminary design and layout, cadastral and hydrographic surveys. GPS equipment will be introduced for use in both GIS and survey control projects. Emphasis will be on accomplishing common tasks with different equipment and approaches. Hydrographic and cadastral field projects will attempt to demonstrate techniques common to typical situations. Producing a 'final' product in terms of a plan will be an end result to many of these field labs. Prerequisite: SURV 3364.

**SURV 4465 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 4468 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 Planning and Land Utilization** — Focuses on the planning process as it applies to regional and community planning. A brief history of urban planning will be included along with an introduction to models that have been used in urban planning studies. The role of various planning authorities, their powers and legislation affecting planning will be introduced along with zoning and its implications for land use and land development. Land use studies from a surveyor's perspective with regard to the subdivision of land and elementary economics related to land development are discussed. Prerequisite: SURV 3367.

**SURV 4472 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 tunneling. Prerequisite: 3364.

**SURV 4475 Introduction to Remote Sensing and Photo Interpretation** — Includes the electromagnetic radiation spectrum, interaction with matter, uses of various portions of the spectrum, the digital image; devices for capture of images, scanning systems, land sat images, digital image processing and creation of enhanced "false color" images; interpretation of stereoscopic of common landforms in B.C. interpretation of man-made features, equipment for use in interpretation.

**SURV 4480 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 modeling, 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.

**SURV 4663 Adjustment of Surveying Measurements I** — 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 post adjustment global and local tests. Prerequisites: SURV 2261 and MATH 3511.

## TRANSPORTATION/ INTERNATIONAL TRADE

**TDMT 1100 Learning Skills I** — Assists new International Trade and Transportation students in increasing their success at BCIT. The course covers skills in time management, project management, teamwork, and planning.

**TDMT 1101 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 1148 Industrial Engineering** — Under development.

**TDMT 1150 Distribution I (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 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 students with a set of base skills required by international firms. Prerequisite: Successful completion of third level.

**TDMT 1409 Introduction to Canada Customs and 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 2100 Team and Learning Skills 2** — Supports and enhances the development of teamwork and learning skills. The integration of teamwork skills, reinforcement and application of teamwork skills, personal success skills will be covered as they relate to the second level curriculum.

**TDMT 2203 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 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 2310 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 2403 Quantitative Methods** — Applies a practical, quantitative approach to solving transportation logistics problems. Topics include forecasting, scheduling, transportation models and queuing theory.

**TDMT 3204 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 Logistics I** — 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 4401 Logistics 2** — Adds 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 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 Intermodal Transportaion** — 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. Prerequisite: TDMT 2250.

**TDMT 3402 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 4306 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 analyse the competitive position of the carrier (employer), with emphasis on the current deregulated and competitive environment.

**TDMT 4401 Logistics 2** — Designed to provide the students with an understanding of the logistics planning and control process. Emphasis is placed on materials movement and storage in the context of total supply chain management focusing on cost trade-off, profitability, and productivity measures. The operational areas studied span customer service, transportation, inventory, order processing, warehousing, and material handling in both the domestic and international environment. The organization and administration of these functional areas is developed on an integrated basis leading to strategic positioning of a firm's logistical competency.

**TDMT 4411 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.

## TECHNOLOGY MANAGEMENT

**TGMT 7102 Project Management/Resource Utilization** — Focuses on effective project management brought about through teamwork. Teams each plan a project making use of the learning of the preceding sessions. This gives them the opportunity to experience the project management planning process and see its effectiveness first-hand. Emphasis will be placed on effective, motivated teamwork, and good time and cost control. 1 credit

**TGMT 7143 Problem-Solving and Decision-Making** — Deals with a practical, hands-on approach to problem-solving and decision-making using an analytical, process-oriented approach. Tools and techniques are used to better maximize the problem-solving and decision-making skills of the participant. 1 credit

## TOURISM

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**TOUR 1260 Issues in Tourism** — Examines the evolution, function and direction of tourism as applied in B.C. Group discussion, case histories and lecture formats. Topics include historical influences on tourism; basic components of community tourism; tourism terminology; time zone and currency issues; basic B.C. geography and travel industry conflicts; hospitality and tourism statistics, psychology of travel including allo-psycho segmentation; demographics of travel and acculturation; tourism event legacies; destination determination; educational issues for industry and for employees entering careers in tourism sectors.

**TOUR 2301 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 or 1261.

**TOUR 2900 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/labor/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 or 1261.

