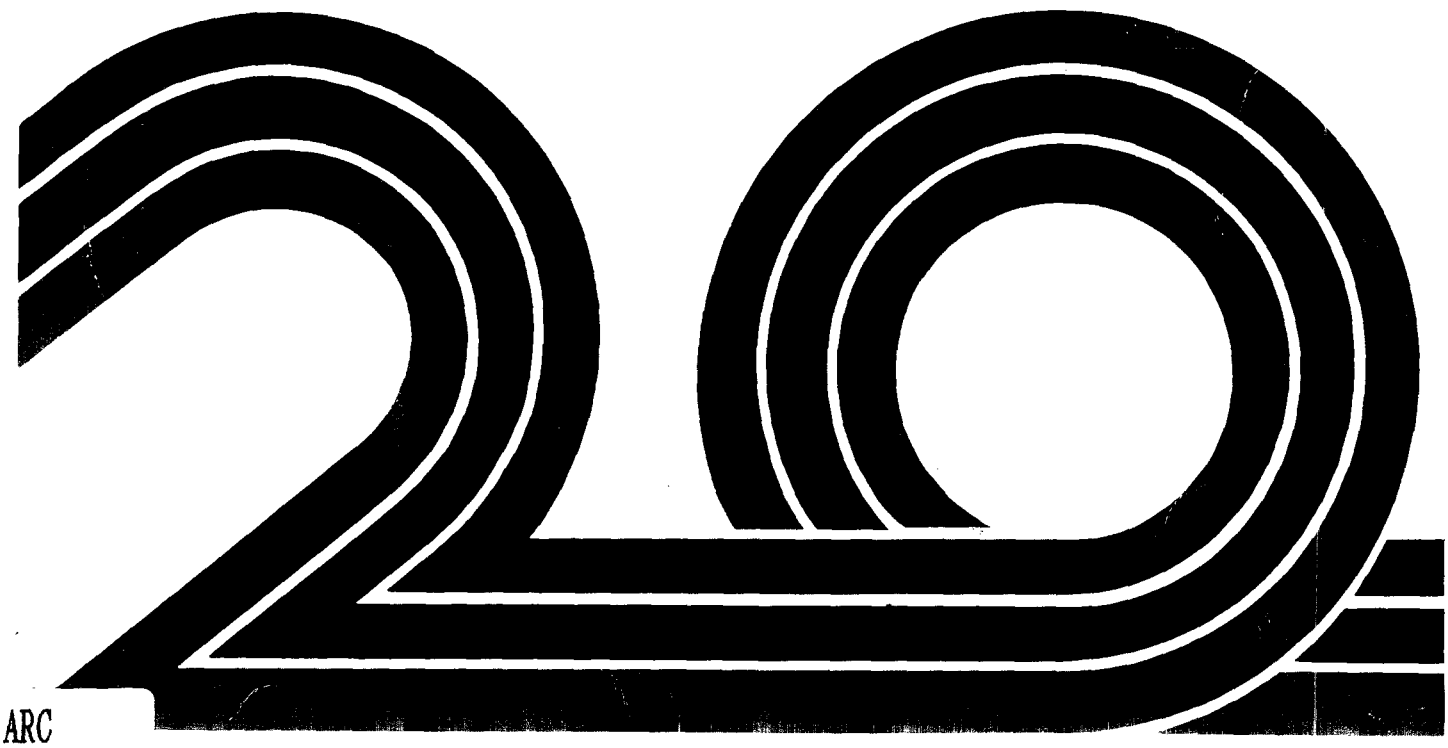
BCIT

CALENDAR 1984-85



1964 ~ 1984

This prospectus gives details of all Diploma and Certificate courses offered by the British Columbia Institute of Technology on a full-time basis. Detailed course descriptions are grouped by individual technologies within the three major Divisions of Business, Engineering, and Health, with an additional section describing Third Year programs.

An Integrated Student Information System (ISIS) is being introduced effective the 1984/85 academic year. This may impose revisions in certain administrative policies and procedures without prior notice. The course numbering system as presented in this calendar will also be changed.

Following the course and technology information is a detailed general information section which gives a variety of information on such matters as admission procedures, fees, counselling, and housing.

A general list of Contents is found at the beginning of the prospectus and a detailed Index is found at the end.

For further information please contact the Office of the Registrar.

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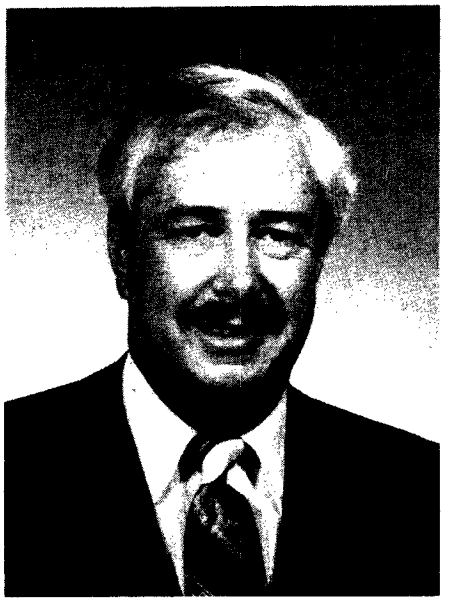
President's Message



Your interest in the British Columbia Institute of Technology as a potential student, a parent, or a leader in industry is welcome.

This publication is designed as a guide to students who may wish to consider one of our many programs of studies, all of which lead to one of the most respected credentials in the work force — the BCIT Diploma of Technology.

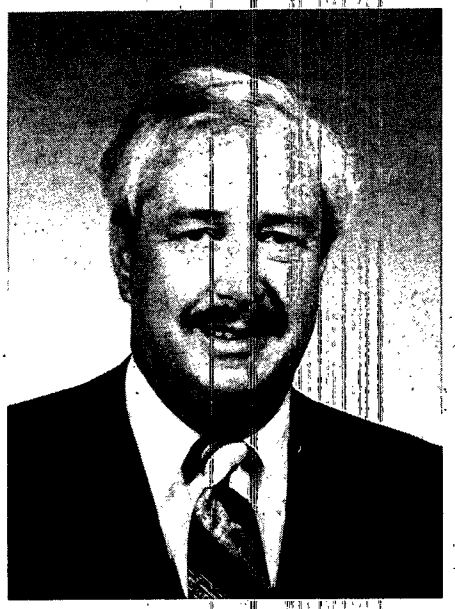
The Calendar lists the faculty members who will provide the technological expertise and training that you require. These faculty members, with their industry and academic background, are the foundation of knowledge at this Institute, and they, along with the graduates, are responsible for the reputation of the BCIT Diploma.

The courses are intensive and the work demanding, but more than 20,000 graduates who have entered BCIT have proven the effort to be rewarding.

This year, 1984, earmarks the Twentieth Anniversary of the British Columbia Institute of Technology. I am pleased to extend a personal invitation to all of our students; past, present and future, to participate in the commemorative activities that are planned as the Anniversary celebrations.

Gordon A. Thom,
B.Comm., M.B.A., M.Ed.,
President

President's Message



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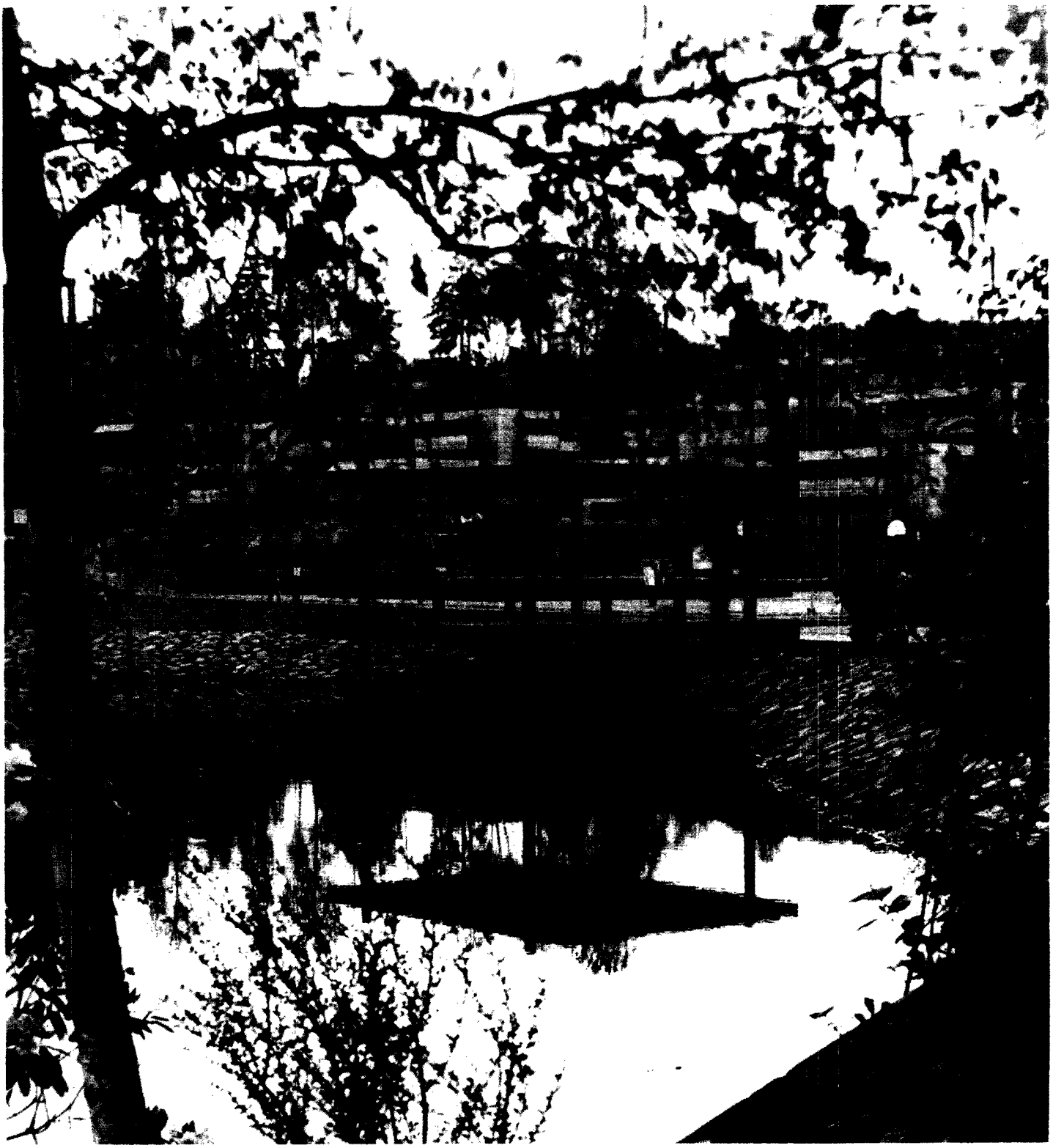
1984 - 85



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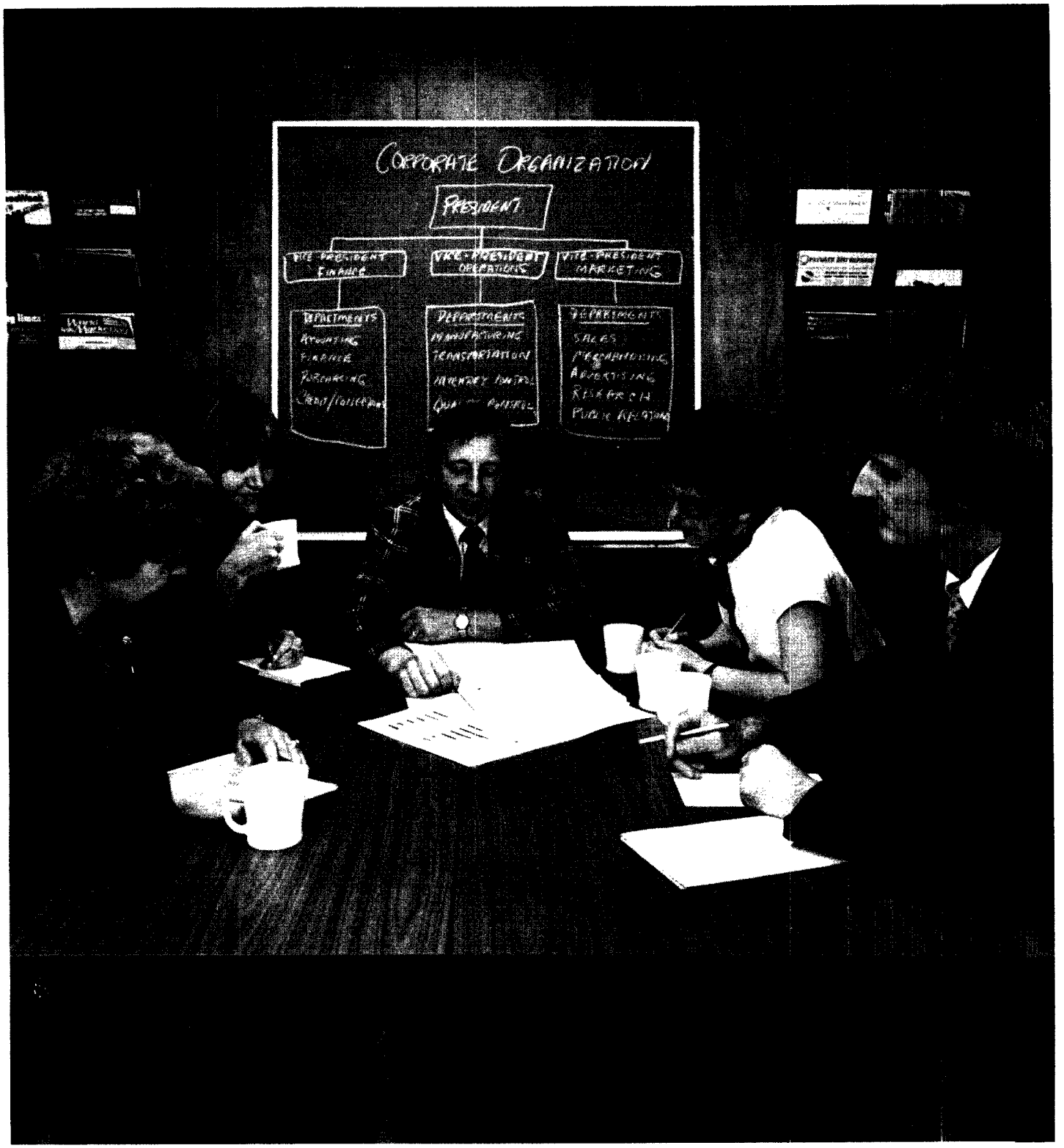
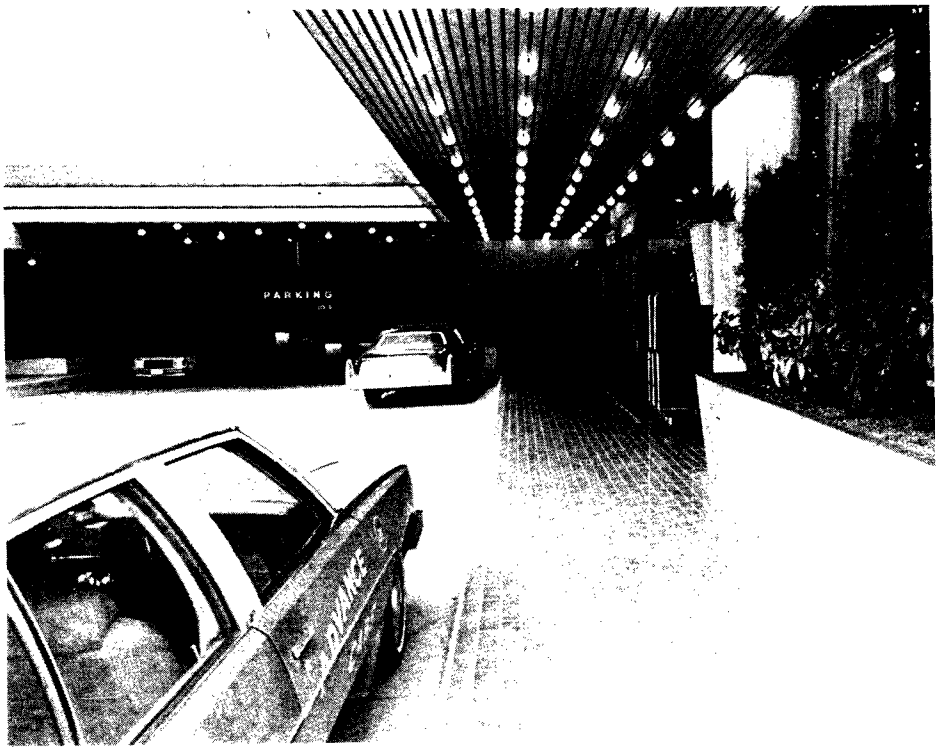
Business Management

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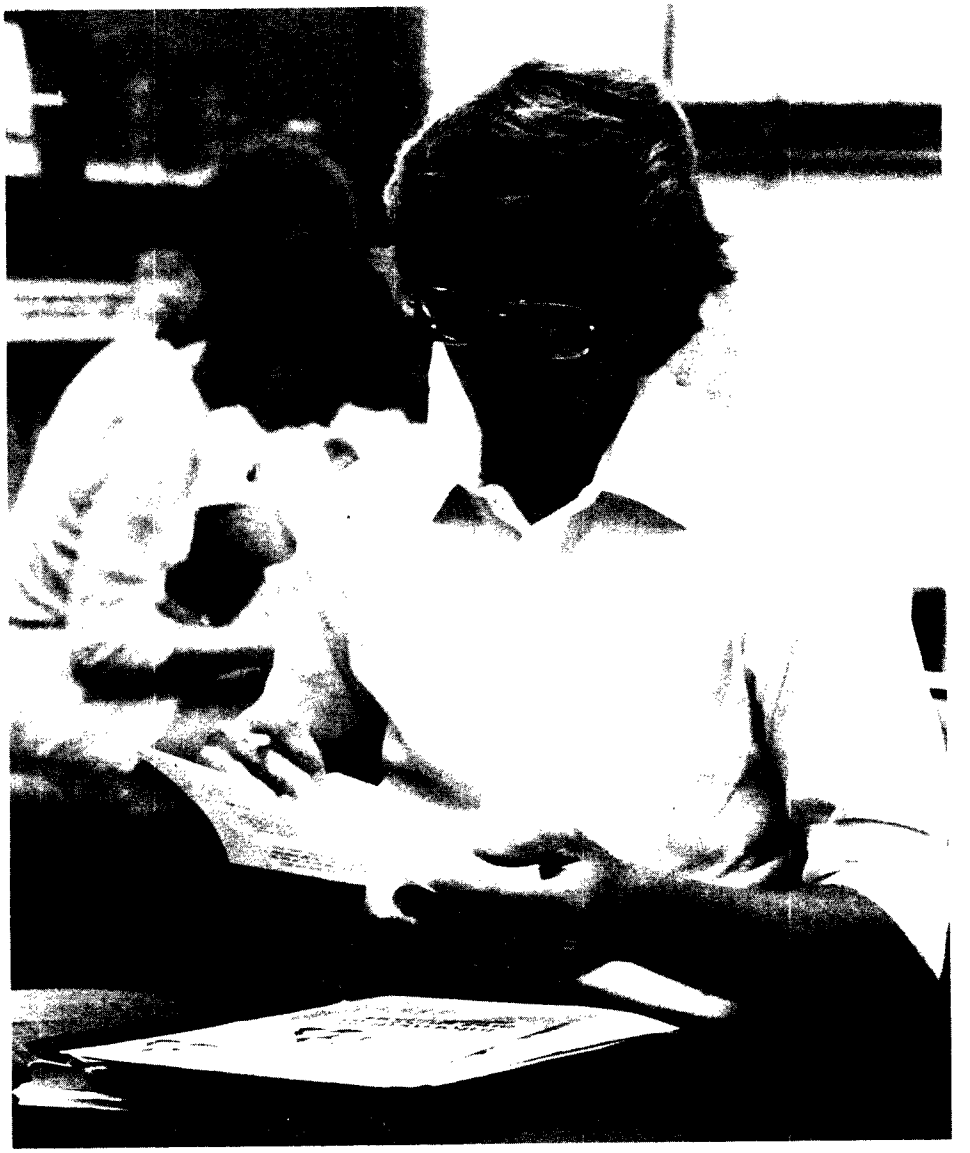


Administrative Management Systems

Many people who are contemplating a career in business management would like to acquire a solid core of knowledge and skills which can then be fitted to any area of the business community. The Administrative Management Technology provides such an opportunity, and is particularly valuable to those who have a special interest in small or self-owned businesses.

Job Opportunities
Graduates of the **Administrative Systems Option** work in planning, banking, finance, production, marketing or real estate. Many now operate their own businesses.
Graduates of the **Personnel and Industrial Relations Administration Option** become involved in manpower selection and placement, manpower training and development, labor-management relations, job evaluation, and organization renewal and development.

The Program
Following a year of general studies, students select one of two options: Administrative Systems, or Personnel and Industrial Relations Administration.

Prerequisites
Graduation from the Selected or Combined Studies Program with Algebra 11 and English 12 with a C+ standing or better. Enrollment is limited. Applicants should apply early stating full details on work experience and outlining extra-curricular activities. Appropriate business experience and/or other successful post-secondary education will greatly strengthen applications.

Applicants should be good communicators and people oriented with a willingness to work effectively with fellow workers and the public.