**TOUR 3320 Convention, Trade Show Markets** — Examines all planning involved in meetings and conferences. Topics include: program and speaker development; site and transportation selection; supplier negotiations; hospitality and delegate comfort; pre and post activities. Focus emphasizes market identification and effective promotion of the program. Incentive travel, and trade-consumer shows exhibitor and attendees. Market promotions and database identification are assessed. Students will be given opportunities to work with local business forums or projects. Prerequisite: TOUR 1260.

**TOUR 3324 Tourism Marketing Planning** — Presents a study of effective processes for generating product ideas and the development of a marketing plan. 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. Prerequisite: TOUR 1260, MKTG 1102.

**TOUR 3410 Special Events and Promotion** — Prepares students for the high-energy, growing opportunities in community special events and festivals, corporate, sports, non-profit, and fundraising activities. Planning and marketing of such events to generate gate interest, identity, and sponsorship are explored. A second emphasis is on development and correct use of press releases, media kits, public relations and communications strategies, and dealing with emergency situations involving media. Prerequisite: TOUR 1260.

**TOUR 3411 Passenger Transportation Marketing** — Covers competitive factors and regulatory change 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 3415 Resort/Hotel Marketing and Sales** — Principles of generic sales and marketing are applied specifically to the accommodations sector of Tourism. This course presents a variety of models for marketing a resort/hotel property considering upon size, markets attracted and location. Course emphasizes development of an annual marketing plan. Students will maintain a close contact with an accommodation property and will monitor techniques currently in use. Discussions will include the role of personal selling, sales reporting methods, communications and media used, and budget identification to effectively reach market goals and specified target groups. Prerequisites: TOUR 1260 or 1261; successful completion of all Level 1 and Level 2 courses.

**TOUR 3445 Cultural Tourism and Geography** — Prepares students to acknowledge visitors' traditions when serving them as hosts or when planning a marketing campaign to solicit greater numbers of visitors to British Columbia. The focus of this course will examine the unique characteristics of potential B.C. visitors. The course will begin by studying North American visitor segments, then consider all major international tourist markets. Students will identify potential cross-cultural/religious observances, gender relationships and body language, artistic expressions, and beliefs and behavior patterns.

**TOUR 4400 Development of Community Tourism** — Provides a foundation for 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. Other issues explored via case studies, brainstorming, and guest speakers will include: identifying symptoms of community and regional decline; strategies for economics diversification using tourism; respect for and promotion of indigenous cultures and sensitive ecological areas; methods of creating interactional balance between desires and needs of residents and visitors. A major group project encourages students to work with community planners and entrepreneurs, special interest groups, and area residents. Prerequisite: All level 3 courses.

**TOUR 4418 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: MKTG 2309.

## TECHNOLOGY TEACHER EDUCATION

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### **TTED 0699 Safety Across Tech Ed Curric**

— Instruction in safe work and materials handling practices is embedded in all TTED courses at BCIT. Opportunity exists throughout the Program for students to practice safe procedures and receive guidance while working in our labs. At the end of their program of TTE studies at BCIT, each student's knowledge of an ability to identify safe work procedures will culminate with them writing a comprehensive "Safety Across the Technology Education Curriculum" examination.

### **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. Design and planning procedures used in production; 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 that 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 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. Examines use of experiments and projects for teaching linear, digital and microprocessor materials and projects. Prerequisite: TTED 4260.

### **TTED 5371 Using Computers in Teaching 3**

— Covers advanced computer applications including installation and configuration of system hardware and software, optimizing software, and, adding and controlling 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 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 3100, TTED 3110, TTED 3120, 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.

## WOODS PRODUCTS

**WOOD 1101 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 Lumber Grading 1** — Given in Level 1 in preparation for Lumber Grading 2, 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 per cent pass mark. A COFI Certificate in Tallying is required to obtain the BCIT Diploma of Technology. Students must also obtain 50 per cent marks during the term of the course given at BCIT.

**WOOD 1104 Log Utilization** — Introduces basic log-scaling procedures used in coastal mills and includes different log-sorting methods and recovery calculations used in sawmill and plywood industries. Considerable time is spent practicing scaling techniques on selected log booms.

**WOOD 1201 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 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 per cent pass mark as a requisite to obtaining the BCIT Diploma of Technology. Students must also obtain the required 50 per cent term marks for the in-school portion of the course.