Admission may be granted to mature students who can provide evidence of probable success in the program.

Specific Prerequisites
Those students wishing to enter the Personnel and Industrial Relations Option from the first year of the technology program should have maturity and relevant work experience as well as competence in communication skills as demonstrated by a minimum of 70% standing in the first year communication courses.

Advanced Standing
Direct entry into the second year of the technology in either Option is possible provided the students have the equivalent of the first year of the program.

Post-graduation
Graduates may earn advance credit towards designation as a Chartered Accountant, a Certified General Accountant, or a Registered Industrial Accountant. Advance credit is also given by the Institute of Chartered Secretaries and Administrators.

Course of Studies

Year 1	Term 1	Clrm hrs/wk
10.100	Management I	3
10.010	Economics	3
10.070	Government and Business	3
14.050	Introduction to Data Processing	4
16.140	Accounting	5
20.191	Marketing	3
22.110	Business Mathematics	4
31.110	Business Communication	4
	Library and Research	6
		35

Year 1	Term 2	
10.001	Management II	4
10.011	Economics	3
10.020	Organizational Behavior	3
14.052	Computers in Business	4
16.240	Accounting	5
20.291	Marketing	3
22.210	Business Statistics	4
31.210	Business Communication	5
	Library and Research	5
		35

Year 2	Term 3	Adm	Pers
10.002	Management III	3	3
10.024	Interpersonal Skills Dev.	—	2
10.030	Industrial Relations	4	4
10.040	Personnel Administration	3	3
10.044	Human Resource Analysis	—	4
10.060	Computer Software Systems	3	3
10.080	Business Law	3	3
16.344	Management Accounting	4	—
16.362	Finance	4	4
20.350	Real Estate Management	3	—
		27	26

Year 2	Term 4	Adm	Pers 4A	Pers 4B
10.003	Management IV	3	4	4
10.031	Collective Bargaining	—	3	3
10.041	Personnel Management Systems	—	4	4
10.042	Employment Records and Benefits Administration	—	—	4
10.043	Interviewing Skills	—	4	—
10.046	Training and Development	—	—	4

Year 2	Term 4 cont.	Adm	Clrm hrs/wk Pers
		4A	4B
10.061	Computer Software Applications	3	— —
10.081	Business Law	3	3 3
10.090	Directed Studies	6	6 6
16.445	Credit and Collections (term A only)	3	— —
16.462	Finance	4	4 4
20.450	Real Estate Management	3	— —
22.410	Management Engineering	4	4 —
22.435	Transportation and Distribution Management (term B only)	3	— —
		29	32 32

Subject Outlines

10.000 Management I — An orientation to the nature of business in the private enterprise system, embracing forms of business ownership, organization, management principles and techniques, as well as the functions of planning and organizing. Students are given an opportunity to develop their analytical skills by analyzing, deliberating upon, and proposing solutions to typical business problems.

10.001 Management II — This course follows on from Management I to give the student a further insight into the functions and practice of management. Areas covered include the main functions of direction and control, as well as topics such as communications, supervision, leadership and a brief introduction to industrial relations.

10.002 Management III — This course emphasizes the use of decision-making models in business. It is designed to train students in the use of quantitative methods in the choice of alternatives in the decision-making process.

10.003 Management IV — An analysis of business policy formulation designed to give the student practice, experience and confidence in handling business situations, including those of a complex nature where basic policy decisions are necessary to assist in problem-solving. Comprehensive business cases will be selected covering several fields such as finance, control, personnel, production, marketing and general management for study and discussion. The course is designed to acquaint the student with the role of top management and the interrelationships between these fields. Determination of an acceptable course of action will be followed by the development of a proposed scheme of implementation.

10.010, 10.011 Economics — The aim of the course is to develop an understanding of the organization and operations of the Canadian economy. Students analyze demand and supply, how production costs vary and how prices are determined in different markets (micro-economics). The theoretical tools of the economist are used to explore the concepts of national income, employment, money and banking, inflation, international trade and growth (macro-economics). An appreciation of the relation between economic theory and economic policy is provided.

10.011 See 10.010

10.020 Organizational Behavior — The study of all factors that either influence or are influenced by people at work. The course will focus on macro factors such as organizational structure, technology and environment; group factors such as conflict and decision making; and micro or individual factors such as attitudes, perception and motivation.

10.024 Interpersonal Skills Development — This lab concentrates on the development of skills for personnel problem solving. It emphasizes role-play training with students in advisory capacities helping management and employees resolve human resource management problems.

10.030 Industrial Relations — A detailed analysis of selected labor-management problem areas with emphasis on the solution of practical existing problems in industrial relations.

10.031 Collective Bargaining — An introductory analysis of the fundamental issues and facts of labor-management relations. Special emphasis is given to collective agreement content and interpretation, bargaining and basic labor economics.

10.040 Personnel Administration — An introduction to the fundamentals of personnel management, including organization of the personnel function; salary administration; fringe benefits; training; management development and performance appraisal; constructive discipline; grievances; and morale.

10.041 Personnel Management Systems — This course develops competancies in several key personnel practitioner areas including job evaluation techniques, wage and salary administration functions, and performance appraisal techniques. Two hours per week micro-computer applications laboratory time are included for preparation of course assignments that make use of micro-computer applications.

10.042 Employment Records and Benefits Administration — The storage and retrieval techniques for employment record and benefits information are presented in this course. Manual and automated records management systems are reviewed.

10.043 Interviewing Skills — A skills development course emphasizing the interpersonal skills necessary for successful selection interviews. Training techniques include role-playing, individual counselling and feedback.

10.044 Human Resource Planning & Analysis — An introduction to the skills and concepts associated with employee data collection and analysis for strategic and human resource planning purposes. Employment planning models, job analysis techniques, and statistical methods of measurement are addressed.

10.046 Training & Development — Develops ability to design and implement a training program with emphasis on practical problems of training in industry.

10.060 Micro Computer Software Systems — Instruction and practice in the use of commercially available Microcomputer Software Systems primarily in the solution of business problems. Typical programs involve word processing, electronic worksheets, data base management, and business graphics.

10.061 Micro Computer Software Applications — A continuation of Computer Software Systems, with emphasis on the solution of practical problems. A level of familiarity with the programs is developed enabling the students to use them in other course areas.

10.070 Government and Business — An examination of the involvement of federal, provincial and municipal government in the regulation and support of business enterprise in Canada. A look at government policy toward monopoly and combines control, the promotion of competition and the stimulation and stabilization of Canadian business. While theories of government intervention will be examined, the course will concentrate on the practical aspects of government involvement with business. Examples of specific government programs will be explored to determine their effects on the business enterprise.

10.080, 10.081 Business Law — A study of legal rules and principles which guide decisions involving the law of contracts, including the sale of goods and negotiable instruments, as well as the business associations of agency, partnership and the company.

10.081 See 10.080

10.090 Directed Studies — This course is designed to give the student some practical application of concepts learned in major program areas by engaging in problem-solving projects in business or government.

14.050 Introduction to Data Processing — Training in basic data processing principles to develop recognition of the possible application of these principles in industry. The principal functions of data processing will be illustrated and practiced with an H.P. minicomputer operating interactively. Elementary computer programs will be written and tested on the computer. Use of flow charting and elementary data processing systems design will illustrate the achievement of data processing objectives.

14.052 Computers in Business — For those people who are not specializing in data processing, a look is given at the types of computer systems currently in use in business. Topics include computer hardware and software development, program preparation (students will code and execute a COBOL program in this section), input-output media and devices, data centres, operating systems, controls in computer systems, installing a computer and current trends in the computer industry.

16.140, 16.240 Accounting — Basic accounting procedures; closing the books; adjustments; working papers; merchandise operations; statement and ledger organization; special journals; forms of business organization; accounting principles; introduction to cost accounting; analysis of financial data; working capital; departmental and branch operations; consolidations.

16.240 See 16.140

16.344 Management Accounting — The management accountant's role; income determination; decision-making; profit planning; budget; forecasting; profit-margin variance analysis; corporate financial analysis; income tax; internal control; annual report; accounting aids for sales and production management; measuring managerial performance; direct costing and the contribution approach.

16.362, 16.462 Finance — An investigation of different methods of raising funds for new and existing businesses, corporate and noncorporate. Business risk and uncertainty. Analysis of important financial decisions. Working capital policy, capital budgeting, dividend policy, capital structure. Failure and bankruptcy.

16.445 Credit and Collections — Study of various types of credit and their use by retail businesses, financial institutions, commercial enterprises and consumers. Includes sources of information, credit policy and control and collection techniques.

16.462 See 16.362

20.191, 20.291 Marketing — This course is designed to give students a good understanding of the role of marketing in a firm. Marketing plays a critical role in any firm dealing in a product or service and the decisions made by the marketing manager are reflected in the administrative and financial functions of a firm. The lab sessions will deal with typical marketing problems and students are exposed to the decision-making process in marketing management.

20.291. See 20.191

20.350, 20.450 Real Estate Management — The real estate function includes law, estates and interests in land and the personal and business management decision process. The economic characteristics of urban real estate and the market, city growth and development, locational factors in influencing the determination of land use and ownership, institutional lenders, the mortgage market and the functions of the real estate agent, salesman and appraiser are covered.

20.450 See 20.350

22.110 Business Mathematics — Review of basic mathematics applicable to business and industry; mathematics of finance, including retail operations, simple and compound interest, discounts, annuities, financial papers and depreciation methods. Emphasis is on practical applications as applied to business administration.

22.210 Business Statistics — Major emphasis on descriptive statistics, including numerical and graphical presentation of data, measures of central tendency and dispersion, elementary probability, index numbers and time series. Introduction to inferential statistics through selected topics such as sampling, confidence limits of the mean, hypothesis testing and simple linear regression.

22.410 Management Engineering I — Scientific approach to problem-solving, with particular application to administrative management problems. Includes method study, systems and procedures, charting and analysis, forms design and control, work distribution, layout, planning and scheduling, measurement and costing.

22.435 Transportation and Distribution Management — The total distribution concept has undergone many rapid changes over the past few years. The Canadian transportation scene will be investigated in detail because of its importance to our economy. Included in these studies will be an analysis of the various modes of transportation, our trade patterns with foreign lands, techniques of moving goods between shippers and receivers, materials handling and storage and related activities.

31.110, 31.210 Business Communication — Students will be instructed in the skills and techniques required to write memos, letters and reports of the kind used in business; to speak in small and large group situations; and to develop effective telephone techniques. The course begins with a brief review of the communication process and includes an organizational approach to writing and speaking tasks. The course includes modules on the job search and study skills. One lecture per week provides core information. Practical application of the material occurs in the three labs held weekly and through periodic assignments.

31.210. See 31.110

Faculty and Staff

R.A. Cradock, B. Comm., M.B.A., R.I.A., F.S.M.A.C. Department Head
G.E. Bissell, B.Comm., M.A.
C.H. Chiko, Ph.D.
C. Clark, B.A., M.A.
D. Davis, B.A., M.A., LL.B.
J.P. Dean, B.A., M.A.
C.J. Dickhoff, B.A., M.A., (Econ.), M.A. (Public Admin.), Program Head
P. Durkee, B.B.A., M.A.
L.A. Fingarson, B.Comm., Program Head
H.G.J. Herron, B.A. (Cert. Public Admin.)
R.W. Hooker, B.A., B.Sc., M.A., LL.B.
C.L.R. Jaques, B.A., M.A., Chief Instructor
L.E. Johnson, B.A., M.B.A.
L. Jones, B.Sc., M.Sc.
T.P. Juzkow, B.A.Sc., M.B.A., P. Eng. Program Head
A.G. Liddle, M.B.A.
D. Pepper, B.A., M.Sc., Ph.D.
D. Schram, B.Comm., M.Sc. (Intn. Bus.)
R.M. Sharp, B.A.Sc., M.B.A., P.Eng. Senior Instructor
G. Storey, B.A., M.Sc. Program Head
N.E. Stromgren, C.D., B.A., M.Ed. (Admin.)
B. van der Woerd, B.A.
J.H. Viger, B.Comm.
F.C. Williams, B.A. (Hons), M.A.
R.A. Yates, LL.B., M.B.A., Senior Instructor

Broadcast Communications

The Broadcast Communications program was initiated through the combined efforts of the private sector of the industry and the Canadian Broadcasting Corporation in this province. The need for trained personnel continues to grow in broadcast journalism, radio and television production. Those interested in entering fields other than mass communications through broadcasting, i.e. audiovisual production, public relations or cablecasting, will find much of the basic technical background included.

The educational emphasis is upon versatility so that a graduate may find employment in a variety of occupations within the broadcast industry. Students will enrol in one of the three options: Radio Production, Television Production or Broadcast Journalism. The first of the four terms in the course is designed to provide a general background, with the remainder of the time dedicated to concentrated effort in all aspects of the chosen option.

Job Opportunities
Graduates are employed throughout British Columbia and in all parts of the world, wherever radio, television or cable facilities exist.

The Program
Television Production — Concentration is on the production tools of a modern television broadcast station or cable facility. Full use of color, and experience in producing all types of modern television productions is provided so that the student may work his or her way through most of the operational positions in the television hierarchy.

Radio — A detailed background is provided in AM and FM radio. Detailed instruction is given in announcing, on-air work, commercial copywriting and production, as well as other areas of radio operations. Students also receive as much practical experience as can be given in the time available.

Broadcast Journalism — This option prepares students for careers as news reporters, newscasters and editors in radio and television. Training includes the basic news broadcasting skills and academic courses. Skills, such as news writing, audio and video editing and announcing are combined with substantial knowledge of politics, economics, and other topics. Actual newsroom and field reporting operations give the student experience in skill development and judgment.

General Information
Students must pass an audition and aptitude tests, where applicable, and must be able to type 25 correct words per minute to qualify for entrance into the technology.

In each of the options students are graded against industry and professional standards and must achieve such standards within their period of study.

Prerequisites
Graduation from the Selected or Combined Studies Program is a general prerequisite. Only a limited number of students can be accepted each year and applicants should apply early. Information meetings are held Mondays at 5:30 p.m. in room 129, just off the north foyer in building 1A. If on-campus interviews are not possible, please write to the Department Head and an interview in the field may be arranged. In making application, full details on related experience and extracurricular courses or aptitudes should be included. Prior to final acceptance, all applicants are given formal interviews and are dealt with individually. No waiting list is established.

The prospective student is expected to have a thorough knowledge of English. Previous studies in the areas of political science, history and other humanities, as well as current events will also prove of value. **Note:** All applicants must submit a short essay (approximately 500 words) detailing their reasons for choosing broadcasting as a career. This essay should accompany the application, as should all pertinent documents, letters of reference and recommendation, transcripts, etc.

Course of Studies

Year 1	Term 1	Radio	TV	Clrm hrs/wk Bdcst. Jrn.
10.012	Economic Issues	—	—	3
10.023	Interpersonal Relationships	3	3	—
12.101	Radio Operations	6	—	—
12.102	Introduction to Television	—	11	—
12.103	Radio News	2	—	—
12.105	Industry Organization	2	2	—
12.106	Awareness	2	—	—
12.107	Technical Introduction	2	2	—
12.108	Directed Study and Projects	7	8	7
12.111	Announcing	4	—	—
12.113	Introduction to Broadcast News Reporting	—	—	2
12.114	Announcing Introduction	—	—	3
12.115	Broadcast News Writing	—	—	4
12.116	Radio Basics	—	—	4
12.117	Television Basics	—	—	4
12.118	Picture Basics	—	2	2
12.131	Municipal Government for Reporters	—	—	2
12.190	Copywriting	3	3	—
31.112	Communications for Broadcasters	4	4	4
		35	35	35

Year 1	Term 2	Radio	TV	Bdcst. Jrn.
12.201	Radio Operations	8	—	—
12.202	Introduction to Television	—	14	—
12.204	Photography and Darkroom Techniques	—	1	—
12.205	Television News	2	2	—
12.206	Awareness	2	—	—
12.208	Directed Study and Projects	8	8	7
12.209	Theory of Color Television	—	1	—
12.211	Announcing	4	—	—
12.213	Introduction to Broadcast News Reporting	—	—	3
12.214	Announcing Introduction	—	—	3
12.216	Radio Newsroom Lab	—	—	6
12.217	Television News Lab	—	—	4
12.232	Government and Politics	—	—	4
12.233	Current News Issues	—	—	2
12.234	**B.C. Broadcast Tour (one week in March)**	**8 hrs/day for 5 days**		
12.290	Copywriting	3	3	—
14.220	Computer Systems for Broadcasting	2	—	2
22.212	Statistical Applications to Media	2	2	—
31.212	Communications for Broadcasters	4	4	4
		35	35	35
12.219	**Practicum (mid April to term end)**	35	35	35

Year 2	Term 3	Radio	TV	Bdcst. Jrn.
12.301	**Radio (2 week cycle)**	*20	—	—
12.302	Television Production	—	14	—
12.305	Television News	—	4	—
12.308	Directed Study and Projects	14	8	6
12.309	Color Television Theory	—	1	—
12.310	Television Production Planning	—	1	—
12.311	**Radio Operations (2 week cycle)**	*28	—	—
12.313	Investigative Reporting	—	—	2
12.315	Newsroom Operations	—	—	3
12.316	Radio News	—	—	10
12.317	Television News	—	—	10
14.320	Computer Systems for Television	—	3	—
31.312	Communications for Broadcasters	*8	4	4
		35	35	35

***This total of 56 hours over 2 weeks averages 28 hours per week.**

Year 2	Term 4	Radio	TV	Bdcst. Jrn.
12.401	**Radio (2 week cycle)**	*20	—	—
12.402	Television Production	—	17	—
12.403	Television Theory	—	2	—
12.405	Television News	—	4	—
12.408	Directed Study and Projects	*14	7	5
12.411	**Radio Operations (2 week cycle)**	*28	—	—
12.414	Advanced Announcing	—	—	2
12.415	Newsroom Operations	—	—	4
12.416	Radio News	—	—	10
12.417	Television News	—	—	10
31.412	Communications for Broadcasters	*8	4	4
		35	35	35
12.419	**Industry Practicum for all Second Year Broadcast Students. Last 4 weeks of term.**			

***This total of 56 hours over 2 weeks averages 28 hours per week.**

Subject Outlines

10.012 Economic Issues — In one lecture and two seminar hours per week, students are acquainted with fundamental analytic tools in economics and with economic issues in Canada.

10.023 Interpersonal Relationships — Broadcasting involves an unusually close interaction among its participants, who work together to provide information, entertainment and station revenues. The course explores the importance of harmonious relationships and how to achieve them.

12.101, 12.201 Radio Operations — An introduction to the equipment and techniques used in radio broadcasting. Starting with station organization, the student continues with a study of microphones, radio control boards, tape machines and all broadcast accessories, and develops the manual dexterities needed in the operation of this equipment.

12.102, 12.202 Introduction to Television — An introduction to the processes of television picture transmission and the equipment used in broadcast television. Camera, lighting equipment, telecine equipment, video switchers, video-tape recording and color. Manual dexterity is developed in the operation of this equipment in a studio and control-room situation. The first term will also include the development of planning and scheduling skills, time management and entrepreneurial skills.

12.103 Radio News — This course is specifically tailored to the radio option and introduces students to the process of gathering and presenting news for radio. The course covers news sources and the role of news in radio programming. Attention is also given to legal questions, including libel and contempt of court.

12.105 Industry Organization — A study is made of the history of broadcasting from its first steps through to present-day. The rules and regulations under which broadcasting in Canada is governed is also covered. The student is introduced to the development of programming, copyright, broadcast systems and management.

12.106, 12.206 Awareness — It is essential that people in broadcasting have as broad a base of external knowledge as possible. This course combines lectures and practical exercises and deals with present-day happenings on the local, regional, national and international level.

12.107 Technical Introduction — Students are introduced to the basics of electricity, magnetism, batteries and other principles which are then applied to the equipment they will be working with. The origin of sound is traced through the entire processing and transmission system to its ultimate reception in the listener's home. The same is done with the sending and receiving of television pictures. This is an elementary introduction to explain "how things work".

12.108, 12.208, 12,308, 12.408 Directed Study and Projects — To be assigned at the commencement of the term.

12.111, 12.211 Announcing — An introduction to effective speaking for radio. The course combines classroom instruction with work sessions that employ class critiques. Regular auditions measure individual progress.

12.113, 12.213 Introduction to Broadcast News Reporting — This course deals with the substance of news stories and how to approach the task of reporting for radio and television. Among the topics covered

are police matters, the courts, community emergencies, labor negotiations, libel and taste.

12.114, 12.214 Announcing Introduction — The student is introduced to basic concepts of voice production, announcing skills and news reading. Stress is placed on daily practice, and students receive coaching in groups and individually.

12.115 Broadcast News Writing — This is a practical course, designed to develop the student's ability to write concise, lively news copy, suitable for reading on air. The course includes consideration of copy formats and editing skills, but its stress is on practice and coaching.

12.116 Radio Basics — Journalism students are introduced to radio station organization, programming concepts, radio broadcast equipment and production techniques. The course is designed to give the student a basic appreciation and understanding of all aspects of radio broadcasting.

12.117 Television Basics — Application of television equipment and production techniques to news and public affairs constitutes the major thrust of this course. Appreciation of basic technical and production principles comes through lectures and "hands on" experience. The course provides the grounding that students require for later television newscasting work.