**WOOD 1203 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 behavior 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 Lumber Manufacture 1** — Examines 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 Plywood Manufacture** — Examines the methods and equipment used in the manufacture of plywood in the B.C. Coast and Interior. 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 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 Mill Management 2** — Continues from WOOD 2107.

**WOOD 3105 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 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.



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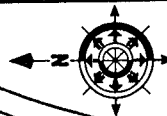
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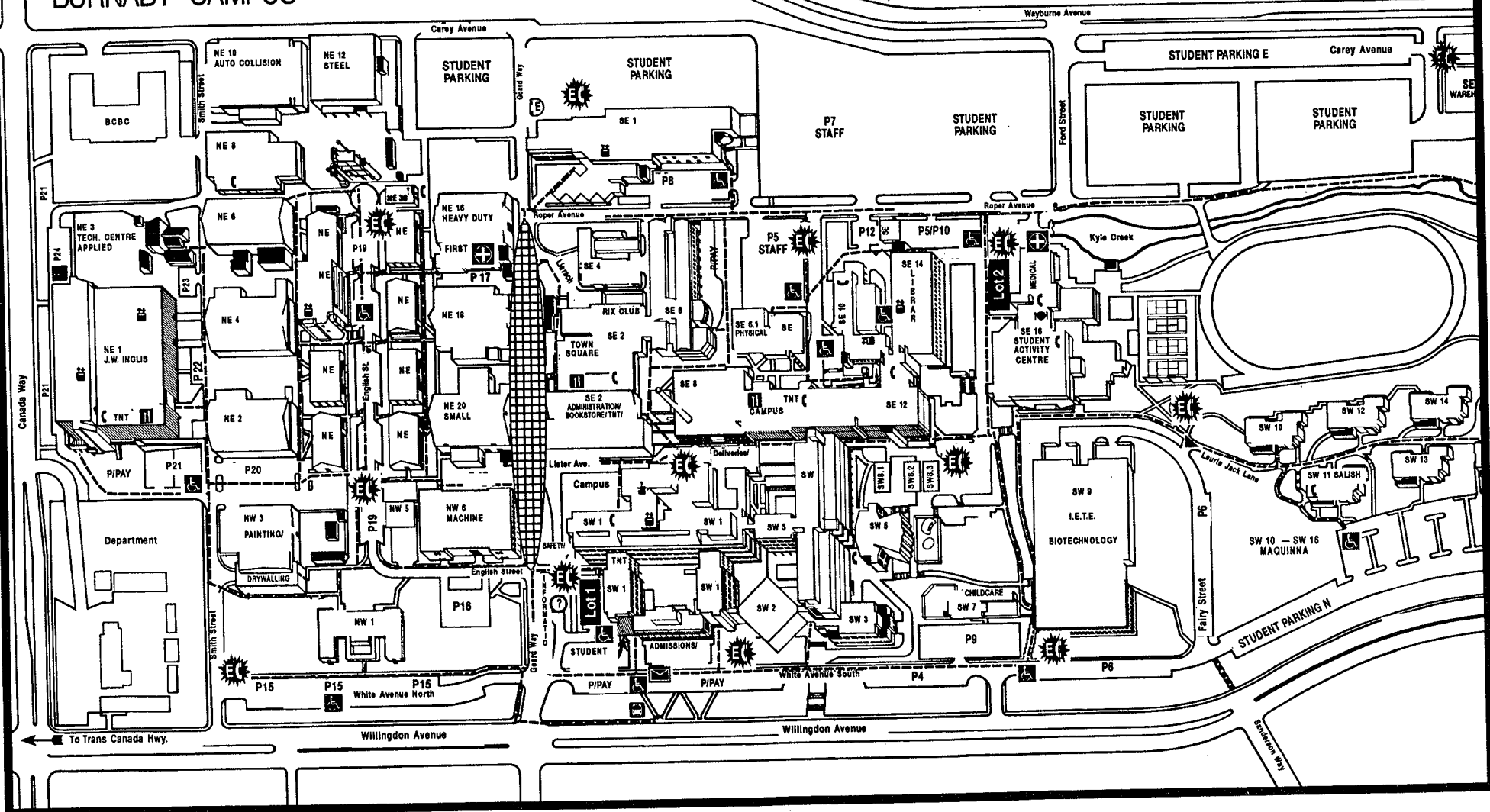
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# BURNABY CAMPUS