12.118 Picture Basics (Jrn. Option) — This course covers the fundamentals of picture taking, including practical aspects like focus, lighting etc., and creative aspects like how to tell stories with pictures. The course provides the conceptual base for later work in electronic news gathering (E.N.G.) techniques.

12.131 Municipal Governments for Reporters — This course follows a lecture format, with practical assignments, and covers the fundamental operations, structures and problems of local government in B.C. The focus is related directly to news reporting work.

12.190, 12.290 Copywriting — The course familiarizes students with advertising techniques, particularly in the broadcast media. Lectures and workshop sessions relate to the writing and evaluation of radio and television commercials. Basic marketing concepts, the function of advertising in society and the economics of broadcast are related. Commercials are studied in detail. Special emphasis is placed on developing the student's ability to work within a group situation. While students may not become writers, the course could lead to a position in broadcast sales, sales promotion or advertising generally.

12.201 See 12.101

12.202 See 12.102

12.204 Photography and Darkroom Techniques — This course, which is designed for TV students, concentrates on 35 mm photography in TV stations where the production of slides for news and commercial use is often extensive. Students learn how to take good pictures and to develop and print them.

12.205, 12.305, 12.405 Television News — Designed for students taking the Television Option, this course familiarizes students with the basics of newsroom operations, key position and on-air presentation. There is a close liaison between the Journalism Option and the Television Option in the daily presentation of a television newscast.

12.206 See 12.106

12.208 See 12.108

12.209 Theory of Color Television — This course begins with the psychophysics of human color vision and explains how the eye sees and adapts to colored objects. This theory is then applied to the N.T.S.C. color television system used on this continent. The course then explores how the television system processes the color signal, how to properly set up and match color cameras and how to properly adjust a color picture monitor.

12.211 See 12.111

12.213 See 12.113

12.214 See 12.114

12.216 Radio Newsroom Lab — In a lab situation, students practice news writing, makeup and delivery of newscasts and filing systems operation. Attention is also given to story treatment and developing news judgment.

12.217 Television News Lab — This course trains students to gather, research and edit a news story for television. Practical work on story content and Electronic News Gathering (E.N.G.) techniques are assigned both within and outside of classroom hours. Some attention is also given to television newscast makeup and presentation.

12.219 Practicum — In this four-week practical exercise, students operate a full-time radio station and radio and television newsroom applying and developing those skills that have been acquired over the previous two terms.

12.220 Computer Systems for Broadcasting — The computer as an important servant of broadcast communication—traffic, programming and sales. Field trips to Vancouver stations supplement classroom instruction.

12.232 Government and Politics — This course in fundamental politics is directed toward news-related "literacy". Topics include fundamental concepts in political analysis, patterns of international politics, and government structure in B.C., Canada, the United States, Communist countries and single-party and democratic republics.

12.233 Current News Issues — Research, reading and class discussion on topical subjects are designed to deepen the student's understanding of news-related issues and methods of approaching them.

12.234 B.C. Broadcast Tour — During the spring term, students will be taken on a one-week tour of interior British Columbia radio stations and radio and television news operations. Students may also be assigned to visit some Lower Mainland stations and to compile a comparative report.

12.290 See 12.190

12.301, 12.401 Radio (2 week cycle) — Putting the fundamentals of radio production to work. The elective deals with all aspects of modern radio broadcasting in which the student is given ample opportunity to expand techniques learned in the first year into modern and creative broadcasting.

12.302, 12.402 Television Production — Students engage in the production of television broadcasts, making full use of studio facilities in the production of television programs, commercials, special events coverage and carrying out on-the-job training projects.

12.308 See 12.108

12.310 Television Production Planning — This course explores the professional techniques involved with scene design, planning and construction and the use of lighting to enhance the mood of the set design. The pre-planning of any television production, and how it affects the work to be done in various departments is also covered in detail.

12.311, 12.411 Radio Operations (2 week cycle) — Daily operational lab experience using the campus radio station as a basis for learning, experimentation and professional development.

12.313 Investigative Reporting — Uncovering concealed information and methods and sources of general news investigation form the basis of this advanced course in reporting. Topics such as confidentiality of sources, confirming information, and bias are also considered.

12.315, 12.415 Newroom Operations — Strategy of news coverage, file systems, newsroom operational techniques and development of news judgment through lectures and detailed critiques of assignments, provides the theoretical base to go with concurrent lab courses.

12.316, 21.416, Radio News — Rotating between outside reporting and inside news desking positions, students undertake daily news operations and contribute their part to the half-hourly radio news schedule through the broadcast day.

12.317, 12.417 Television News — Rotating through the list of television newsroom functions during the course of the terms, students undertake tasks directed toward the production of a daily local television newscast.

12.401 See 12.301

12.402 See 12.302

12.403 Television Theory — This course explores a variety of topics that are not necessarily equipment oriented, such as types of programs, management, budgeting and automation. These topics are essential reference subjects for a variety of situations a television employee could be engaged in, or should have as reference knowledge.

12.408 See 12.108

12.411 See 12.311

12.414 Announcing - Advanced — Further practice and polishing of regular news announcing skills are mixed with specialized announce subjects, ad-lib skills, interview techniques, etc. Toward the spring, emphasis shifts to final polishing in readiness for employment.

12.415 See 12.315

12.416 See 12.316

12.417 See 12.317

12.419 Industry Practicum — During the last month of final term, students are located in industry positions where they are given the opportunity to observe and often do "hands-on" work.

14.220, 14.320 Computer Systems for Television — The computer as an important servant of television in traffic, programming and sales. Field trips supplement classroom instruction.

14.320 See 14.220

22.212 Statistical Applications to Media — This course initially examines the elements of descriptive statistics; these comprise techniques for collecting, summarizing and treating data so as to facilitate its use and comprehension. Graphic presentation is emphasized. Forecasting techniques are discussed, as is the construction of basic index numbers, with emphasis on the Canadian Consumer Price Index and its ramifications. The B.B.M. and the Nielsen ratings, opinion polling and station rate cards are also covered in detail.

31.112, 31.212 Communications for Broadcasters — Through lectures, discussions and workshops, this course covers all forms of communication, especially writing. Students completing the course should be able to deal effectively with business writing (letters, memos, reports), practical writing (resumes, proposals) and broadcast writing (editorials, reviews, short features).

31.212 See 31.112

31.312, 31.412 Communications for Broadcasters — Emphasis in this course is placed upon writing for the media. Sale messages, dramatic scripts, documentaries, news copy and original program proposals are written by the student, who also participates in voice exercises and play readings. To stimulate critical awareness, students are expected to watch and write reviews on several live performances and motion pictures. Guest lecturers from the arts and the media will be utilized, where possible.

Note: As far as possible, materials and assignments used in this course will be geared to the individuals elective; i.e., Radio, Television or Broadcast Journalism.

31.412 See 31.112

Faculty and Staff

F.L. Sanderson, Dipl. Ed., B.Th.,
Department Head
J.W. Ansell, Dipl.T.
B. Antonson, Dipl.T.,
Program Head (Radio)
H. Dorfman, B.A.
T.J. Garner, B.A.
T. Handel, Dipl.T., Dipl. Adult Ed.
M. Hesketh, Program Head (Broadcast Journalism)
K.W. Hughes, Dipl.Ed.
J.J. Kemp
R. Liepert
D. Miller, B.A.
K.J. Mitchell
P. Munoz
R.H.B. Nason, B.A., M.A.
B. O'Neill, Senior Maintenance Engineer
R. Riskin, Dipl.T.,
Program Head (Television)
D.W. Short
W.A. Smith
S. Smolar, B.A.(Comms.), C.E.T.
T. Stacey, B.A. (on leave)

Computer Systems

The computer has made it possible to store, retrieve and analyze vast quantities of complex information at high speed and has become invaluable as a managerial tool. Computers are now commonplace in business accounting, banking and airline reservations systems and are also used in scientific research applications, in compiling insurance actuarial tables and in planning and control of industries. But in order for the computer to do its job, an analyst must define the problem and a programmer must give the computer a detailed set of instructions in a logical progression to handle every conceivable situation in solving the problem. Thus it is the human element which determines the degree of success of any computer application.

Job Opportunities
Most graduates begin their careers as junior programmers and, after some experience, may choose to move into jobs as systems analysts, programmer analysts or operating systems programmers. Others may become technical writers or move into sales or supervisory positions.

The Program
The first year of the program is comprised of basic business courses such as accounting, economics, statistics and an introduction to programming and systems. In the second year, students specialize in either **Information Systems** or **Management Systems** (the applications of computer models to assist management in planning and control). The Management Systems Option is limited to one set of students. Where the number of applicants exceeds the acceptable set size, students will be selected using a weighted average of first year marks in Economics (10.010 Computer Systems I and II (14.170 and 14.270) and Statistics in Business and Industry (22.214).

Prerequisites
Graduation from Grade 12 with at least a B+ average. Specific subjects and grade requirements are Algebra 12 with an A; English 12 and Physics 11 or 12 each a B; and, at least 4 other Grade 12 academic courses from areas such as science, language, and history.

In the case of mature students, academic transcripts may be supplemented by relevant business experience, successful recent completion of relevant BCIT Continuing Education courses with 75% or successful recent completion of relevant courses at other Post Secondary Institutions with 75%.

Candidates may be asked to write an aptitude test to aid in selection process. All applicants should enjoy solving problems with a logical and systematic approach.

Course of Studies

Year 1	Term 1	Clrm hrs/wk
10.080	Business Law	3
14.160	Computer Programming I	5
14.170	Computer Systems I	5
16.140	Accounting	5
20.090	Marketing	3
22.114	Applied Mathematics	5
31.114	Business Communication	4
	Library and Research	5
		35

Year 1	Term 2	
10.010	Economics	3
14.260	Computer Programming II	6
14.270	Computer Systems II	5
14.295	Microcomputer Systems and Applications	3
16.240	Accounting	5
22.214	Statistics in Business and Industry	4
31.214	Business Communication	4
	Library and Research	5
		35

Year 2	Term 3	Infor Syst	Mgt Syst
10.020	Organizational Behavior	3	—
14.306	Management Decision Systems I	—	8
14.307	Introduction to Decision Systems	3	—
14.360	Computer Programming III	8	8
14.370	Computer Systems III	8	8
14.380	Software Support Systems	2	2
16.341	Cost and Managerial Accounting	4	—
16.343	Cost Accounting	—	4
22.334	Management Engineering I	3	—
	Library and Research	4	5
		35	35

Year 2	Term 4		
10.005	Management Fundamentals	3	3
14.409	Management Decision Systems II	—	8
14.460	Computer Programming IV	8	8
14.470	Computer Systems IV	8	8
14.480	Software Support Systems	2	2
16.441	Cost and Managerial Accounting	4	—
22.434	Management Engineering II	4	—
	Library and Research	6	6
		35	35

Subject Outlines

10.005 Management Fundamentals — An insight into the basic nature of business problems and the administrative process involved in handling them, with emphasis on the personnel management function. Study and discussion is undertaken of actual business situations illustrating problems frequently met in industry requiring managerial analysis, decision and action. A sequel course to Management I.

10.010 Economics — The aim of the course is to develop an understanding of the organization and operations of the Canadian economy. Students analyze demand and supply, how production costs vary and how prices are determined in different markets (micro-economics). The theoretical tools of the economist are used to explore the concepts of national income, employment, money and banking, inflation, international trade and growth (macro-economics). An appreciation of the relation between economic theory and economic policy is provided.

10.020 Organizational Behavior — The study of all factors that either influence or are influenced by people at work. The course will focus on macro factors such as organizational structure, technology and environment; group factors such as conflict and decision making; and micro or individual factors such as attitudes, perception and motivation.

10.080 Business Law — A study of legal rules and principles which guide decisions involving the law of contracts, including the sale of goods and negotiable instruments, as well as the business associations of agency, partnership and the company.

14.160 Computer Programming I — An introduction to the principles of programming using IBM Assembler language. Emphasis is on the understanding of the mode of operation of a program, practice in the flow-charting, coding, debugging and documenting of simple business applications.

14.170 Computer Systems I — An introduction to the common accounting and financial applications found in a typical business office. Attention is paid to the system life cycle, feasibility studies, system design, system development, and the role of the systems analyst in the system phases. The course includes practice with some common tools used in analysis and design, and a group project to convert a clerical system to a computer system.

14.260 Computer Programming II — This course is a continuation of the Assembler language introduced in 14.160. Topics include base/displacement addressing, table searching and data validation. Introduction to COBOL language using structured programming. Topics include divisions, arithmetic, logic, PERFORM statement, updating disk files, table searching.

14.270 Computer Systems II — Introduction to computer systems design and standard systems analysis techniques. Emphasis is on financial applications such as payroll, accounts payable, accounts receivable, inventory and general ledger. Human factors and ethical issues are stressed.

14.295 Microcomputer Systems and Applications — A study of microprocessors and microcomputer systems. Stresses the wide range of microcomputer applications as well as the differences and similarities to mini/mainframe systems. Topics include: overview of LSI and VLSI technology, microcomputer system architecture, hardware and software characteristics, applications and application considerations. Also includes selected topics in computing fundamentals such as: Turing Machine concepts, Boolean logic, and Digital design principles. Students complete a project involving microcomputer hardware, software or related topic.

14.306 Management Decision Systems I — The development of computer and non-computer models which assist management in decision making in an uncertain environment. Topics include decision theory, inventory models, queuing theory, simulations of discrete and continuous systems, and risk analysis. Behavioral as well as quantitative aspects are emphasized. Feasibility studies, reports, and presentations are required throughout. Students develop programs in FORTRAN and PASCAL.

14.307 Introduction to Decision Systems — An overview of the use of computers to assist management in short and long run decision making for planning and control. Topics include decision theory, inventory models, simulation, and linear programming, as well as the behavioral aspects of implementation of computer models.

14.360 Computer Programming III — Continuation of 14.260. Completion of Assembler language programming including the linkage of separately written program sections. Completion of COBOL language. Students write several programs incorporating a variety of programming techniques.

14.370 Computer Systems III — Continuation of systems analysis introduced in 14.270. Topics include disk storage characteristics, on-line systems and an in-depth study of file organization methods, Sequential, Indexed and Direct.

14.380, 14.480 Software Support Systems — This course covers technical topics in hardware and software related to operating systems and other software support systems. Topics include hardware and software architecture, operating systems, resource management (memory, processor, 1/0 device, data, etc.). Utility functions, and programming language issues.

14.409 Management Decision Systems II — Systems which assist management in planning and control of projects, the allocation of scarce resources and other short and long range planning and operational decisions. As in Management Decision Systems I, behavioral as well as quantitative aspects of the systems are examined and feasibility studies, reports and presentations are required. Topics include PERT and CPM scheduling methods; linear programming theory and application with emphasis on problem formulation, sensitivity analysis and implementation of findings; non-linear, integer and dynamic programming; comparison of optimization, simulation and heuristic methods; choosing the appropriate technique. The course uses "package" programs where applicable.

14.460 Computer Programming IV — Continuation of 14.360, including PL/1 language, the chief programmer team approach, and on-line programming in CICS. For a four week period students work on one of the following electives: Additional PL/1, RPG, Additional Operating systems, PASCAL. Considerable time is spent on a large multi-program system. This system is programmed from the design work performed in Computer Systems IV (14.470).

14.470 Computer Systems IV — Covers methods used in the development of business data processing systems; structured systems analysis; data base concepts; design of on-line systems. Also includes a series of special topics of current interest.

14.480 See 14.380

16.140, 16.240 Accounting — Basic accounting procedures; closing the books; adjustments; working papers; merchandise operations; statement and ledger organization; accounting principles; introduction to cost accounting; analysis of financial data; working capital; departmental and branch operations; consolidations.

16.240 See 16.140

16.341, 16.441 Cost and Managerial Accounting — The accountant's role in the organization; major purposes of cost accounting; cost-volume-profit analysis; job-order accounting; budgeting; responsibility accounting; standard costs; direct costing; relevant costs; capital budgeting; cost allocation; joint and byproducts; process costing; payroll; factory ledgers; transfer pricing.

16.343 Cost Accounting — Direct costing and the contribution approach; cost-volume-profit analysis; cost analysis for managerial planning and decisions; inventory planning, control and valuation; budgeting and profit planning; standard costs; cost and price variance analysis; capital budgeting. Applications on HP3000 will be studied during late term labs.

16.441 See 16.341

20.090 Marketing — A marketing course designed to describe the role of marketing in the business environment with special emphasis on applications to the computer industry. Areas covered include market research, target markets, product planning, promotion, distribution and pricing methods. The application of the above marketing considerations are related to consumer and industrial goods and services.

22.114 Applied Mathematics — Review of relevant algebra and graphs for business applications followed by a comprehensive coverage of mathematics of finance. Topics include simple and compound interest, annuities, discounting, project evaluation methods, and retirement/replacement of assets.

22.214 Statistics in Business and Industry — Fundamentals of descriptive statistics and an introduction to inferential statistics. Covered in the latter are probability theory, sampling and sampling distributions, estimation, hypothesis testing, and linear regression and correlation analysis using SPSS.

22.334 Management Engineering I — The scientific approach to problem-solving, with particular application to business enterprises. Topics include method study, activity sampling, layout, forms design and control, the critical path method of scheduling, planning, work measurement and costing.

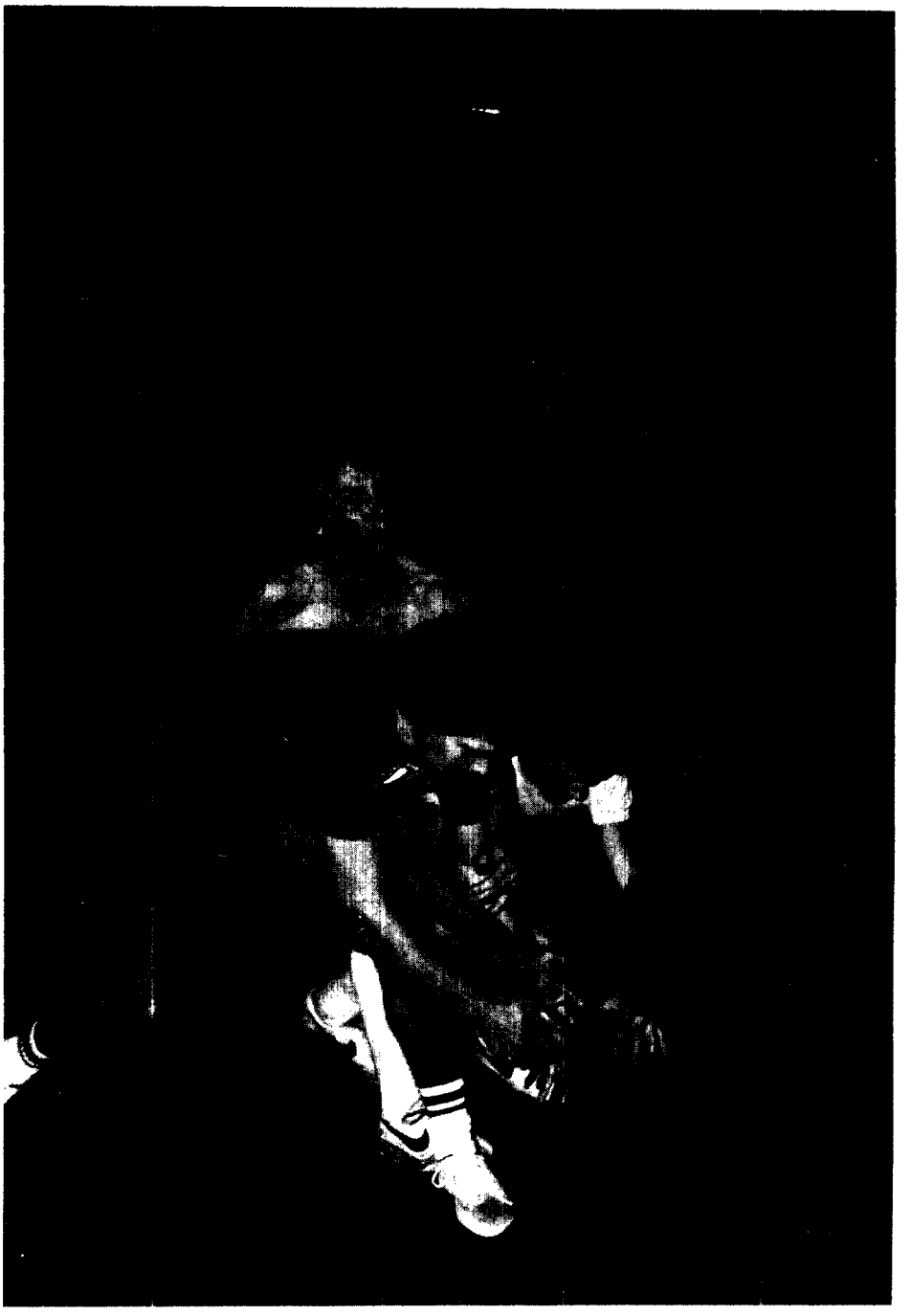
22.434 Management Engineering II — A continuation of 22.334, involving the application of scientific problem-solving techniques used in business organizations. The projects require research and detailed analysis, plus the preparation and presentation of technical reports.

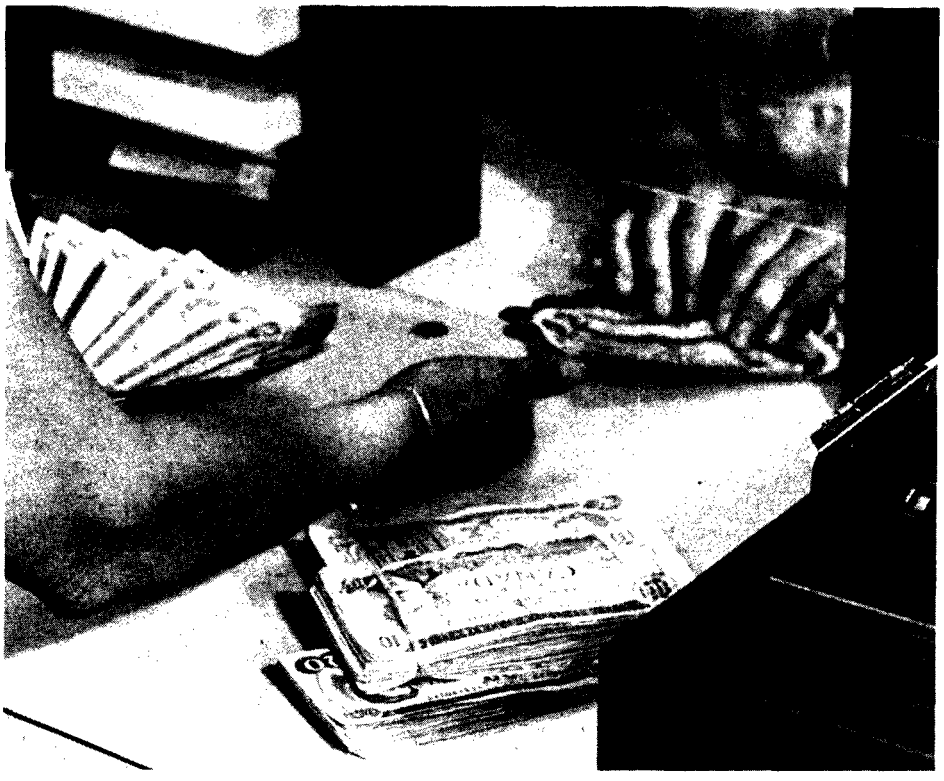
31.114, 31.214 Business Communication — The objective of this course is to develop students' written and oral communications skills. Students are taught to write the kinds of letters, memos and reports which they can expect to encounter in the computer industry. They are also taught the skills of speaking to small and large groups.

31.214 See 31.114

Faculty and Staff

M. Scriabin, M.B.A., Ph.D.,
Department Head
P. Abel, B.A. (Hons.), C.G.A.,
Program Head, Information Systems
D. Breckner, B.A., M.A.
R. Coolidge, Dipl.T.
K.E. Holden, R.I.A.
H. Holst, C.D.P.
G.T. Kidd, B.Sc.
R.B. Long, C.G.A.
F.J. Martin, F.L.M.I., C.D.P., B.A. (Hons.)
E.N. Newton, B.Voc.Ed.
M. Ramkay, B.Sc.
F. Senior, B.A. (Hons.), C.D.P.
C.P. Simmons, C.G.A.
K. Takagaki, B.A. (Hons.), R.I.A., C.D.P.
M.E. Turner, M.B.A., P.Eng.,
Senior Instructor
G.N. Weir, C.D.P.
A.Y.W. Wong, B.A.Sc., M.Eng., P.Eng.,
Senior Instructor, Service Courses to Engineering and Health Divisions
B.A. Wuhrer, B.A., M.Ed.
H.E.W. Wuhrer, C.D.P., C.M.C., Senior Instructor, Service Courses to Business Division





Financial Management

No enterprise can survive without means of funding and financial control and in modern-day business the techniques of financial management—financial planning, budget preparation and financial control—have gained increasing importance as management tools. BCIT students may specialize in insurance, accounting or finance.

Job Opportunities

Specialists in accounting commonly enter middle management positions in financial accounting, cost accounting, internal audit and budget preparation.

Graduates in finance are placed in a variety of positions in banks, trust companies, insurance companies and finance companies, as well as in the finance departments of businesses, industries and government. After gaining appropriate experience in an entry-level job, finance specialists may rise to the managerial level and beyond.

Opportunities in insurance include a variety of positions in underwriting, broking, adjusting and agency operations in the general insurance field. Life insurance companies also require agents and underwriters. Pensions, trusts and financial planning are other possibilities.

The Program

Following a year of general studies in business, students will enter one of three options: Insurance, Accounting or Finance.

The **Accounting Option** is concerned with accounting systems, financial reporting and auditing. The second-year courses in this option build upon the accounting, data processing and computer systems fundamentals introduced in the first year with increased concentration on financial and cost accounting.

The **Finance Option** deals with the intricacies of funding business operations. In addition to a thorough grounding in financial accounting, students in this option make an in-depth study of financial decision-making in their second year of the Financial Management program.

The **Insurance Option** trains students in the methods in which groups and individuals in our society seek to protect themselves against risks such as fire, theft, accidents, early death or prolonged old age. The general studies courses in first year are followed by specialized courses in the principles of insurance, claims losses, adjustments, and estate and insurance planning. **This option has been temporarily suspended due to funding.**

Prerequisites

Graduation from the Selected or Combined Studies Program with Algebra 11. An inquiring and logical mind and a capacity for hard work are important personal qualities, as is the ability to work well with others.

Professional Accreditation

The accounting profession, through its professional bodies recognizes a wide variety of accounting subjects offered in the Program. The Canadian Institute of Chartered Accountants, The Canadian Certified General Accountants' Association, The Canadian Credit Institute, and the Society of Management Accountants give credit for various subjects.

In addition to the professional bodies, universities will offer credit for subjects taken in the program where students wish to continue their training and qualify for a university degree.

Course of Studies

Year 1	Term 1	Clrm hrs/wk
10.000	Management I	3
10.010	Economics I	3
14.050	Introduction to Data Processing	4
16.100	Selected Topics in Finance	3
16.140	Accounting I	5
20.191	Marketing I	3
22.116	Business Mathematics	5
31.116	Business Communication	4
	Library and Research	5
		35

Year 1	Term 2	
10.001	Management II	3
10.011	Economics II	3
14.052	Computers in Business	3
16.145	Credit and Collections	3
16.240	Accounting II	5
20.291	Marketing II	3
22.216	Business Statistics	5
31.216	Business Communication	4
	Library and Research	6
		35

Year 2	Term 3	Acctg	Fin	Ins*
10.020	Organizational Behavior	3	3	3
10.081	Business Law I	3	3	3
14.359	Mini/Micro Computer Software Systems	3	3	3
16.341	Cost and Managerial Accounting	4	—	—
16.346	Auditing	4	—	—
16.347	Financial Accounting	5	5	5
16.361	Finance	4	4	4
16.365	Money and Banking	--	4	—
16.366	Security Analysis	--	4	—
16.370	Projects in Industry	4	4	4
16.380	Principles of Insurance	--	—	5
16.382	Claims, Losses and Adjustments	--	—	3
	Library and Research	4	4	4
		34	34	34

Year 2	Term 4	Acctg	Fin	Clrm hrs/wk Ins*
10.081	Business Law II	3	3	3
16.490	Mini/Micro Computer Software Systems Applications	4	4	4
16.441	Cost and Managerial Accounting	4	—	—
16.446	Auditing	4	—	—
16.450	Taxation	3	3	3
16.447	Financial Accounting	5	5	5
16.461	Finance	4	4	4
16.465	Money and Banking	—	4	—
16.466	Security Analysis	—	4	—
16.470	Projects in Industry	4	4	4
16.480	Principles of Insurance	—	—	4
16.484	Estate and Insurance Planning	—	—	4
	Library and Research	4	7	7
		35	35	35

**Subject to sufficient enrollment and Ministry of Education Approval.*

Subject Outlines

10.000 Management I — An orientation to the nature of business in the free enterprise system with an emphasis on organization for management. The functions of management, planning and organizing are thoroughly examined, as well as giving attention to topics such as management information systems, the role of the committee and the development of the theory of management philosophy. This leads to the course on administrative practices.

10.001 Management II — This course gives further insight into the functions and practice of management and includes a study of the function of directing in all its aspects of leadership, communication and motivation, followed by an analysis of the control function. Additional topics such as supervisory and administrative operations are covered. A brief introduction is also given to the topic of industrial relations.

10.010, 10.011 Economics — The aim of the course is to develop an understanding of the organization and operations of the Canadian economy. Students analyze demand and supply, how production costs vary and how prices are determined in different markets (micro-economics). The theoretical tools of the economist are used to explore the concepts of national income, money and banking, international trade, employment, inflation and growth (macro-economics). An appreciation of the relation between economic theory and economic policy is provided.

10.011 See 10.010

10.020 Organizational Behavior — The study of all factors that either influence or are influenced by people at work. The course will focus on macro factors such as organizational structure, technology and environment; group factors such as conflict and decision making; and micro or individual factors such as attitudes, perception and motivation.

10.080, 10.081 Business Law — A study of legal rules and principles which guide decisions involving the law of contracts, including the sale of goods and negotiable instruments, as well as the business associations of agency, partnership and companies.

10.081 See 10.080

14.050 Introduction to Data Processing — Training in basic data processing principles to develop recognition of the possible application of these principles in industry. The principal functions of data processing will be illustrated and practised with an H.P. minicomputer operating interactively. Elementary computer programs will be written and tested on the computer. Use of flow-charting and elementary data processing systems design will illustrate the achieving of data processing objectives. Industrial relations is also introduced.

14.052 Computers in Business — For those people who are not specializing in data processing, a look is given at the types of computer systems currently in use in business. Topics include computer hardware and software development, program preparation (students will code and execute a COBOL program in this section), input/output media and devices, data centres, operating systems, controls in computer systems, installing a computer and current trends in the computer industry.

14.182 Office Equipment and Systems — A course to develop practice in solving business problems on electronic calculators. The course also includes lab exercises in structuring a coding system, forms analysis and control and design of business forms.

14.359 Mini/Micro Computer Software Systems — Students will receive instruction and practice in the use of commercially available microcomputer software systems and will use these programs in the solution of business problems. Typical programs will involve word processing, electronic worksheets, data base management and business graphics.

16.100 Selected Topics in Finance — In this course the following subjects will be introduced: (a) Risk Management: methods for handling risk in business. (b) General Insurance; policies, products, marketing, underwriting, adjusting and accounting. (c) Estate Planning: life insurance, pensions, annuities, RRSPs and wills. (d) Investments; objectives, alternatives, markets, trading and indices.

16.140, 16.240 Accounting — Basic accounting procedures; closing the books; adjustments; working papers; merchandise operations; statement and ledger organization; special journals; forms of business organization; accounting principles; introduction to cost accounting; analysis of financial data; working capital; departmental and branch operations; consolidations.

16.145 Credit and Collections — Study of various types of credit and their use by retail businesses, financial institutions, commercial enterprises and consumers. Includes sources of information, credit policy and control and collection techniques.

16.240 See 16.140

16.341, 16.441 Cost and Managerial Accounting — The accountant's role in the organization; major purposes of cost accounting; cost-volume-profit analysis; job-order accounting; budgeting; responsibility accounting; standard costs; direct costing; relevant costs; capital budgeting; cost allocation; joint and by-products; process costing; payroll, factory ledgers; transfer pricing.

16.346, 16.446 Auditing — Basic auditing procedures. Features of the internal control system. The audit program. Statutory audits, government audits, internal audits. The audit routine as applied to cash, inventory, accounts receivable and sales, fixed and other assets, accounts payable and purchases, income and other taxes and expenses. Specialized audit routines.

16.347, 16.447 Financial Accounting — Review of accounting principles and procedures and the preparation of financial statements. In-depth study of asset, liability and shareholders' equity accounts and their relationship, where applicable, to income measurement. Other specific studies include income tax allocation; accounting for changes in procedures, estimates and errors; statements from incomplete data; statement of changes in financial position; and fair value and price level adjusted statements.

16.361, 16.461 Finance — An in-depth study of the finance function within a corporation. The techniques which are necessary to make decisions under varying conditions and the theoretical framework upon which these techniques are built; methods for raising and utilizing intermediate and long-term funds; capital budgeting; working capital management; dividend policy; financial institutions; business failure; and international finance.

16.365, 16.465 Money and Banking — The study of money and money substitutes, supply of currency, creation of credit; functions and uses of money; practices, policies, functions and services of commercial banks; central banking and

monetary control; objectives and techniques of monetary policy and debt management; financial assets and financial markets; money and the international economy.

16.366, 16.466 Security Analysis — Techniques and principles of security analysis; valuation of securities; analysis of risks inherent in all types of security investments. Emphasis will be placed on the investment setting, the securities market, financial statement analysis, investment timing and portfolio analysis of both individual and institutional investors.

16.370, 16.470 Projects in Industry — An introduction to the use of quantitative analysis techniques for making business decisions. In the spring term, these principles are used in solving financial management problems in selected businesses and industrial firms under the supervision of faculty members.

16.380, 16.480 Principles of Insurance — An introduction to basic insurance principles covering costs and benefits; risk and its management; legal framework; major fields of insurance; origins and development of insurance in B.C. and Canada; structure of the insurance industry and its regulations; documentation and re-insurance; automobile, property and casualty insurance; arson and loss prevention.

16.382 Claims, Losses and Adjustments — This course examines insurance claims and adjustments. It consists of legal background, torts and contracts; rights and obligations of parties involved; roles and duties of adjuster and insured; ICBC claim centre operation; independent adjusters and claims departments; policies, conditions, proof of loss, co-insurance and apportionment of loss. Property and Marine claims adjusting are also covered.

16.441 See 16.341

16.446 See 16.346

16.447 See 16.347

16.450 Taxation — An introductory course dealing with all aspects of taxation in Canada. Municipal, provincial and federal taxation will be covered. Specific topics will include income tax, sales taxes and customs and excise taxes.

16.461 See 16.361

16.465 See 16.365

16.466 See 16.366

16.470 See 16.370

16.480 See 16.380

16.484 Estate and Insurance Planning — How to plan for contingencies of death, disability and retirement. The course includes: instruments of planning; wills; life insurance; pensions; RRSP's; annuities; term, whole life and endowment insurance; Canada Pension Plan; functions, licensing and ethics of agents; actuaries; mortality tables and rate schedules; policy and application; structure and regulation of industry.

16.490 Mini/Micro Computer Software Systems Applications — a continuation of the instruction and practice started in Mini/Micro Computer Software Systems (14.359) with the emphasis on the solution of practical problems. It is expected that the course will develop a level of familiarity with the programs such that the students will use them in other course areas.

20.191, 20.291 Marketing — This course is designed to give the administrative and financial management students a good understanding of the role of marketing in a firm. Marketing plays a critical role in any firm dealing in a product or service, and the decisions made by the marketing manager are reflected in the administrative and financial functions of a firm. The lab sessions will deal with typical marketing problems and students are exposed to the decision making process in marketing management.

20.291 See 20.191

22.116 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 as applied to the field of financial management.

22.216 Business Statistics — Major emphasis on descriptive statistics, including numerical and graphical presentation of data, measures of central tendency and dispersion, elementary probability, index numbers and time series. Introduction to inferential statistics through selected topics such as sampling, confidence limits of the mean, hypothesis testing and simple linear regression.

31.116, 31.216 Business Communication — The objective of this course is to develop the kinds of communications skills needed by graduates of the Financial Management Technology. To this end, students will be taught to write effective letters, memos and reports. Students will also be instructed in the techniques necessary to conduct a meeting, an interview and to present a report.

31.216 See 31.116

Faculty and Staff

R.A. Cradock, B.Comm., M.B.A., R.I.A.
Department Head
R.C. Bell, B.A. (Econ.), C.G.A.
C.M. Briscall, B.Comm., M.B.A., R.I.A.,
Program Head
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J.R.H. Curtis, B.Comm., M.B.A., A.M.B.I.M.
R.J. Dolan, B.B.A., M.B.A.,
Program Head
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E.M. Iannacone, B.Comm., M.B.A., R.I.A.
R.W. Jackson, M.C.I., Chief Instructor
H.M.J. Lawson, B.Sc. (Econ.), M.B.A.
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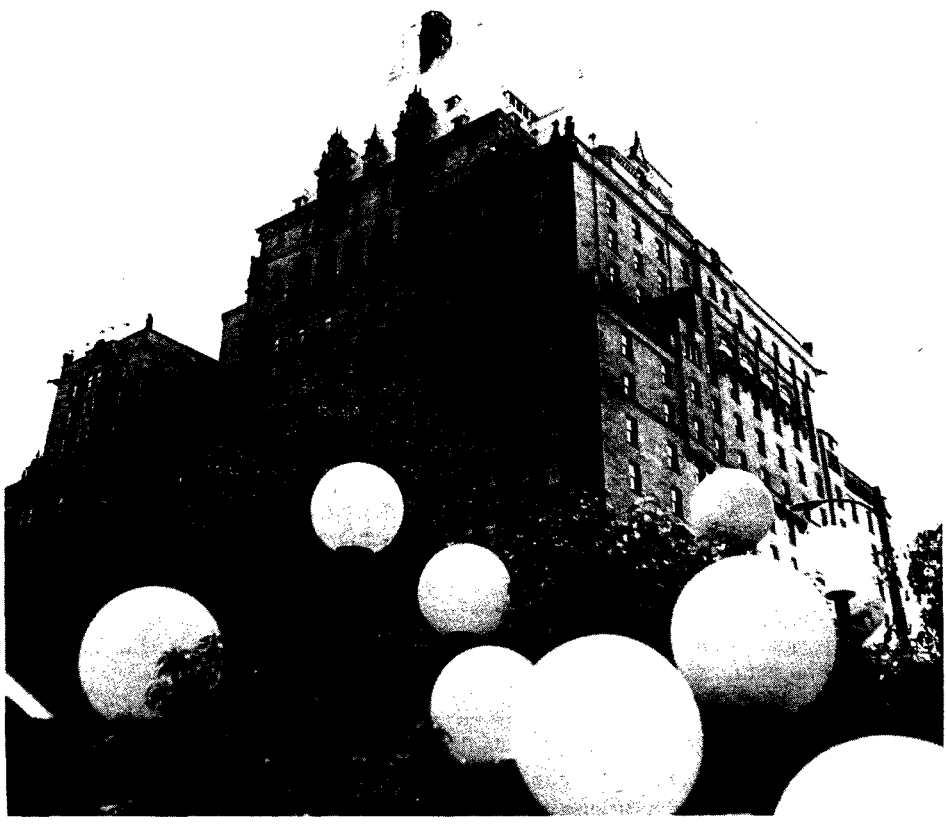
H.B. Yackness, B.Comm., M.B.A., C.A.,
Senior Instructor



Hospitality and Tourism Administration

Rapid expansion in the hospitality and tourism industry continues, resulting in a high demand for professionally educated staff who are able to plan for future requirements, and who are able to adapt to rapidly changing conditions.

Job Opportunities

Hotel, Motel and Food Service graduates are employed in hotels, motels, restaurants, department stores, industrial and airline catering firms, and in a wide variety of other organizations involved in food services and housing, such as hospitals and universities. Travel and Tourism graduates may find employment in travel agencies, with tour operators, with surface or air transportation companies, or with government agencies involved in travel promotion.

The Program

Students enter a common first year, heavily oriented to general business management subjects applied, where practical, in a hospitality and tourism industry setting. The balance of the first year program provides introductory courses directly related to the hospitality and tourism field. At the end of first year students will choose to continue in second year in either the **Hotel, Motel and Food Service** option, or the **Travel and Tourism** option. However, there may be a limited number of seats in the Travel and Tourism option. Regardless of option selected, each student must complete a 500 hour work practicum in some aspect of the hospitality and tourism industry between date of registration and graduation.

Prerequisites

Graduation from the Selected or Combined Studies Program, with a C+ standing or better in English 12 and Algebra 11. High School graduates having completed successfully the Career Preparation Program (C.P.P.) in Hospitality and Tourism should so indicate on their B.C.I.T. application for possible special consideration.

Applicants should be reasonably familiar with the components, and careers available in the hospitality and tourism industry sectors. Preference may be given to applicants with some industry-related practical work experience.

Applicants should be good communicators and people-oriented, with a willingness to relate harmoniously and effectively with the public and fellow workers. Upon entering the industry they should be prepared to work irregular hours.

Informational meetings about the program and career opportunities in the hospitality and tourism fields, may be offered from February through June. Applicants may also be invited to an interview with a faculty member, and may be required to write a short essay outlining their reason for applying to the Hospitality and Tourism Technology.