BRITISH COLUMBIA  
INSTITUTE OF TECHNOLOGY  
3700 Willingdon Avenue  
Burnaby, B.C., Canada



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.
5. Emergency Phone





# Application for Admission

## FULL-TIME AND BACHELOR OF TECHNOLOGY PROGRAMS

### 1 When to Apply

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<b>Bachelor of Technology Programs:</b>	Applications are accepted all year round.	
<b>Trades/Vocational Programs:</b>	Applications are accepted all year round.	
<b>Technology Programs:</b>	<i>Apply After:</i> October 1 June 1 January of the previous year September 1	<i>For Term Starting:</i> August/September January January: Medical Radiography 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 Registration and Information at (604) 434-1610 for program brochures and program information.
4. **Please attach a non-refundable application fee of \$30.** Please pay by cheque, money order, American Express, VISA or MasterCard. You can also pay by cash or debit card 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. Applications may also be made through the Internet at [www.bcit.bc.ca](http://www.bcit.bc.ca).
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

---

#### 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. Interim and final transcripts from the Ministry of Education may arrive at BCIT later than required. It is important that you submit your own copies of interim and final transcripts as soon as you receive them from your High School.

#### 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.


# **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 so that processing of your application can 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.
- 
- ☒ 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.
- 



## **Make sure you complete this checklist before you hand in your application!**

- ☐ Have you included either official or photocopied transcripts with your application?
-  **If you 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 application fee?
- ☐ Have you included any additional program requirements as indicated in the BCIT program brochure or calendar?

**BCIT Admissions Department  
3700 Willingdon Avenue  
Burnaby, B.C.  
V5G 3H2**



# Application for Admission

Full-time and Bachelor of Technology Programs

3700 Willingdon Ave. Burnaby, B.C. V5G 3H2 Phone: (604) 432-8419 www.bcit.bc.ca

## 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 on 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. ☐

Birthdate: DD MM YR

Sex: ☐ male ☐ female

Social Insurance Number  (For tax purposes only - Required for scholarships, bursaries & awards)

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\* ancestry? ☐ yes ☐ no

If yes, do you wish to receive information on services available to First Nations students? ☐ yes ☐ no

\*First Nations denotes status and non-status Native people, Metis and Inuit.

B.C. Examination or PEN number (Personal Education Number) if known

Disability Services Requested? ☐ yes ☐ no

Do you have any color blindness? ☐ yes ☐ no For more information, please contact The Educational Resource Centre for Students with Disabilities at (604) 451-6963.

Who should be contacted in case of an emergency?

Last Name  First Name

Relationship to you  Phone Number (  )  -

Is English your primary language? ☐ yes ☐ no If no, what is your primary language?

PERSONAL DATA

## HISTORY

Last Secondary School attended	Date		Grade completed	
	From:	To:		
Post Secondary School(s) attended	From:	To:	Years completed	Credential earned
Most recent employers (Attach resume if desired or required)	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: \_\_\_\_\_

**For Trades/Vocational programs, please make only one choice. For Technology programs you can make one or two choices. If you are applying for the ETE upgrading program (Engineering Technology Entry Program) as your first choice, you must also indicate the Technology program you desire to take afterwards as your second choice.**

Type of BCIT program desired: ☐ Technology ☐ Bachelor of Technology ☐ Trade/Vocational

**1<sup>st</sup> Choice:**

Program Name \_\_\_\_\_

**2<sup>nd</sup> Choice:**

Program Name \_\_\_\_\_

\*Option 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.

\* If a seat in my chosen program becomes available at the last minute for any given intake I wish to be contacted. ☐

Preferred start date: \_\_\_\_\_  
(month) (year)

Have you previously attended BCIT?

☐ yes ☐ no

ASAP ☐

For entrance into Level 

1	2	3	4
(please circle)	Year 1	Year 2	

**Most students begin at Level One. Students seeking advanced placement because of previous education can apply for Level Two or higher. More information can be found in BCIT's Full-time Calendar or by calling Registration and Information at (604) 434-1610.**

## 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 of 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 B.C. educational records database. The personal records in the database are not identifiable and are not used for administrative purposes. The purpose of the database 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. If granted an award, I authorize the Financial Aid and Awards Office to release pertinent information to the donor of the award and provincial funding bodies.