Course of Studies

		Clrm
Year 1	**Term 1**	hrs/wk
10.010	Economics	3
14.050	Introduction to Data Processing	4
16.140	Accounting	5
16.145	Credit and Collections	4
18.101	Lounge Operations	3
18.102	Food Operations	2
18.111	Oral Communication	2
22.128	Business Mathematics	4
31.118	Business Communication	4
		31
Year 1	**Term 2**	
10.011	Economics	3
14.052	Computers in Business	3
16.240	Accounting	5
18.201	Food Preparation and Service	3
18.202	Food Operations	2
18.206	Rooms Management	5
18.231	Introduction to Tourism	3
22.218	Basic Management Engineering	3
31.218	Business Communication	4
		31

Hotel, Motel and Food Service

		Clrm
Year 2	**Term 3**	hrs/wk
18.302	Food and Beverage Management	2
18.305	Food Production and Service	6
18.313	Food and Beverage Cost Control	4
18.316	Human Relations	2
18.325	Marketing and Sales Promotion	5
18.330	Tourism Plant Design	4
22.318	Business Statistics	4
		27
Year 2	**Term 4**	
10.082	Fundamentals of Business Law	3
18.402	Food and Beverage Management	2
18.405	Food Production and Service	6
18.413	Hospitality Industry Accounting	4
18.416	Human Relations	2
18.425	Marketing and Sales Promotion	5
18.450	Directed Studies	7
18.500	Work Practicum	—
		29

Travel and Tourism

Year 2	**Term 3**	
18.320	Organizational Behavior	2
18.326	Travel Marketing	3

Year 2	Term 3 cont.	Clrm hrs/wk
18.340	Tourism Planning and Resources	4
18.341	Recreational and Resort Development	3
18.342	Transportation Modes	5
18.343	Tourism Destinations	3
20.130	Transportation Economics and Regulations	3
22.318	Business Statistics	4
		27

Year 2	Term 4	
10.082	Fundamentals of Business Law	3
18.413	Hospitality Industry Accounting	4
18.420	Organizational Behavior	2
18.426	Travel Advertising and Sales	3
18.441	Regional Tourism	4
18.442	Transportation Modes	5
18.443	Tourism Destinations	3
18.450	Directed Study	7
18.500	Work Practicum	—
20.131	Transportation Economics and Regulations	3
		34

Subject Outlines

10.010, 10.011 Economics — The aim of the course is to develop an understanding of the organization and operation of the Canadian economy. Students analyze demand and supply, how production costs vary and how prices are determined in different markets (micro-economics). The theoretical tools of the economist are used to explore the concepts of national income, employment, inflation and growth (macro-economics). An appreciation of the relationship between economic theory and economic policy is provided.

10.011 See 10.010

10.082 Fundamentals of Business Law — A study of legal rules and principles which guide decisions involving the law of contracts, including the sale of goods and negotiable instruments, as well as the business associations of agency, partnership and the company.

14.050 Introduction to Data Processing — Training in basic data processing principles to develop recognition of the possible application of these principles in industry. The major functions of data processing will be illustrated and practised with a minicomputer operating interactively. Elementary computer programs will be written and tested on the computer. Use of flow-charting and elementary data processing systems design will illustrate the achieving of data processing objectives.

14.052 Computers in Business — A look at the types of computer systems currently in use in business. Topics include computer hardware and software development, program preparation (students will code and execute a COBOL program in this section), input-output media and devices, data centres, operating systems, controls in computer systems, installing a computer and current trends in the computer industry.

16.140, 16.240 Accounting — Basic accounting procedures; closing the books; adjustments; working papers; merchandise operations; statement and ledger organization; special journals; forms of business organization; accounting principles; introduction to cost accounting; analysis of financial data; working capital; departmental and branch operations; consolidations.

16.145 Credit and Collections — Study of various types of credit and their use by retail businesses, financial institutions, commercial enterprises and consumers. Includes sources of information, credit policy and control and collection techniques.

16.240 See 16.140

18.101 Lounge Operations — This course covers the basic requirements needed to operate a lounge or bar successfully. Subject areas include layout and design; B.C. Liquor Act; liquor classification process; liquor control; bar systems. Practical mixology in preparation of cocktails, pouring techniques, garnishes and bar set up are also covered.

18.102, 18.202 Food Operations — Background of industry; sanitation; meal planning and menu preparation; selection of foods; purchasing methods; principles of food preparation; equipment layout and specifications; service of foods; menu writing, administrative requirements; organization of the catering department. The course also covers the development of basic skills, attitudes and knowledge required for the identification, handling and cooking of food items found on a restaurant menu; care and handling of tools and restaurant equipment; preparation of stocks, soups, sauces, seafoods, meats, vegetables and specialty items. Also includes an industry practicum. Cocktail lounge operations, including the care and handling of glassware, types of beverages, dispensing devices, inventory procedures and practical mixology sessions are also covered.

18.111 Oral Communication Skills — Speech construction; types of speeches; speaking before groups; introducing and thanking speakers, chairing meetings and interviewing; practice in preparation and delivery of talks to groups.

18.201 Food Preparation and Service — This course will develop the basic skills and techniques required for food preparation and service and will lay the groundwork for the more advanced second year course. It will enable the participants to operate kitchen equipment safely, apply sanitation procedures, read, follow, and prepare recipes, apply quality standards of food preparation, classify and prepare soups, stocks, sauces, fish and shellfish, meat, poultry, and breakfast items. Basic service techniques are also practiced.

18.202 See 18.102

18.206 Rooms Management — This course will be segmented into the two component parts of Rooms Operations: Housekeeping functions, and Hotel front desk operations. The housekeeping portion covers housekeeping organization and duties; control forms; supplies and equipment; specifications for purchasing equipment and linen; and laundry operations. The Hotel front desk operations section involves front office organization and psychology; materials, equipment and supplies; rooms salesmanship; reservations; registration and front office accounting for various size hotels; handling of cash and credit transactions; and processing accounts.

18.231 Introduction to Tourism — An introduction to the Travel and Tourism industry including why tourism is growing in domestic and international markets; functions and inter-relationships of the various industry sectors; major organizations and associations and their influence on tourism; and exploration of career opportunities in all facets of tourism; economic import of tourism and government initiatives in encouraging growth; current trends in travel; and social and environmental impacts of tourism.

18.302, 18.402 Food and Beverage Management — An exploration of the main facets of professional food and beverage operations through lectures, student projects and seminars. Functions of management, personnel and training, purchasing, menu management, food service systems (specialty restaurants, fast-food, airline catering, hospitals, employee feeding and contract catering) convenience foods, current and future industry trends, wines. Includes industry practicum.

18.305, 18.405 Food Production and Service — Research in food preparation to balance quality preparation with cost of production; testing of new products to evaluate the possibility of their uses in a practical production situation; menu planning; development of certain manipulative skills to permit students to be in a position to eventually train and supervise others; dining room service.

18.313 Food and Beverage Cost Control — Fundamentals of internal controls and information systems for food and beverage operations. The course covers techniques of effective purchasing, receiving and production; sales controls; food and beverage cost calculations; and the sales mix and its effect on costing. Course emphasis is on interpretation of data for effective and profitable decision-making.

18.316, 18.416 Human Relations — Systematic approach to the personnel problems in today's business organizations, including human needs and wants, motivation process, social systems, leadership, unions, management techniques, communication problems, staff hiring and appraisal, training and incentives. Lab discussions based on real-life cases help develop ability to make decisions upon critical analysis of facts available.

18.320, 18.420 Organizational Behavior — Organizational Behavior introduces the students to a psychological approach to administration through a study of the determinants of human behavior, personality, motivation, attitudes, perceptions, learning and leadership, and their application to the administrative process.

Organizational behavior examines the determinants of employee job performance and productivity within the organization; the effect of different patterns of formal organization on motivation; the effect of the different forms of informal organizations and leadership styles on organizational performance; and the satisfaction of individual needs within the organization.

18.325, 18.425 Marketing and Sales Promotion — This course serves to explore the relative positions of all components of the tourism industry — travel agent, tour operator, air or surface carrier, recreation facilities and accommodation. How and where they depend on each other, how they buy and sell between themselves, and finally, how they get their individual products or combined products to the market place.

18.326 Travel Marketing — Emphasis is on applying general marketing concepts and techniques to the Travel Industry, including government marketing agencies, air and surface carriers, tour operators, and travel agencies; how and where they inter-relate; consumer demand and competition to serve; produce definition and product packaging; consumer awareness of travel; marketing use of audio visual aids, are some of the topic areas that will be studied.

18.330 Tourism Plant Design — A study of language in the building and construction fields, as related to physical design; blueprint reading elements and design interpretation; zoning and municipal bylaw conformity; fundamentals of building, room design and esthetics; building maintenance and preventative maintenance factors; use of color, light and sound in themes and atmosphere.

18.340 Tourism Planning and Resources — An intensive look at the direction and impacts of tourism. The course will look at the past and future of tourism considering economic strategies; distinguishing between conceptual planning and detailing a master plan; analyzing the marketing function; understanding the impact of tourism on other resource industries, and conversely impacts of other industries on tourism; short and long term action planning. Course will also consider human resource needs in tourism planning.

18.341 Recreational and Resort Development — This course explores the need and the resources necessary for establishing a strong regional attraction for the recreational, sport and vacation traveller. Topics include development of resort locations; fishing, hunting and sport resorts; ski and water resorts; seasonal developments; promotion of tourist regions depending on recreational travel. While the emphasis may be strongly B.C. in-bound, popular resort areas including Hawaii, Florida, Mexico and Nevada will also be discussed.

18.342, 18.442 Transportation Modes — This course initially covers transportation modes such as ferries, cruise ships, bus, rail, rental cars and taxis.

A major emphasis in this course is on air travel and the ability to quote both normal and special fares and produce schedules and tickets for airline customers. The course will also teach the student the use of ticketing terminology, and passenger rules and regulations.

18.343, 18.443 Tourism Destinations — This course provides a survey of the major tourism destinations frequented by the travelling public. These destinations include North and South America, Europe, the South Pacific and Pacific Rim.

Subject areas include historical and geographical knowledge of the areas as well as the following: culture, dress, and language; social traditions; economic conditions and currency; foods; industry and educational standards; and tourist attractions.

18.402 See 18.302

18.405 See 18.305

18.413 Hospitality Industry Accounting — Preparation, interpretation and analysis of balance sheets and profit and loss statements; budgeting and forecasting; feasibility studies; financing and cash flow; cost-volume-profit analysis; investment decision-making.

18.416 See 18.316

18.420 See 18.320

18.425 See 18.325

18.426 Travel Advertising and Sales — This course is an extension of Travel Marketing, with greater emphasis on promotion, personal selling techniques and salesmanship. Topics will include making personal client presentations; services and itinerary planning; dealing with media and advertising agencies; developing advertising pieces for creative promotion; communication of the printed work and pictures; understanding client behaviors; implications of budget on the selling function.

18.441 Regional Tourism — This course is geared toward marketing British Columbia specifically. The Provincial Tourist Regions will be highlighted, with emphasis on developing ideas and implementation strategies for each region. Included in the course will be the areas of accommodation availability, transportation, present and proposed tourist facilities, sport, recreational and vacation opportunities, and affected industries in each area. Discussion will also include areas immediately adjacent to B.C.'s regions, such as Alberta, N.W.T., Alaska, and appropriate U.S.A. States.

18.442 See 18.342

18.443 See 18.343

18.450 Directed Studies — One day a week will be ascribed for an independent study project. It is expected that some Instructor or Coordinator input will be generated for up to three hours per week during the term to set direction and tone for projects.

18.500 Work Practicum — During the first month of Term I, Year 1, each student will receive a "Career Passport of Hospitality & Tourism Experience" in which will be recorded practical work experience. The objective of the practicum is to provide each student with a minimum of 500 hours of proven work experience in the industry prior to graduation. Some credit may be given for work experience prior to registering at BCIT. No grade is assigned to this practicum.

20.130, 20.131 Transportation Economics and Regulation — This course will deal with transport costing economic regulation and other types of regulation. The modes involved will include air, highway, rail and water. The course will emphasize the economics, liabilities and the regulations of passenger travel and passenger possessions (baggage). An overview of cargo, including dangerous commodities, will also be given. Topics include cartels and conferences; governmental intervention; intergovernmental cooperation; United Nations Committees concerning travel; and aspects of immigration and customs.

20.131 See 20.130

22.128 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 as applied to the hospitality-tourism industry.

22.218 Basic Management Engineering — Approaches to problem-solving and work simplification, with particular application to hotel and restaurant operations. Includes method study, some measurement techniques, layout and systems concepts.

22.318 Business Statistics — Major emphasis on descriptive statistics, includ-

ing 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, hypothesis testing and simple linear regression.

31.118, 31.218 Business Communication — This is an applied business communications course which concentrates on techniques and applications of written and spoken business communications. The discussion topics, explanations, illustrations and assignments are related as closely as possible to the hospitality and travel industries. The emphasis of the course is on the composition and analysis of writing a wide variety of business letters and reports.

31.218 See 31.118

Faculty and Staff

M.M. Coltman, M.B.A., *Department Head*
R. Agon
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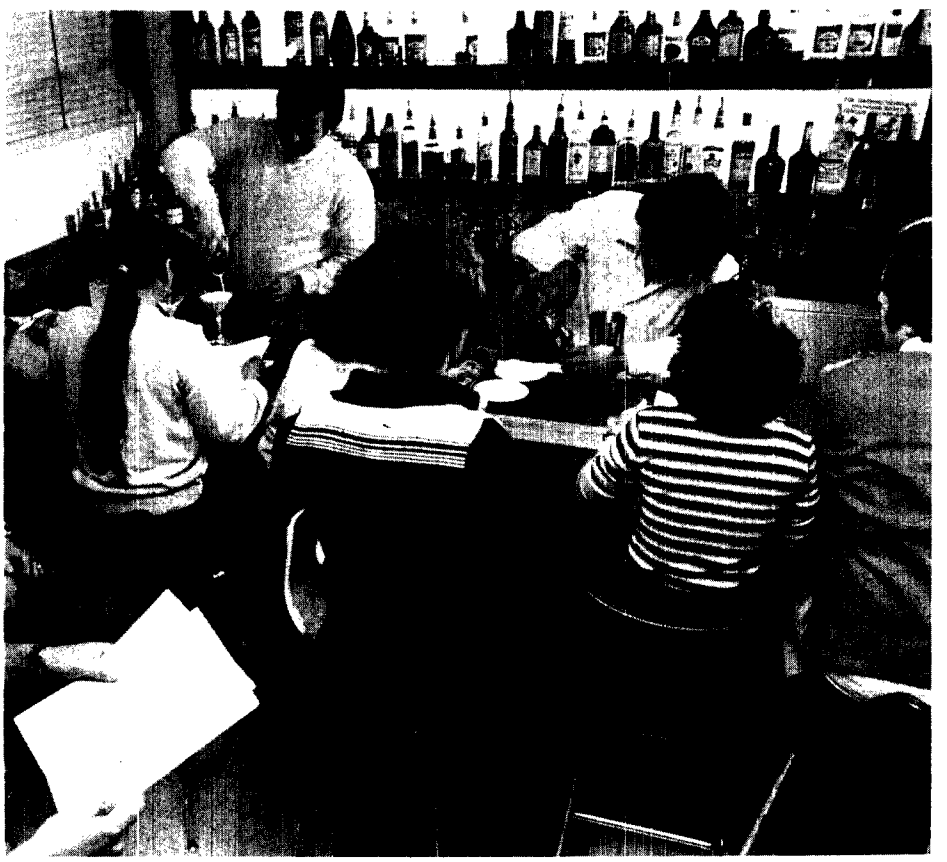
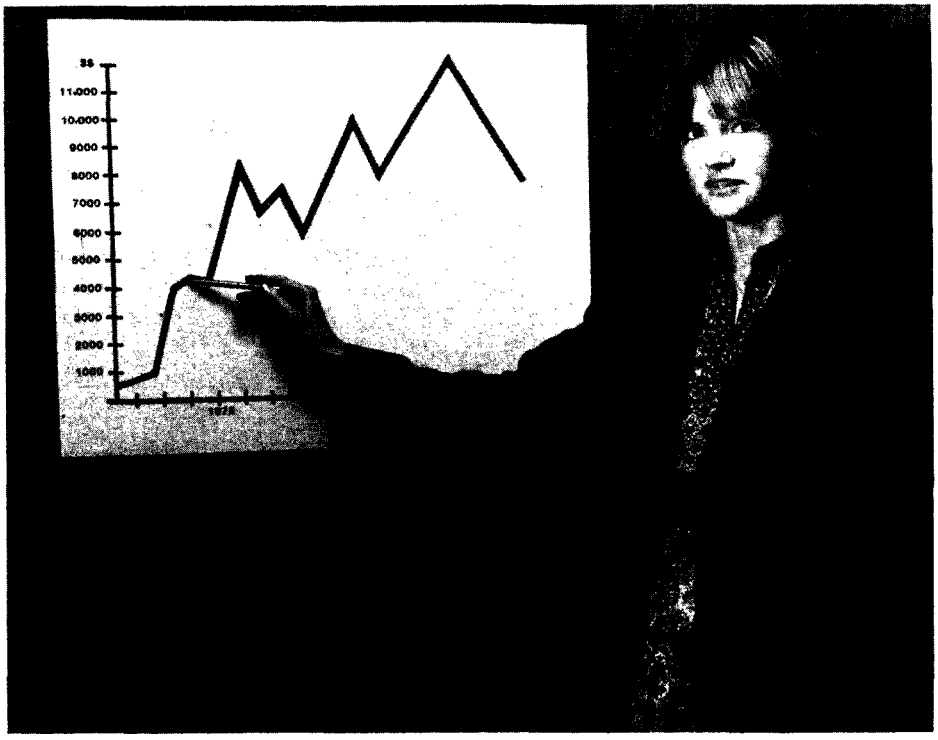
F.N. Daniels
B. Ellsworth
B.J. Fernandes
K.F. Krueger, Program Head
L. Lous
C. Morelli
R. Oliver
P.F. Renner, Dipl.Ad.Ed., Dipl.Couns.Psy., M.A. ED.





Marketing Management

Marketing is the task of making available what a firm or organization can offer to satisfy the needs of its customers or patrons. This means that people with marketing skills are needed in a wide range of organizations to cover many different functions. Manufacturers, professional services, and non-profit institutions each depend on marketing to sustain a viable, efficient operation.

Marketing managers concentrate on product development, market research, sales or promotion functions, or they may find their job requiring the broad skills of all these areas.

The Marketing Technology is designed to equip the graduate with a solid generalist background, **plus** allowing the student to concentrate on the unique skills associated within various specific sectors of our economy. These include the technical consumer or industrial product/service sector; the Real Estate industry; the international trading sector; or the business communications industry.

Job Opportunities

The **Technical Sales and Marketing** program leads to career positions in manufacturing, wholesale, and retailing firms, with an emphasis on advanced technology products and services.

The **Real Estate Studies** program prepares the graduate for sales, agent, mortgage brokerage, appraisal, property management, investment analyst positions. Graduates may choose to pursue either licenced or non-licenced positions within the Real Estate industry.

The **International Business** program provides the technical background for entry into financial institutions, transportation firms, or trading houses. Extensive apprenticeship may be required for advancement to a management position.

Advertising and Sales Promotion graduates are employed in advertising agencies, broadcasting companies, publishing firms, and in-house promotion operations.

The Program

In the first year, all Marketing Technology students complete the same course of studies covering general business and economic principles. The second year program offers specialization. The **Technical Sales and Marketing** emphasizes industrial sales, new product development and entrepreneurship. **Real Estate Studies** addresses residential and commercial property sales and investment analysis skills. **International Business** focuses on marketing, financing and transport of import and export goods and the **Advertising and Sales Promotion** courses develop creative communication skills and campaign planning.

Prerequisites

Graduation from the Selected or Combined studies program with Algebra 11 and English 12 with a C+ standing or better. Completion of grade 11 & 12 science courses enhance the applicants success in the program.

Business experience and/or other successful post-secondary education greatly strengthen applications. Admission may be granted to mature students provided they have completed high school at least 2 years prior to date of entry; or can complete pre-entry preparatory programs, or have acquired prerequisite work experience. Candidates must state program preference when applying for admission to the Marketing Technology.

Course of Studies

Technical Sales and Marketing Program

Year 1	Term 1	Clrm. hrs/wk
10.005	Management Fundamentals	3
10.010	Economics (micro)	3
14.050	Introduction to Data Processing	3
16.140	Accounting	5
20.180	Marketing	3
20.175	Salesmanship	3
22.120	Business Math	4
31.120	Business Communication	4
		28
	Term 2	
10.011	Economics (macro)	3
10.045	*Human Resource* Management	4
14.052	Computers in Business	3
16.240	Accounting	5
20.280	Marketing	3
20.223	Sales Management	3
22.220	Business Statistics	4
31.220	Business Communication	4
		29

Year 2	Term 3	Clrm. hrs/wk
10.080	Business Law	3
16.342	Marketing Management Accounting	5
20.322	Marketing Planning	4
20.371	Advertising and Sales Promotion	4
20.382	Marketing Research	3
Elective A — Industrial Sales		
20.324	Industrial Marketing	3
20.325	Distributive Systems	3
Elective B — Hi-Tech Marketing		
20.326	Market Strategies	3
20.327	International Trade	3
	New	
Elective C — Enterprise Development		
20.328	Principles of Small Business Management	3
20.329	Case Studies of Entrepreneurship	3
		25
	Term 4	
10.081	Business Law	3
16.442	Marketing Management Accounting	5
20.422	Quantitative Methods/ Computer Applications in Marketing	4
20.482	Marketing Research	3
20.490	Directed Studies	6
Elective A — Industrial Sales		
20.424a	Advanced Sales Techniques	6
20.425b	Industrial Sales Practicum	6
		33

Year 2	Term 4 cont.	Clrm hrs/wk
Elective B — Hi-Tech, Marketing		
20.426a	Product Marketing	3
20.426b	Hi-Tech Information Systems	3
20.427	Product Development	3
		30
Elective C — New Enterprise Dev.		
20.428	Financing New Ventures	3
20.429	Business Planning Practicum	3
		27

Applied Real Estate Studies Program

Year 2	Term 3	Clrm. hrs/wk
10.080	Business Law — Property	3
16.342	Marketing Management Accounting	5
20.350	Real Estate Management (Pre-licence)	4
20.351	Economics of Real Property	4
20.353	Real Estate Investment Analysis	4
20.371	Advertising and Sales Promotion	4
20.382	Marketing Research	3
		27
	Term 4	
10.081	Business Law — Property	3
16.442	Marketing Management Accounting	5
20.450	Real Estate Management (Pre-licence)	4
20.451	Appraisal — Real Property	3
20.454	Real Estate Finance	3
20.482	Marketing Research	3
20.490	Directed Studies	6
		27

International Business Program

Year 2	Term 3	Clrm. hrs./wk
10.080	Business Law	3
16.342	Marketing Management Accounting	5
20.322	Marketing Planning	4
20.360	Introduction to International Business	4
20.361	Transportation in International Trade	4
20.371	Advertising and Sales Promotion	4
20.382	Marketing Research	3
		27
	Term 4	
10.081	Business Law	3
16.442	Marketing Management Accounting	5
20.422	Quantitative Methods/ Computer Applications in Marketing	4
20.462	International Marketing Management	4
20.463	Financing International Trade	3
20.482	Marketing Research	3
20.490	Directed Studies	6
		28

Advertising and Sales Promotion Program

Year 2	Term 3	Clrm. hrs/wk
10.080	Business Law	3
16.342	Marketing Management Accounting	5
20.322	Marketing Planning	4
20.374	Principles of Advertising	4
20.376	Creative Design	4
20.377	Media Buying	4
20.382	Marketing Research	3
		27
	Term 4	
10.081	Business Law	3
16.442	Marketing Management Accounting	5
20.422	Quantitative Methods/ Computer Applications in Marketing	4
20.477	Advertising Internship	10
20.478	Promotional Marketing	3
20.482	Marketing Research	3
		28

Subject Outlines

10.005 Management Fundamentals — An orientation to the nature of business in the private enterprise system, embracing forms of business ownership, organization, leadership, management techniques and business elements of production. Typical cases taken from industry are studied to encourage students to think and decide for themselves.

10.010, 10.011 Economics — The course aim is to develop an understanding of the organization and operation of the Canadian economy. Students analyze demand and supply, how production costs vary, and how prices are determined in different markets (micro-economics). The theoretical tools of the economist are used to explore the concepts of national income, employment, inflation and growth (macro-economics). An appreciation of the relation between economic theory and economic policy is provided.

10.011 See 10.010

10.045 Human Resource Management — An introduction to the major personnel and industrial relations programs applicable to the British Columbia workplace with emphasis on the value of the worker and the overall effectiveness of modern human resource management. It develops understanding of the skills required for selection interviews, performance appraisals, compensation reviews, labour contract negotiations, training and development programs, grievance and collective agreement administration and it reviews relevant employment law.

10.080, 10.081 Business Law — A study of legal rules and principles which guide decisions involving the law of contracts, including the sale of goods and negotiable instruments as well as the business associations of agency, partnership and companies.

10.081 See 10.080

14.050 Introduction to Data Processing — Training in basic data processing principles to develop recognition of the possible application of these principles in industry. The principal functions of data processing will be illustrated and practised with an H.P. minicomputer operating interactively. Elementary computer programs will be written and tested on the computer. Use of flow-charting and elementary data processing systems design will illustrate the achieving of data processing objectives.

14.052 Computers in Business — For those people who are not specializing in data processing, a look is given at the types of computer systems currently in use in business. Topics include computer hardware and software development, program preparation (students will code and execute a COBOL program in this section), input/output media and devices, data centres, operating systems, installing a computer and current trends in the computer industry.

16.140, 16.240 Accounting — Basic accounting procedures, closing the books, adjustments, working papers, merchandise operations, statement and ledger organization, special journals, forms of business organizations, accounting principles, introduction to cost accounting, analysis of financial data, working capital, departmental and branch operations, consolidations.

16.240 See 16.140

16.342, 16.442 Marketing Management Accounting I and II — Here, emphasis is placed upon profit planning, pricing strategies, and control in the marketing environment. Also studied are cost-accounting control concepts and applications, inventory management techniques, cash and capital planning techniques and revenue reporting systems. The course ends with a study of the implications for managerial decision-making of accounting reporting methods and policy.

16.442 See 16.342

20.175 Salesmanship — Introduction to professional selling. Emphasis on practical problems of locating and qualifying prospects, use of depth approach and improving sales preparation and organization. Some examination also given to improving interpersonal communications in non-selling situations.

20.180, 20.280 Marketing — An introduction to the marketing environment and marketing institutions: detailed study of the basic marketing functions, marketing research, product planning, selection of trade channels, merchandising, advertising, sales promotion and salesmanship. Embraces marketing of consumer goods, as well as industrial goods.

20.223 Sales Management — General principles of sales management. Emphasis is given to the human resource, with stress placed on selection, assimilation, training and supervision. Also, examination of sales research, planning, organization and analysis is made. The course finishes with a discussion of sales management ethics.

20.280 See 20.180

20.322 Marketing Planning — Developing a formal marketing plan including situation analysis, market and competitive conditions research, objective setting and action scheduling.

20.324 Industrial Marketing — An examination of the complex purchase process faced by a company in selling to industry, government and institutions. Alternative distribution and pricing strategies are considered. Emphasis is on understanding the growing British Columbia industrial base.

20.325 Distributive Systems — A study of the channels and supporting infrastructure necessary to move products from manufacturer to consumer including thorough coverage of new technology applications to retailing and merchandising systems.

20.326 Market Strategies — The development of strategies suited to high technology products and services to achieve productivity improvement.

20.327 International Trade — An examination of import/export procedures, particularly in relation to sophisticated technology products and services. Trading patterns and forecasts are thoroughly covered.

20.328 Principles of Small Business Management — Examination of the planning stages involved in starting a new business including market, financial and legal feasibility requirements.

20.329 Case Studies in Entrepreneurship — An analysis of both successful and unsuccessful ventures to reveal the role of the entrepreneur.

20.350, 20.450 Real Estate Management — The real estate function includes law, estates and interests in land and the personal and business management decision process. The economic characteristics of urban real estate and the market, city growth and development, locational factors in influencing the determination of land use and ownership, institutional lenders, the mortgage market and the functions of the real estate agent, salesman and appraiser are covered. This is a credit course recognized by the Real Estate Council of British Columbia and the Department of Real Estate Studies at UBC. It exempts the student entering the real estate brokerage business from the salesman's pre-licensing course.

20.351 Economics of Real Property — This course lays the foundation for a sound education in property management. It thoroughly familiarizes the student with the basic theories and techniques of managing investment real estate. On completion of the course, the student will have an insight into the long-range welfare of the investment property and be familiar with the day-to-day skills necessary to manage residential and commercial properties. Students obtain credit points for this course toward the designation of Certified Property/Manager with the Institute of Real Estate Management. The course will cover all responsibilities of the property manager, such as management agreements, merchandising rental space and leasing, controlling the physical investment and maintenance real estate economics, finance and valuation, neighborhood analysis, property analysis and the apartment management. Students will gain an overall view of the many types of property in which management opportunities abound.

20.353 Real Estate Investment Analysis — The purpose of this course is to present the tools and techniques of analysis that can 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 the mathematics of finance is central to the analysis of the situation, the analysis of alternative course of action and the comparison of costs and benefits, both today and in the future.

20.360 Introduction to International Business — International environments, basic concepts in foreign trade, the direction and volume of Canadian exports, framework of international business, financing of foreign trade, foreign exchange, international banking. Importance of Pacific Rim countries to Canadian exports, role of provincial and federal government in export development, tourism.

20.361 Transportation in International Trade — the mechanism involved in transporting goods from the seller to buyer; documents required for international transactions; modes of transportation and comparisons; freight rates and structures; inland transportation problems; import requirements; tariff classifications; shipping terms and trade terminology; marine cargo and insurance, clauses.

20.371 Advertising and Sales Promotion — Advertising philosophy and purpose; organization of the advertising function; relationship of advertising to other business divisions; advertising planning; the business management of advertising. The creative process, research, media—newspaper, radio, TV, magazines, direct mail, outdoor, public relations. Copy, layout, art, strategies and campaigns, production and communications, controls, evaluating results. The course is designed to make the student a competent advertising critic.

20.373 Advertising and Sales Promotion Management — This course identifies the factors involved in carrying out advertising plans from the viewpoint of clients, agencies and media organizations. The anatomy of advertising plans is examined, with primary focus on the development, execution and control of total campaigns. Emphasis is placed on organizational considerations, developing advertising budgets, objectives and strategies for both creative design and media planning, the implementational stages and the campaign support functions of sales promotion.

20.374 Principles of Advertising and Sales Promotion — This course examines the evolution and functions of advertising and sales promotion within the contexts of society and the business system. The topic is surveyed rigorously, with consideration being given to its application in the fields of retailing, wholesaling, manufacturing, professional and industrial activities.

20.376 Creative Design — Provides a practical insight into the implementation of creative strategies. The use of freelance creative resources is discussed, illustrating the means by which the manager may translate creative concepts into publication or broadcast-ready material. In a practical sense the course will concentrate on developing copywriting skills for the individual student.

20.377 Media Buying — Emphasis is placed on development and execution of the media plan. Close contact is maintained by the students with the agency media buyers and other industry factors to ensure a practical direction to the course. Quantitative media planning techniques are evaluated in light of most recent computer applications. The main objective of this course is to provide marketable skills in media planning and buying to qualify students for career entry consideration in the advertising agencies.

20.382, 20.482 Marketing Research — This course examines the basic approaches to marketing research. It discusses the techniques and tools of this research and relates these tools to the decision-making process. Emphasis is placed on the use of marketing research in the total marketing decision concept. Special applications of marketing research simulated real-life situations are examined.

20.422 Quantitative Methods/Computer Applications in Marketing — An examination of decision support systems now available utilizing mathematical modelling methods, data bank access, and computer based information processing.

20.424a Advanced Sales Techniques — Professional selling skills utilizing buyer behavior, product knowledge, time management and sales call planning tools.

20.425b Industrial Sales Practicum — Field work experience with the sales force of a sponsoring firm. Full evaluation of on-the-job performance is included.

20.426a Product Marketing — Covers the channels and supporting infrastructure necessary to market consumer related high technology products. Involves setting up a model distribution network.

20.426b Hi-Tech Information Systems — Examines the hardware/software systems,

data sources, and resources available to marketers of high-tech products in gathering and dispensing needed information.

20.427 Product Development — A study of effective processes for generating product ideas, design planning, performance evaluation and market testing. Commercialization of highly innovative products is emphasized.

20.428 Financing New Ventures — Introduces various legal forms, tax matters and sources of financing which it is essential that independent business operators understand.

20.429 Business Planning Practicum — Involves the student in the detailed process of preparing a business prospectus. The student is required to demonstrate the legal and financial feasibility of a selected new venture.

20.450 See 20.350

20.451 Appraisal - Real Property — The course is designed for use by appraisers, real estate brokers, lenders, builders and assessors. On completing this introductory course, the student will have learned how to apply the principles and techniques to actual residential appraisal problems. To become a professional appraiser, the student completing this course must add meaningful practical appraisal experience and further advanced training. The material covered will include such topics as principles of real estate, elements of urban land economics, nature and principles of real estate value, appraising as applied economics analysis, the appraisal framework, area analysis, neighborhood analysis, site analysis, site valuation, improvements analysis, direct sales comparison approach, gross rent multiplier analysis. Cost approach: reproduction cost of new improvements and estimation of accrued depreciation (diminished utility). Summary of the cost approach: correlation analysis and final value estimate, writing the appraisal report, professional ethics and standards practice. This course is modelled for students seeking credit in recognised programs of professional appraising societies.

20.454 Real Estate Finance — The purpose of this course is to enable the student to demonstrate a knowledge of the macroeconomic aspects of Canada's mortgage market; structure and analyse both residential and commercial mortgage loan applications and be familiar with loan management; analyse preferred refinancing vehicles from the perspectives of borrower and lender; be familiar with contemporary repayment arrangements, development financing, participation loans, leasehold financing and appraisal for mortgage lending.

20.462 International Marketing Management — Researching foreign markets and identifying opportunities, need for product modification; impact of culture and religion; pricing for profit, competition; distribution structure and types of foreign middlemen; trading companies; promotional techniques; brand protection; strategies used by various firms; the sales contract; the importance of personal selling.

20.463 Financing International Trade — This course covers the various financing methods in both import and export situations. Documentation requirements are thoroughly covered. Students become familiar with the operations of foreign exchange markets and methods of financing foreign investments.

20.477 Advertising Internship — An assigned work experience position with a lower mainland area advertising, promotion, broadcasting, print, or graphic services operation. On-the-job performance is fully evaluated.

20.478 Promotional Marketing — A study of all promotional support activities such as trade shows, publicity, special events, direct response marketing, and promotional specialties. Emphasis is on when and how to use them.

20.482 See 20.382

20.490 Directed Studies — Seven hours of the student's timetable are allocated to two major projects. The projects are to be in marketing areas of the student's choice and carried out under the guidance of assigned faculty members.

22.120 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 as applied to the marketing area of business.

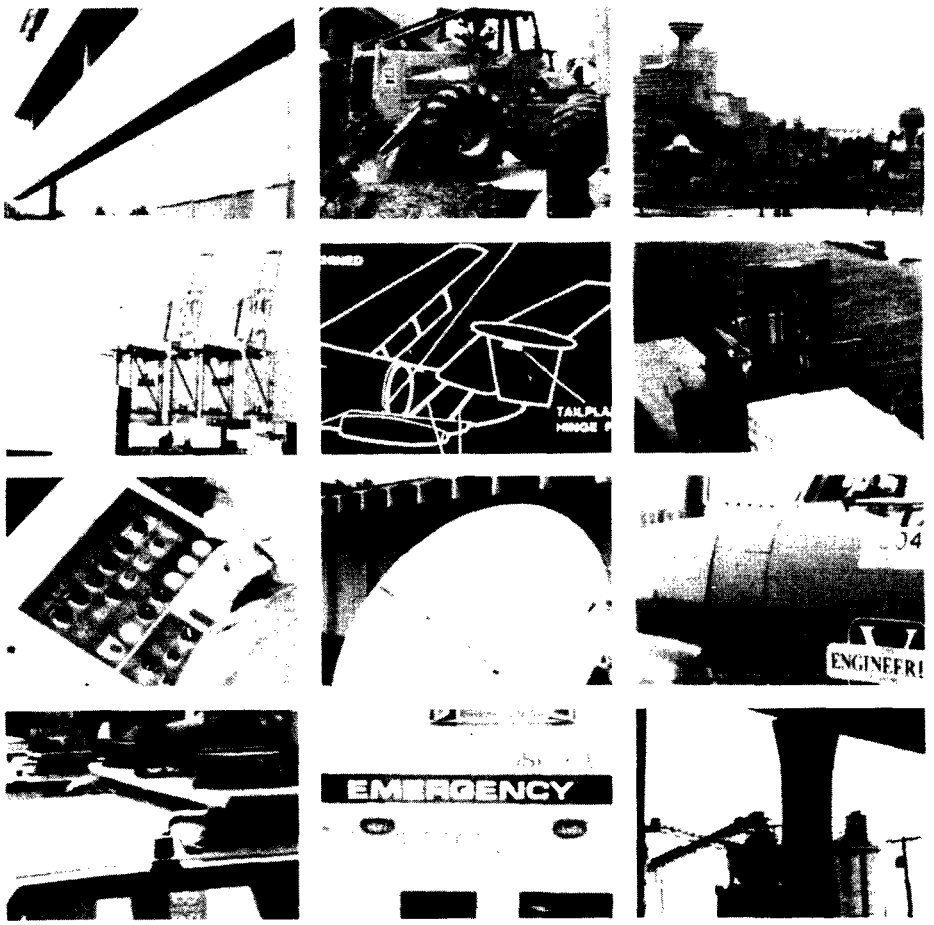
22.220 Business Statistics — Major emphasis on descriptive statistics, including numerical and graphical presentation of data, measures of central tendency and dispersion, elementary probability, index numbers and time series. Introduction to inferential statistics through selected topics such as sampling, confidence limits of the mean, hypothesis testing and simple linear regression.

31.120, 31.220 Business Communication — The course will develop the student's skill in the fundamentals of written business communication. The first semester introduces the student to basic research tools and to short and long reports. The second semester deals mainly with the various types of business letters. Students are also exposed to audiovisual presentation techniques and reading and study skills.

31.220 See 31.120

Faculty and Staff

R.W. Vandermark, B.A.,
Department Head
G.H. Abbott, B.Comm., M.B.A.
P. Cherry, B.Comm., Chief Instructor
D.K.N. Chowdhury, B.Sc., M.B.A., Ph.D.
D.F. Clark, B. Comm., M.B.A.
J.O. Hicks, R.I. (B.C.), F.R.I.
G.T. Jacob, B.A. (Hist. & Econ.), B.A. (Bus. Admin.), M.B.A., Program Head, International Business
C.G. Nelson, B.A.
G.S. Rees, M.B.A.
J.L. Salton, B. Comm., M.B.A.
M.I. Shacker, B.A., Program Head, Marketing Management
D.D. Ulinder, B.Sc. (U.L.E.) Program Head, Real Estate Management
R.A. Venne, B. Comm., (Hons. Econ.), M.B.A.
W.A.E. Walley, B.A.
T. Winder, B.A., M.B.A., Program Head, Advertising and Sales.



Operations Management

In today's changing world managers must be flexible and well equipped with the skills necessary to appreciate and understand rapidly developing technologies. Operations Management, with two program options, has been designed with this in mind.

With the emphasis on management, problem solving, computer applications, planning communications, decision-making and interpersonal skills, graduates from the **Operations Management Option** will be prepared with the tools necessary to manage and solve problems in a complex environment.

The **Transportation/Distribution Management Option** emphasizes systematic analysis for cost reduction or control within an organization, while increasing its customer service and strengthening its market position through a more effective distribution system.

Students in the Transportation and Distribution Management Option study both the "buying" (distribution and management) of a service, and the "selling" (supply of transportation facilities) for the movement of goods and people.

Job Opportunities

Operations Management graduates can choose from a variety of dynamic, highly paid management careers in such areas as:

operations management
production inventory control management
cost accounting management
systems management
project management
methods improvement management
distribution management
health care facilities management
management consulting
materials management
transportation management
purchasing management
quality control management
industrial engineering management
carrier terminal management
fleet management

Graduates find career opportunities in a variety of industries and institutions including:

manufacturing
mining
forestry
construction
warehousing and distribution
food
health care
airlines
railroad
shipping
government

Prerequisites

Graduation from the Selected or Combined Studies Program with Algebra 11 or Math 11. This requirement may be waived for mature students on approval of the Department Head. If your mathematical skills are in doubt, it is recommended that you take the Mathematics for Business Course (22.900). It is also recommended that potential students acquire basic typing skills due to the extensive use of computer input terminals in the program. Individuals applying to the Operations Management program should ask themselves the following questions:

do I want to be a manager?
do I enjoy a challenge?
do I like working with people?
do I want to work with computers?
do I welcome the opportunity to improve performance by changing present systems?
do I want to develop systematic problem-solving ability?

If yes — then apply and start charting your future.

Course of Studies

OPERATIONS MANAGEMENT OPTION

Year 1	Term 1	Clrm hrs/wk
14.050	*Introduction to Data Processing*	4
16.142	Introduction to Financial Accounting	3
22.100	Applied Mathematics	5
22.101	Introduction to Operations Management	7
31.122	Technical Communication	3
33.117	Basic Science	3
49.102	Interpretation of Engineering Drawings	2
49.109	Engineering Concepts I	3
	Library and Research	5
		35

Year 1	Term 2	
10.010	Economics	2
10.021	Organizational Behavior Fundamentals	2
16.242	Introduction to Managerial Accounting	3
22.200	Applied Statistics	4
22.201	Method Study	4
22.203	Systems	3
22.205	Computer Programming — Applied Basic	3
31.222	Technical Communication	3
33.217	Basic Science	3
49.209	Engineering Concepts II	3
	Library and Research	5
		35

Year 2	Term 3	Clrm hrs/wk
10.318	Economics	3
10.368	Personnel Administration	2
16.348	Cost Accounting	3
22.300	Quantitative Methods	5
22.304	Production Control Management I	5
22.305	Computers and Information Processing	3
22.306	Industrial Engineering	5
22.307	Performance Measurement	4
	Library and Research	5
		35

Year 2	Term 4	4A	4B
10.438	Industrial Relations	—	4
20.115	Market Research	2	2
22.400	Quantitative Methods	7	3
22.401	Industrial Engineering Concepts	—	17
22.404	Production Control Management II	5	2
22.405	Computers and Information Processing	3	—
22.406	Industrial Engineering	10	—
22.408	Supervision	2	2
22.409	Quality Assurance	2	—
	Library and Research	4	5
		35	35

TRANSPORTATION/DISTRIBUTION MANAGEMENT OPTION

Year 1	Term 1
10.010	Economics
10.080	Law
14.050	Introduction to Data Processing
16.140	Accounting
20.180	Marketing
22.165	Economic Geography
22.167	Applied Mathematics
31.122	Corporate and International Communication

Year 1	Term 2
10.011	Economics
10.081	Law
16.240	Accounting
20.280	Marketing
22.101	Introduction to Operations Management
22.175	Transportation Methods
22.205	Applied BASIC
22.267	Applied Mathematics
22.364	Integrated Purchasing
31.222	Corporate and International Communication

Year 2	Term 3
10.380	International Law
22.305	Computers and Information Processing
22.363	International Trade
22.366	Transportation Marketing Strategies
22.367	Quantitative Methods
22.370	Management Engineering
22.372	Transport Service and Costing
22.374	Transportation Regulation

Year 2	Term 4
10.030	Industrial Relations
10.047	Personnel Fundamentals
16.443	Managerial Accounting
22.405	Computers and Information Processing
22.408	Supervision
22.409	Quality Assurance
22.464	Logistics
22.467	Quantitative Methods
22.474	Traffic Management
22.475	Transportation Management
22.476	Principles of Import/Export
22.484	Manufacturing Methods
22.491	Industrial Project

Subject Outlines

10.010, 10.011 Economics — The aim of the course is to develop an understanding of the organization and operation of the Canadian economy. Students analyze demand and supply, how production costs vary, and how prices are determined in different markets (micro-economics). The theoretical tools of the economist are used to explore the concepts of national income, employment, inflation, and growth (macro-economics). An appreciation of the relation between economic theory and economic policy is provided.