Signature \_\_\_\_\_

Date \_\_\_\_\_

## FEES

**A non-refundable \$30.00 application fee MUST be submitted with this form. You can pay by cheque, money order, American Express, VISA or MasterCard. Cash and debit cards are accepted in person only. A service charge for any NSF or returned cheque will be assessed. Applications received without the application fee will not be processed.**

☐ Visa

☐ MasterCard

☐ American Express

Card Number \_\_\_\_\_

Expiry Date \_\_\_\_\_

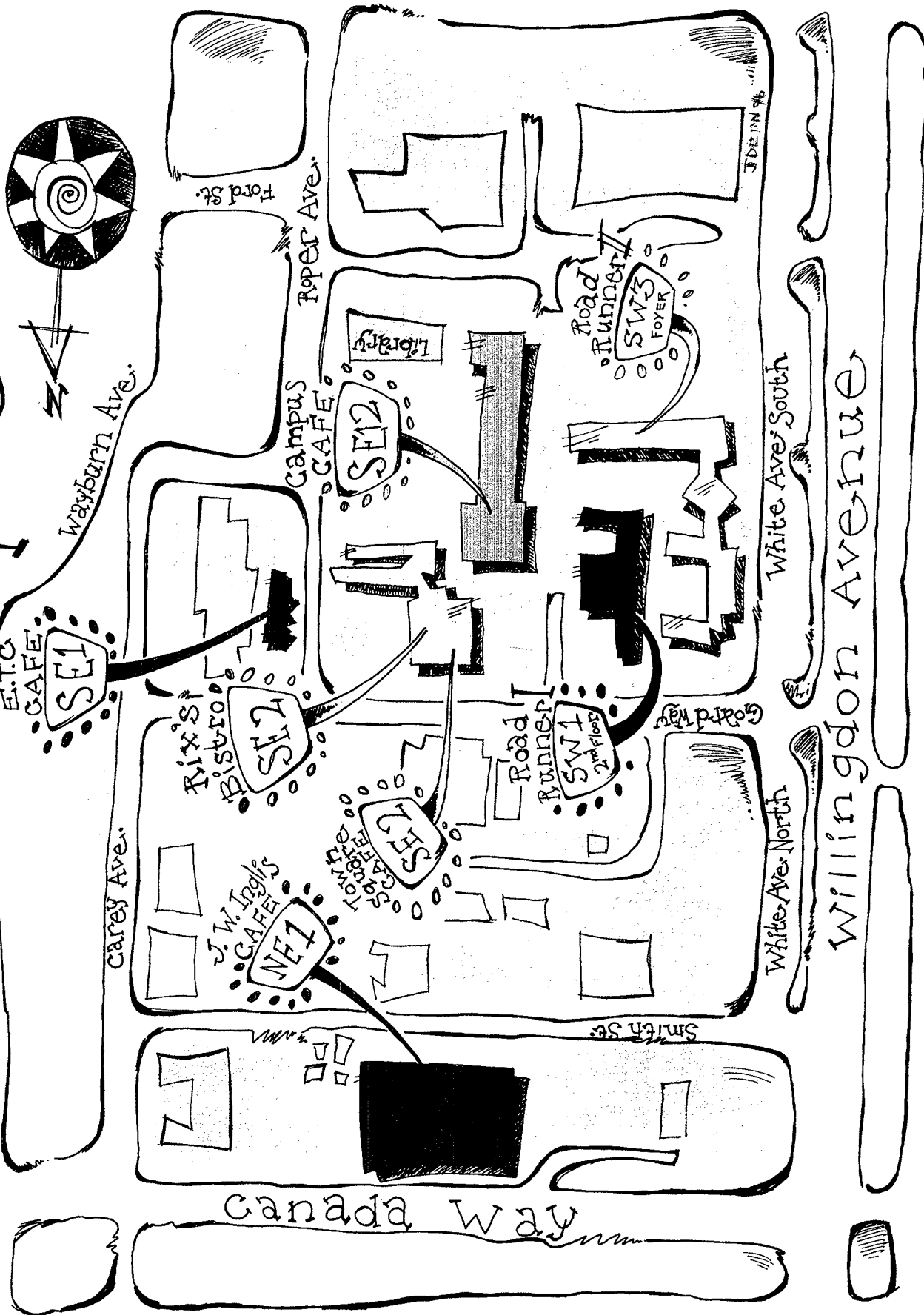
☐ personal cheque enclosed

☐ money order enclosed



# on campus

**BCH**





Their  
**Board.**

# O u r **Board.**

## CAREER CHECK LIST

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