10.011 See 10.010

10.021 Organizational Behavior Fundamentals — This course is the study of man's behavior and attitudes in an organizational setting; the organization's effect on his perceptions, feelings and actions; and his effect on the organization, particularly how his behavior affects the achievement of the organization's purposes. Such concepts as leadership, communications, power, authority, change and conflict will be examined.

10.030 Industrial Relations — An introductory analysis of the fundamental issues and facts of labor-management relations. Special emphasis is given to collective agreement content and interpretation, bargaining and basic labor economics.

10.047 Personnel Fundamentals — An introduction to the fundamentals of personnel management, including human resource planning; recruiting and section techniques; job analysis, descriptions, and evaluation; compensation administration; performance appraisal systems; training; and employee safety and health. Includes a review of current British Columbia employment legislation.

10.080, 10.081 Law — A study of legal rules under principles which guide decisions involving the law of contracts. Included are the sale of goods and negotiable instruments and the business associations of agency, partnership and the company.

10.081 See 10.080

10.380 International Law — A study of the principles which guide decisions involving the law of contracts, including the international sale of goods and negotiable instruments.

14.050 Introduction to Data Processing — Training in basic data processing principles to develop recognition of the possible application of these principles in industry. The principal functions of data processing are illustrated and practised with an H.P. minicomputer operating interactively. Elementary computer programs are written and tested on the computer. Use of flow-charting and elementary data processing systems design will illustrate the achieving of data processing objectives.

16.140, 16.240 Accounting — Basic accounting procedures; closing the books; adjustments; working papers; merchandise operations; statement and ledger organization; special journals; forms of business organization; accounting principles; introduction to cost accounting; analysis of financial data; working capital; departmental and branch operations; consolidations.

16.142 Introduction to Financial Accounting — An introduction to financial accounting that includes a survey of the accounting process and a review of basic accounting theory. Preparation of financial statements, analysis of financial statements and the reporting of financial information to outsiders is covered in depth. Also covered is the accounting for assets, liabilities and owner's equity.

16.240 See 16.140

16.242 Introduction to Managerial Accounting — This course covers the preparation and utilization of financial information for internal management purposes. Volume-profit analysis, capital budgeting, depreciation, return on investment, budgeting systems, common dollar accounting and funds flow analysis will also be considered.

16.348 Cost Accounting — This course will concentrate specifically on cost accounting for operations management. Topics will include basic cost concepts, systems of cost accumulation, accounting for manufacturing overhead, standard cost systems and the analysis of cost variances. Variable costing is also dealt with.

16.443 Managerial Accounting See 16.140

20.115 Market Research — Familiarization with the basic approaches to market research. Lectures and workshop sessions will emphasize data gathering techniques, the analysis and intepretation of data related to the decision-making process.

20.180, 20.280 Marketing — An introduction to the marketing concept, environment, and institutions with detailed study of the basic marketing functions including marketing research, product planning, selection of trade channels, merchandising, advertising, and sales promotion. This course embraces marketing of consumer and industrial goods.

20.280 See 20.180

22.100, 22.200 Applied Mathematics — The fundamentals of descriptive statistics

and a comprehensive study of the use of statistical inference are integrated with applied mathematics and are covered concurrently over a one-year period. Basic algebra, trigonometry and graphs with business applications are reviewed. Topics include basic mathematics of finance, simple and compound interest, loan-payment plans, methods of evaluating investments, probability theory and distributions, sampling, hypothesis testing, chi-square, rank correlation, linear regression and index numbers.

22.101 Introduction to Operations Management — A study of the business firm with respect to its organization and functions. Emphasis is placed on how the operations management graduate will fit into the organization. This is accomplished through discussions, field trips to local industries and related case problems. Additional areas of interest will include business law and government regulations involving the working environment.

22.165 Economic Geography — Transportation is the basis of all economic systems including agricultural production, industrial location, settlements patterns, marketing systems, and consumer shopping. This course studies in detail the role of transportation, major trading routes and ports, and other factors in the development of resources for the world and Canada. Emphasis is placed on Canada as a major resource producer, particularly in the emerging Pacific Rim.

22.167, 22.267 Applied Mathematics — The quantitative approaches to decision making are examined in this course with application of financial analysis techniques, integrated with statistics and mathematical modeling. Topics include: breakeven analysis, simple and compound interest, methods of evaluating investments, probability theory and distributions, sampling, linear regression, rank correlation, and linear programming queuing theory.

22.175 Transportation Methods — This course introduces students to the various ways of moving commodities, including air, highway, pipeline, rail and water carriers. Economic costs of operating and selection of equipment are also covered.

22.200 See 22.100

22.201 Method Study — The student studies the principles of systematic scientific problem-solving in business and industry. Selection of study areas, economic feasibility, recording techniques, assembly and analysis of data, critical examination and the development of alternative solutions for design and production problems. The emphasis is on productivity improvement.

22.203 Systems — The course includes problem definition, systems of data collection, information analysis, problem analysis and solution through the use of quantitative techniques. Other areas include office procedure analysis and facility layout.

22.205 Computer Programming - Applied BASIC — Instruction in the use of advanced BASIC to solve problems common to the Operations Management discipline. Topics include arithmetic operations, input/output, loops, subroutines, files, arrays, strings, and functions. Introduction to Data Processing 14.050 is a prerequisite.

22.267 See 22.167

22.300, 22.400 Quantitative Methods for Management I and II — Applications of the scientific method and mathematical modelling to decision-making in business and industry. Topics include break-even analysis, additional probability and decision theory, inventory control, vectors, matrices, linear programming, simulation models and queuing theory.

22.304, 22.404 Production Control Management I and II — Introduction to the basic concepts of production control with a special emphasis on the design of control systems for operating environments. Practical experience in controlling a production system will be given through the operation of a simulated production shop. Topics include scheduling, planning, organization of production departments, dispatching and progress control, maintenance and quality control.

22.305, 22.405 Computers and Information Processing — Introduction to computer systems design and the application of the computer in the Operations Management field. Topics include computer hardware, computer software, computer systems flow-charts, selected application packages, file organization techniques and computer resources in the community. At the conclusion of this course, students will have gained a broad appreciation of the application, both current and potential, of the computer in the business world.

22.306, 22.406 Industrial Engineering — This course covers materials handling, facility layout and design and cost analysis. There will be an opportunity to apply these to a group of relevant case and real life problems.

22.307 Performance Measurement — This course gives the student an appreciation for physical work performed by both industrial and office workers. The student will learn two forms of work measurement, predetermined motion time systems and time study. He will also learn performance ratings and how to establish standard times.

22.363 International Trade — To develop an understanding of international logistics including economic and financial profitability and comparative advantage or disadvantage when related to FOB, C&F or CIF pricing; computerized shipping, inventory manoeuvring, and payment; international transportation, conference and non-conference lines on Pacific and Atlantic, and Sea-Air services relating to inventory management, goods in transit, and free ports.

22.364 Integrated Purchasing — Acquaints the student with purchasing principles and methods using computerized techniques. Methods of buying transportation services are covered. Emphasis is placed on computer assisted analysis of PARETO's law including vendor evaluation and contracting methods for A, B, C items categories. Course also includes advanced application of the EOQ formulae taking turnover into consideration on three levels: vendor-firm-customer, geographic freight consolidation, and cost saving results. Elements of material management; customer services; performance standards; computerized measures emphasized goods-in-transit manipulation to avoid stockouts; and the basic components of cost trade-offs through special quantitative case studies are also covered.

22.366 Transportation Marketing Strategies — The student learns to relate the services of a transportation company to the requirements of the client. The increasing impact of intermodalism, private fleet, shippers coops are covered while the student develops the ability to analyse the competitive position of his carrier (employer), to assure effective participation in the market.

22.367, 22.467 Quantitative Methods — Following basic training in mathematics of finance and statistics, students are introduced to the solution of more complex business problems by mathematical processes. Forecasting methods are examined with computerized analysis of data. Some aspects of management science that are particularly useful in the transportation business are examined manually and through the computer. These include linear programming; the transportation model; and simulation, particularly aimed at waiting line analysis. Considerable effort is in interpretation of results and preparation of management oriented reports.

22.370 Management Engineering — Topics include method study; charting and analysis; warehousing methods areas of location selection, layout, planning, scheduling; and work measurement, costing, and productivity indexes.

22.372 Transport Service and Costing — Covers a variety of transportation services and their cost factors including carrying capacity, load factors, fuel cost, etc., concluding with profit oriented rate making. Costing methods relating to various modes of transportation are discussed considering distance, flow of goods, and backhaul.

22.374 Transportation Regulations — Familiarizes the student with transportation regulations at federal, provincial, and

regional levels. The Acts govern intra and inter province transportation, and regulate common, contract and private carriers including their rights and responsibilities. Emphasis is on the deregulated U.S. transportation industry.

22.464 Logistics — This course is an overview of the Total Distribution Concept. Adding to previously learned information this course examines distribution facility location analysis, information systems, control systems and distribution economics.

22.400 See 22.300

22.401 Industrial Engineering Concepts — A comprehensive external study in a local firm requiring the application of material from various recordings and analysis of data from the field, terminating in a written report and an oral presentation of the project.

22.404 See 22.304

22.405 See 22.305

22.406 See 22.306

22.408 Supervision — This course introduces the student to some of the skills required to implement short-range managerial decisions with the resources available at the first level of supervision.

22.409 Quality Assurance — Modern concepts of Quality Management for the manufacturing and service industries. Management levels and topics include: inspection, quality control and quality assurance; organization; systems functions and documentation requirements; technical, economic and legal aspects of quality assurance management; supplier quality assurance; product reliability; Canadian national standards for quality programs.

22.467 See 22.367

22.474 Traffic Management —To acquaint the student with the broad responsibilities of a traffic manager in an industry requiring transportation services. Includes negotiating with common carriers, criteria of carrier selection, rate negotiations, routing, consolidation, documentation, handling claims, tracing, expediting, and carrier performance analysis for future carrier selection.

22.475 Transportation Management — The operation departments of a transportation company are described in detail including freight tariffs as applicable to commodity, special and ancillary services, routing, misrouting, claim prevention, and the organization and control of the company. An in-depth knowledge of the trade from the carrier's viewpoint is required.

22.476 Principles of Import/Export — Practical application of previously learned theories acquaints the student with the terminology and interpretation of the Customs Act, customs tariff, excise tax, and Antidumping Act. Gives the student thorough understanding of fair market value, dumping, countervailing duty, the GATT, tariffs, and the increasing use of non-tariff barriers including present new devices. Documentation for importing and exporting, entries, drawbacks, refunds, appeals, and classification is covered.

22.484 Manufacturing Methods — A study of the processes involved in the making of consumables. Physical, chemical and electrical principles are reviewed with special emphasis on the handling, care and disposal of hazardous products.

22.491 Industrial Project — Each student will conduct an in-depth, supervised study/research project in an external, local firm. This study will terminate with the submission of a formal technical report and an oral presentation to the management of the sponsoring firm.

31.122, 31.222 Technical Communication — The course is divided into a one-hour lecture and a two-hour lab per week. In the lecture, students receive information on basic writing and communicating skills, reading and study skills, business correspondence and related writing tasks, audiovisual techniques, oral presentations and reports. The lab hours are used to practise these skills. There will be approximately 10 assignments each term; each assignment is designed to develop a specific communication skill that the student will need in his or her field.

31.222 See 31.122

33.117, 33.217 Basic Science — This is a survey course covering the usual topics of physics as they relate to the Operations Management Technology. The use of precise mathematical relationships is minimal. Emphasis is on how the basic laws of physical science affect and limit activities in the technology.

33.217 See 33.117

49.102 Interpretation of Engineering Drawings — This course introduces the student to engineering drawings as a method of communication. He/she will learn how to read various types of blueprints and how to communicate through the use of drawings. Emphasis is placed on visualization, dimensioning and freehand sketching.

49.109 Engineering Concepts I — A study of applied mechanics and design concepts. Topics include some metallurgy, forces, moments, couples, frames, beams, centroids, friction and some elementary dynamics.

49.209 Engineering Concepts II — A study of manufacturing processes and equipment including casting, forging, presswork, welding. Student participation includes visits to local industry, practical lab work and preparing and presenting to the class topics on processes of recent development.

Faculty and Staff

B.R.M. Morrow, B.Comm., *Department Head*
C. Chan, M.B.A.
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S.E. Dudra, B.Comm., M.B.A., C.P.I.M., Program Head
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P.R. Harrison, M.B.A., P.Eng., M.I. Mech.E.
K.C. Hartley, B.A.Sc., P.Eng., C.P.I.M.
C.A. Hayden, Dipl.T.
L.J. Hendry, B.Comm., C.A.
A.S. Lee, B.Eng., P.Eng., M.Ed.
J.E. Lloyd, M.Ed., P.Eng.
P. McSorley
D.W. Malcolm, B.Sc., C.E.T.
D.J. Mallory, B.A.Sc., M.A., Ph.D.
E. Mason, B.A.Sc., P.Eng.
J.A.I. Millette, B.A., M.Ed.
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W.J. Sheriff, B.A., B.Sc.
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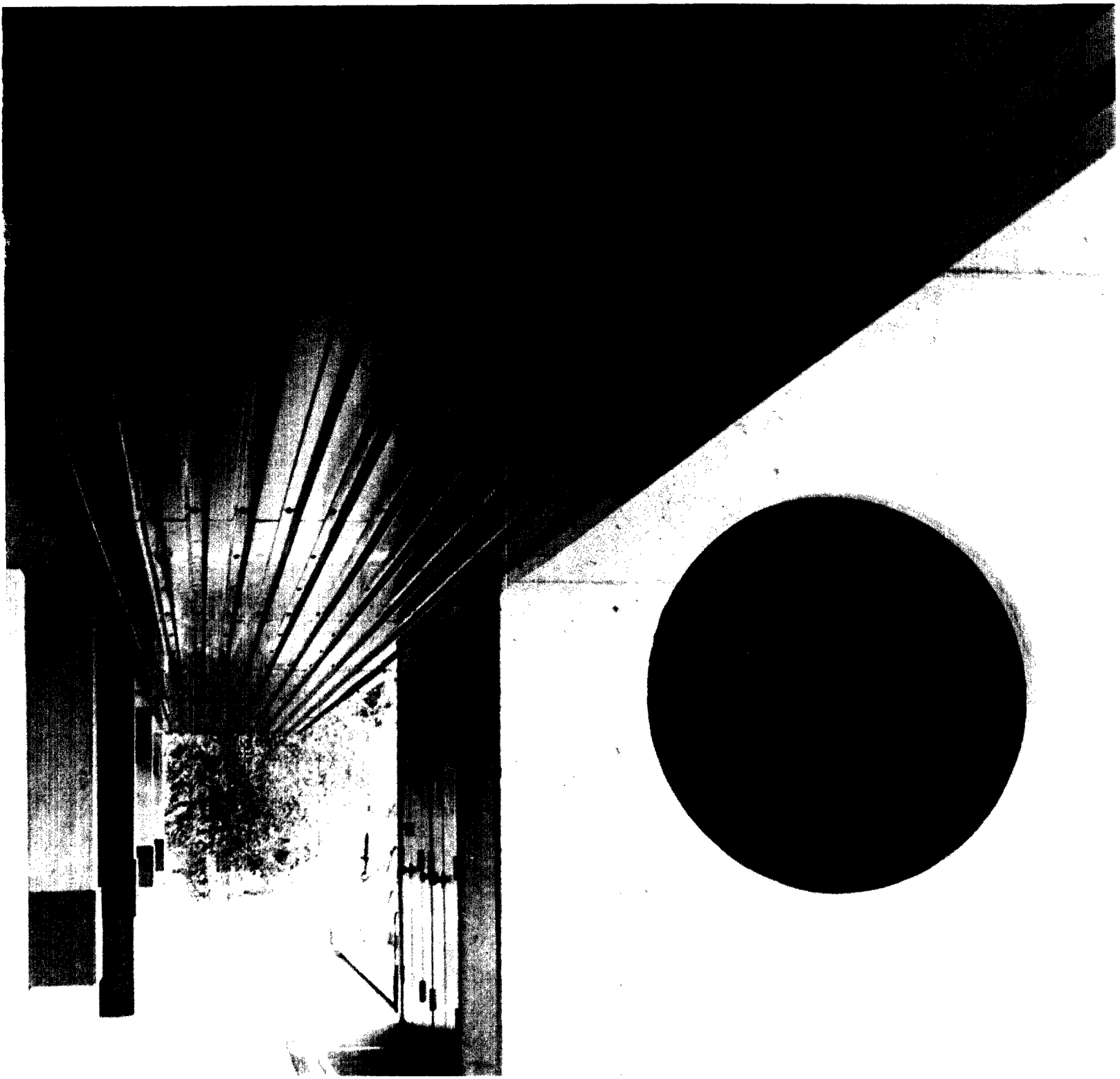
C.V. Spong, Dipl.T.
J. Young, B.Sc., M.B.A., P.Eng.

Engineering



Biological Sciences

The Biological Sciences Technology, with its choice of programs and options, offers a variety of secure and worthwhile career possibilities, encompassing indoor and outdoor work in large or small-scale settings. Food processing and production offers stable employment, even during unsettled economic conditions, since these industries are tied to population growth. Those with a concern for their environmental surroundings may gravitate towards landscape horticulture. Others may be interested in mastering the complexities of farm management.

Job Opportunities

Graduates in the **Food Processing Option** of the Biological Sciences Program find employment in the food manufacturing industry, where they may perform chemical, physical and bacteriological tests on food materials during processing and on packaged goods, or they may supervise manufacturing processes within the plant. Other opportunities are found in government laboratories and inspection services.

Food Production Option graduates may occupy positions concerned with lab control of the production of agricultural chemicals, feeds and fertilizers, or in the field operations of food manufacturing. Inspection services and government and industry research labs also provide employment opportunities.

Landscape Horticulture Option graduates are employed with landscape contractors, horticultural nurseries, parks and recreation systems, landscape architects and planners.

Agri-Management Program graduates have broad employment opportunities. Some return to the family farm with a greatly broadened understanding of management principles and operating practices. Others are employed on large, multi-unit farms as management trainees. Still others find ready employment in farm-related business firms.

The Programs

The Biological Sciences Technology offers two programs: the Biological Sciences Program and the Management in Agriculture (Agri-Management) Program.

The first term of the Biological Sciences Program provides students with a general background before they proceed to one of three options: Food Processing, Food Production or Landscape Horticulture.

The Biological Sciences Program is accredited by the Society of Engineering Technologists.

Prerequisites

Graduation from the Selected or Combined Studies Program is necessary for entrance to either program. Algebra 12 or Math 12 and Chemistry 11 are prerequisites for the Biological Sciences Program (Food Processing, Food Production, Landscape Horticulture), while Agri-Management Program students need Algebra 11 or Math 11 only.

Math 11 and 12 are only acceptable if taken prior to 1978

Course of Studies

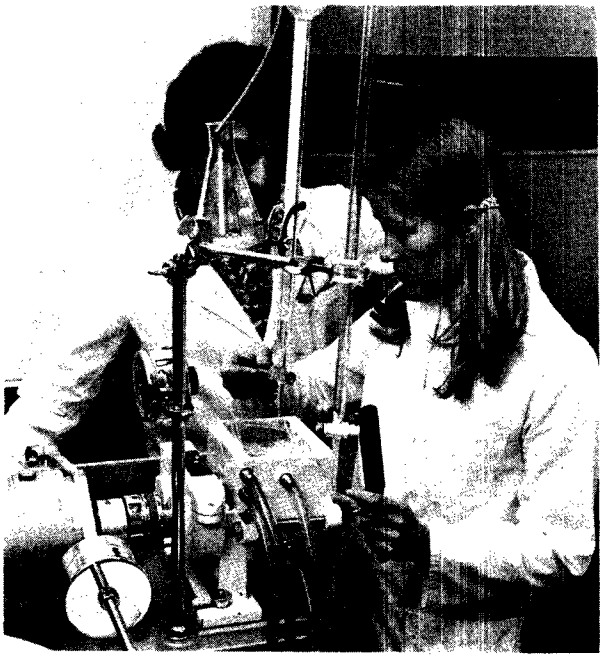
Biological Sciences Program

Year 1	Term 1	Clrm hrs/wk
30.103	Applied Chemical Principles	6
31.144	Technical Communication	3
32.144	Basic Technical Mathematics	5
33.102	Physics for Biological Sciences	5
44.121	Introductory Microbiology	6
44.122	Biology	5
	Library and Research	5
		35

Food Processing Option

Year 1	Term 2	2A	2B
30.203	Applied Chemical Principles	6	6
31.244	Technical Communication	3	3
32.244	Probability and Statistics	5	5
33.202	Physics for Biological Sciences	5	5
44.201	Food Processing	6	6
44.221	Microbiology for Food Processing	5	5
	Library and Research	5	5
		35	35

Year 2	Term 3	
22.344	Basic Operations Management	3
30.303	Instrumental Analytical Methods	5
31.344	Advanced Technical Communication	2
44.301	Food Processing	5
44.303	Nutrition for Food Processing	2
44.311	Quality Control	4
44.312	Introductory Food Analysis	5
44.341	Mechanics of Machines	4
	Library and Research	5
		35



Food Processing students acquire a thorough knowledge of food preservation techniques such as canning, freezing, dehydrating and fermenting, as well as receiving a solid grounding in food chemistry and food microbiology.

Food Production students concentrate on the scientific aspects of the production of food from agricultural sources. Their curriculum includes courses in the plant, animal and soil sciences and, in addition, subjects which stress the analytical and mechanical principles of food production.

The **Management in Agriculture** Program (Agri-Management) curriculum is devoted to both the agricultural and business aspects of the farming industry. Courses include plant, animal and soil sciences and agricultural mechanics, as well as marketing, business organization and management, business law and taxes, finance and appraisal, as they relate to agriculture. The Agri-Management Program includes a summer practicum of supervised on-farm experience between first and second year.

Students in **Landscape Horticulture** study the natural sciences related to floriculture, arboriculture, nursery production, turf management and landscaping. Landscape plan production techniques are also studied.

Year 2	Term 4	4A	4B
10.005	Management Fundamentals	4	—
32.444	Computing	4	—
43.456	Instrumentation	—	6
44.401	Food Processing	5	5
44.402	Process Analysis	5	5
44.411	Quality Control	4	—
44.412	Food Analysis	5	5
44.415	Enzymatic Analysis	—	4
44.431	Sanitation	4	4
	Library and Research	5	5
		36	34

Food Production Option

Year 1	Term 2	2A	2B
30.203	Applied Chemical Principles	6	6
31.244	Technical Communication	3	3
32.244	Probability and Statistics	5	5
33.202	Physics for Biological Sciences	5	5
44.223	Microbiology for Food Production	5	5
44.251	Food Production	6	6
	Library and Research	5	5
		35	35

Year 2	Term 3	
30.303	Instrumental Analytical Methods	5
31.344	Advanced Technical Communication	2
44.312	Introductory Food Analysis	5
44.341	Mechanics of Machines	4
44.352	Applied Genetics	4
44.361	Plant Technology	6
44.371	Animal Technology	4
	Library and Research	5
		35

Year 2	Term 4	4A	4B
20.105	Agricultural Business	6	—
32.444	Computing	—	4
44.413	Agricultural Analysis	5	5
44.414	Experimental Techniques	4	4
44.442	Agricultural Mechanics	5	5
44.462	Plant Protection	6	6
44.481	Soil Technology	5	5
	Library and Research	5	5
		36	34

Landscape Horticulture Option

Year 1	Term 2	2A	2B
10.005	Management Fundamentals	—	4
30.217	Applied Chemical Principles	6	—
31.244	Technical Communication	3	3
33.202	Physics for Biological Sciences	5	5
40.244	Landscape Drafting	3	3
44.253	Introductory Botany and Soils	6	6
44.263	Horticulture I	4	5

Year 1	Term 2 cont.	2A	2B
51.205	Introduction to Surveying	3	3
	Library and Research	5	5
		35	34

Year 2	Term 3	Clrm hrs/wk
31.344	Advanced Technical Communication	2
40.344	Landscape Drafting	3
44.343	Landscape Mechanics	5
44.363	Horticulture II	6
44.364	Nursery Crop Production	6
44.366	Landscape Techniques	5
44.367	Advanced Plant Identification	3
	Library and Research	5
		35

Year 2	Term 4	4A	4B
42.444	Land Engineering	3	3
44.462	Plant Protection	6	6
44.465	Landscape Field Practices	6	6
44.466	Landscape Techniques	6	6
44.468	Supervisory Practices	4	—
44.481	Soil Technology	5	5
45.412	Silviculture and Forest Nurseries	—	4
	Library and Research	5	5
		35	35

Management in Agriculture (Agri-Management) Program

Year 1	Term 1	
10.005	Management Fundamentals	3
10.010	Economics	3
16.140	Accounting	5
22.110	Business Mathematics	4
31.144	Technical Communication	3
33.102	Physics for Biological Sciences	5
44.122	Biology	5
44.150	Agricultural Concepts	2
	Library and Research	5
		35

Year 1	Term 2	2A	2B
10.011	Economics	3	3
16.240	Accounting	5	5
22.210	Business Statistics	4	4
31.244	Technical Communication	3	3
33.202	Physics for Biological Sciences	5	5
44.251	Food Production	6	6
44.290	Agricultural Marketing	3	3
	Tutorial on Agricultural Concepts	1	1
	Library and Research	5	5
		35	35

A technical report on a summer practicum of on-farm experience will be required for students continuing into second year.

Year 2	Term 3	
44.341	Mechanics of Machines	4
44.352	Applied Genetics	4
44.361	Plant Technology	6
44.371	Animal Technology	4
44.391	Agricultural Business Organization and Management	5
44.392	Agricultural Business Law and Taxes	3
44.393	Agricultural Business Finance and Appraisal	3
44.394	Summer Technical Report	1
	Library and Research	5
		35

Year 2	Term 4	4A	4B
10.045	Human Resource Management	3	3
22.444	Basic Operations Management	2	2
44.442	Agricultural Mechanics	5	5
44.462	Plant Protection	6	6
44.481	Soil Technology	5	5
44.491	Agricultural Business Organization and Management	5	5
44.495	Crop and Livestock Management	4	4
	Library and Research	5	5
		35	35

Subject Outlines

10.005 Management Fundamentals — An orientation to the nature of business management and the administrative process. Elements of planning, organization and leadership techniques are examined. Study and discussion of actual business cases, illustrating problems frequently met in industry and requiring managerial analysis, decision and action will be undertaken.

10.010, 10.011 Economics — The aim is to develop an understanding of the organization and operation of the Canadian economy. Students analyze demand and supply, how production costs vary, and how prices are determined in different markets (micro-economics). The theoretical tools of the economist are used to explore the concepts of national income, employment, inflation and growth (macro-economics). An appreciation of the relationship between economic theory and economic policy is provided.

10.011 See 10.010

10.045 Human Resource Management — An introduction to the major personnel and industrial relations programs applicable to the British Columbia workplace with emphasis on the value of the worker and the overall effectiveness of modern human resource management. It develops understanding of the skills required for selection interviews, performance appraisals, compensation reviews, labour contract negotiations, training and development programs, grievance and collective agreement administration and it reviews relevant employment law.

16.140, 16.240 Accounting — Basic accounting procedures; closing the books; adjustments; working papers; merchandise operations; statement and ledger organization; special journals; forms of business organization; accounting principles; introduction to cost accounting; analysis of financial data; working capital; departmental and branch operations; consolidations.

16.240 See 16.140

20.105 Agricultural Business — The objective of this course is to introduce the application of business skills to agribusiness and to study, in particular, the marketing functions as related to the marketing of agricultural products and services. Case studies and readings are used to illustrate the practical problems of agri-business.

22.110 Business Mathematics — A 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 as applied to business administration.

22.210 Business Statistics — Major emphasis is placed on descriptive statistics, including numerical and graphical presentation of data, measures of central tendency and dispersion, elementary probability, index numbers and time series. Introduction to inferential statistics through selected topics as sampling, confidence limits of the mean, hypotheses testing and simple linear regression.

22.344, 22.444 Basic Operations Management — The techniques of management problem-solving and work simplification, with particular application to engineering and industrial organizations. Includes method study, some measurement techniques, layout, planning and scheduling. The course emphasizes practical applications in the field of biological sciences.

22.444 See 22.344

30.103 Applied Chemical Principles — An applied course of basic inorganic chemistry, including simple stoichiometry, solubility product, selective precipitation, solution preparation, pH, buffer solutions, oxidation-reduction, acid-base theory and titration calculations. Lab work consists of simple qualitative and analysis. Good lab techniques are emphasized.

30.203 Applied Chemical Principles — A continuation of 30.103 that includes theory of gravimetric and volumetric analysis, titration curves, chemical kinetics, simple physical chemistry, atomic structure, ionic and covalent bonding, periodicity and descriptive organic chemistry of selected groups. Lab work consists of qualitative and quantitative analysis and physical separations.

30.217 Applied Chemical Principles — A continuation of 30.103 with emphasis on application to landscape horticulture. Topics discussed include soil chemical structures, ion-exchange, pH, solubility and redox effects, soil amenders, fertilizers and pesticides. Basic organic chemistry is introduced.

30.303 Instrumental Analytical Methods — This course introduces basic theoretical concepts, instrument construction and operation and general application of the following methods: potentiometry, polarography, refractometry, polarimetry, visible, ultra-violet and infra-red, and includes absorption and emission flame photometry and gas chromatography.

31.144, 31.244 Technical Communication — The objective of this course is to increase students' skills in both written and oral communication. Students will have one lecture in which specific writing or speaking skills are discussed and one two-hour lab period during which they will apply the skills learned in the lecture. Students will write informal and formal reports, letters, resumés and memos, and will give at least one oral presentation each term.

31.244 See 31.144

31.344 Advanced Technical Communication — In two hours of lab sessions each week, students practice, under supervision, typical kinds of engineering communications such as letters, memos, reports, proposals and meetings. Some assignments are carried out jointly with various biological sciences courses. The equivalent of one short writing assignment per week is required.

32.144 Basic Technical Mathematics — Theory and application of exponentials: common and natural logarithms, log-log and semi-log graphing, exponential and logarithmic equations. **Calculus for algebraic functions**: the derivative, derivatives of polynomials, products, quotients, and power of a function, curve sketching, applied maximum and minimum, differentials, the indefinite integral, the definite integral, areas under a curve and other applications.

32.244 Probability and Statistics — Descriptive statistics: organizing data into a frequency table, geometric and arithmetic descriptions. **Probability**: events, sample space, addition and multiplication laws, independent events and trials, counting formulas. Random variables; mathematical expectation; binomial, Poisson and normal distributions; sampling distributions; estimation of the mean—large and small sample methods; type I and type II errors; correlation and linear repression with estimation and hypothesis testing of parameters.

32.444 Computing — An introduction to computing, using the BASIC language: flow charting; input-output statements, branching, looping, sub-scripted variables, subroutines; applications from the Biological Sciences Technology.

33.102, 33.202 Physics for Biological Sciences — This is an introductory level course covering a wide range of physical principles, with emphasis on areas of popular interest and of special relevance to the Biological Sciences Technology. Topics covered in first term include kinematics, dynamics, friction, statics, energy, power, circular motion, momentum, elasticity and fluid mechanics. Topics covered in second term include temperature, heat, calorimetry, kinetic theory, heat transfer, basic electricity and magnetism, colorimetry, optics relativity and radiation. Measurements, data analysis, experimental techniques and report writing are stressed.

33.202 See 33.102

40.244 Landscape Drafting — Elements of landscape structural details relative to concrete slab on grade, foundations, curbs, driveways, walks, retaining walls, stairs and pools. Basic drafting, as applied to above.

40.344 Landscape Drafting — Continuation of 40.244. Elements of landscape structural details relative to post and beam, masonry and concrete roof decks. Drafting, as applied to above.

42.444 Land Engineering — An introduction to the behavior of earth and land surfaces and engineering materials under various natural conditions and under the action of both static and dynamic forces commonly occurring in engineered works. Included are foundation loads, settlements and bank stability of various soil types; and the occurrence and flow of water under and above ground. By means of a project, the student learns to assess runoff flows through hydrological methods, designs a retaining dam for a recreational site complete with inlet and outlet flood-control structures, and estimates quantities for construction purposes.

43.456 Instrumentation — An orientation course for the Food Processing Option covering the principles and practices of instrumentation; measurement of pressure, level, temperature and flow; and an introduction to negative feedback and automatic control systems.

44.121 Introductory Microbiology — The course is designed to train students in the basic microbiological procedures employed in a laboratory; use and care of the microscope; staining methods; aseptic techniques; methods of indentifying micro-organisms.

44.122 Biology — A study of the principles underlying living phenomena, including the organizational attributes of living matter. Evolutionary development is traced from one-celled organisms to higher plants and animals. The economic importance of various classes of plants and animals is included.

44.150 Agricultural Concepts — An overview of agricultural production in British Columbia, including terminology types,

areas, size and trends. Business and management principles as applied to agriculture. A brief exposure to government and marketing board involvement in agriculture. Information on farm-related businesses which supply and support the agricultural producer.

44.201 Food Processing — The nature and packaging of foods; an introduction to the principles and processes of canning, freezing, dehydrating, fermenting and pickling; food additives. Experimental portions of food will be preserved by these methods during lab periods.

44.221 Microbiology for Food Processing — The application of microbiology to food manufacturing. The isolation of micro-organisms significant to food processing for the purposes of differentiation and classification. Maintaining high bacteriological standards in processed foods. Shelf-life studies. Spoilage control. Food fermentations. Assessing microbiological test results and report writing to management.

44.223 Microbiology for Food Production — The application of microbiology to agricultural food production. An introduction to plant and animal pathology and to immunology. Seminar project. Assessing and reporting microbiological test results.

44.251 Food Production — An introduction to food production, including basic plant science with reference to plant morphology and physiological processes; soil science with reference to soil classification and soil development; animal science with emphasis on general production and marketing.

44.253 Introductory Botany and Soils — An introduction to plant morphology and physiology, with particular reference to ornamental and horticultural plants; soil types and introduction to soil testing. Culture and management of ornamental and recreational turfgrass.

44.263, 44.363 Horticulture I and II — The principles of environmental control and plant response. Plant growth regulators. Genetic principles pertinent to ornamental horticulture. Basic greenhouse and plant propagation techniques. Principles of plant taxonomy and nomenclature. Recognition and use of woody species found in the landscape.

44.290 Agricultural Marketing — This course examines the marketing of agricultural products, from farm gate to final consumption. Includes the collection, transportation, storage, processing, distribution, financing and merchandising of food products, as well as government involvement, marketing boards, auctions, and marketing strategies of service and supply firms.

44.301, 44.401 Food Processing — Detailed studies of specific food manufacturing processes, including dairy products manufacture, fruit and vegetable processing, jams and jellies, fish and meat products, edible fats and oils, food emulsions, processed potato products, dehydrated and freeze-dried foods, tea and coffee, spices, confections and products of milling and baking.

44.303 Nutrition for Food Processing — A study of the nutrients found in food, their importance, metabolic function and dietary requirements. The selection of diets to meet varied nutritional needs. The relationship of nutrition and health. Nutritional labelling. The effect of processing on the nutritional quality of foods.

44.311 Quality Control — An assessment of food quality. Responsibilities and organization of a quality control department in the food industry. Statistical procedures for sampling. Federal and provincial government regulations. An introduction to tri-stimulus colorimetry, and the measurement of color in foods.

44.312 Introductory Food Analysis — An introduction to the theoretical and practical aspects of sampling and sample preparation. The proximate analysis of foods and livestock rations. An introduction to carbohydrate and protein chemistry with selected analyses, using the best equipment available.

44.341 Mechanics of Machines — Basic mechanical principles of food processing and agricultural equipment. Power transfer devices. Introduction to electrical power. Fluid mechanics as applied to pumping systems. Equipment lubrication and construction materials. Heat transfer. Psychrometrics.

44.343 Landscape Mechanics — A study of basic engineering principles of landscaping and nursery crop equipment. Landscape irrigation and drainage. Greenhouse systems.

44.352 Applied Genetics — Principles of genetics, including heredity and environment; Mendel's law of segregation, expression and interaction of genes and multiple factor inheritance; applied plant breeding and animal breeding.

44.361 Plant Technology — Plant environment and control. Plant processes and their manipulation in commercial crop plants. Application of various plant culture techniques in crop production, with reference to representative cereals, forages, vegetables, small fruits and tree fruits grown in British Columbia.

44.363 See 44.263

44.364 Nursery Crop Production — Field and container culture of nursery plants. Nursery stock specifications. Site selection and layout. Growing structures and equipment.

44.366, 44.466 Landscape Techniques — History and principles of landscape design. Inventory of client requirements. Site analysis. Preparation of working drawings, bidding and contract documents.

44.367 Advanced Plant Identification — A continuation of the plant identification studies begun in Horticulture I and Nursery Crop Production, with particular reference to the species and cultivar level. The use of plants in the landscape. Students must present a plant collection as part of the course requirement.

44.371 Animal Technology — A general familiarization with the livestock and poultry industries as they relate to food production. Animal physiology. Role of basic nutrients in metabolism. Nutritive requirements of livestock during growth, reproduction and lactation. Feed ration formulation. Feed additives.

44.391, 44.491 Agricultural Business Organization and Management — Business organization methods used by farm and agricultural businesses. Management applications in agriculture: goal setting, planning, resource acquisition, staffing, coordinating, controlling, monitoring the operation. Use will be made of available farm business management programs. Computer applications in agriculture. Applying knowledge in many areas to learn effective decision making.

44.392 Agricultural Business Law and Taxes — Major aspects of law and taxation as they affect agricultural producers and supply and support businesses. Property and income taxes, estate planning, laws of contract. Federal and provincial laws affecting agriculture in areas such as labor and expropriation. How to obtain and analyze information in the fields of law and taxation.

44.393 Agricultural Business Finance and Appraisal — Capital and credit in farm business administration, including sources of agricultural funds, analysis and appraisal of commercial farms, analysis of financial statements, discussion of financial controls on the farm and in related businesses, and the use of capital budgeting.

44.394 Summer Technical Report — Students prepare and present a technical report on a phase of agricultural management experienced during the 12 week practicum. Financial and decision making aspects are emphasized.

44.401 See 44.301

44.402 Process Analysis — This course acquaints students with the basic engineering aspects of the unit operations encountered in food processing. The engineering principles of raw material operations, conversion and preservation operations are covered, together with materials handling and plant design. Lab sessions involve experimentation, demonstration and problem solving.

44.411 Quality Control — The sensory evaluation of food; facility design; selection of taste panels; statistical analysis of data; laboratory measurement of consistency and texture of foods; recording and reporting with control charts; and evolutionary operations.

44.412 Food Analysis — An introduction to the chemistry of fats and oils. Practical laboratory analysis of lipids, vitamins, and minerals using the latest equipment available.

44.413 Agricultural Analysis — An introduction to the chemistry of fats and oils, with selected analyses of lipids. A practical training in soil analysis, plant analysis and fertilizer analysis using the latest equipment available.

44.414 Experimental Techniques — Design and layout of experiments using typical biological subjects. The application of the scientific method and statistical methods. Recording and presentation of experimental data. Techniques in plant histology and microscopy.

44.415 Enzymatic Analysis — An introduction to the use of enzymes to perform specific determinations of a variety of food constituents with great sensitivity and specificity. This is a relatively new and promising analytical tool. A high quality, ultra-violet spectrophotometer is used in this course.

44.431 Sanitation — Organization of a sanitation program in the food industry. The chemistry of cleaning. Properties of a good detergent. Types of cleaning compounds and formulation. Methods of disinfection and sterilization. Sanitary aspects of buildings and equipment. Safe water supply. Waste treatment and disposal. Effective insect and rodent control. Employee training in sanitary practices. Inspection techniques and lab tests.

44.442 Agricultural Mechanics — A study of basic engineering principles as applied to agricultural operations. Tractor components and maintenance. Spraying systems. Irrigation and drainage systems. Tillage and harvesting systems. Introductory environmental control. Animal waste management.

44.462 Plant Protection — The morphology and identification of weeds, diseases and insects. Life histories of representative species. Strategy of control by cultural, biological and chemical means. Currently recommended pesticides are reviewed. Pesticide safety, pest and pesticide legislation. Students are examined under the provisions of the "Pharmacy Act" for pesticide Applicator and Pesticide Dispenser certificates.

44.465 Landscape Field Practices — Maintenance practices, estimating, project programming. Landscape construction, planting procedures and use of materials.

44.466 See 44.366

44.468 Supervisory Practices — This course provides an understanding of effective supervisory practices and of organizational behavior. Knowledge of labor laws, legal and tax information and government regulations is gained as well as management of resources for improved performance.

44.481 Soil Technology — The origin, formation and classification of soils, use of survey reports, map interpretation. Components of soils, soil colloids, cation exchange reactions, soil acidity, phosphorus, nitrogen, the crop as an indicator of fertility, soil organic matters, fertilizers. Soil-sampling procedures, extraction methods used in soil analysis.

44.491 See 44.391

44.495 Crop and Livestock Management — The principles involved in management of crops and livestock. Optimizing production through application of knowledge and analysis of alternatives. Livestock disease prevention, recognition and treatment. Knowledge of good production standards will be acquired.

45.412 Silviculture and Forest Nurseries — An introduction to silviculture as practised in B.C., with emphasis on artificial regeneration of disturbed sites, using planting stock. A review of stock types used in the regeneration process, their characteristics and methods of production, and an analysis of the field conditions under which each might be used.

51.205 Introduction to Surveying — Introduction to the theory of engineering survey; practical application of linear measurements; introduction to and theory of the theodolite; bearings and traverse computations; introduction to and theory of levelling; computation of areas and volume.

Faculty and Staff

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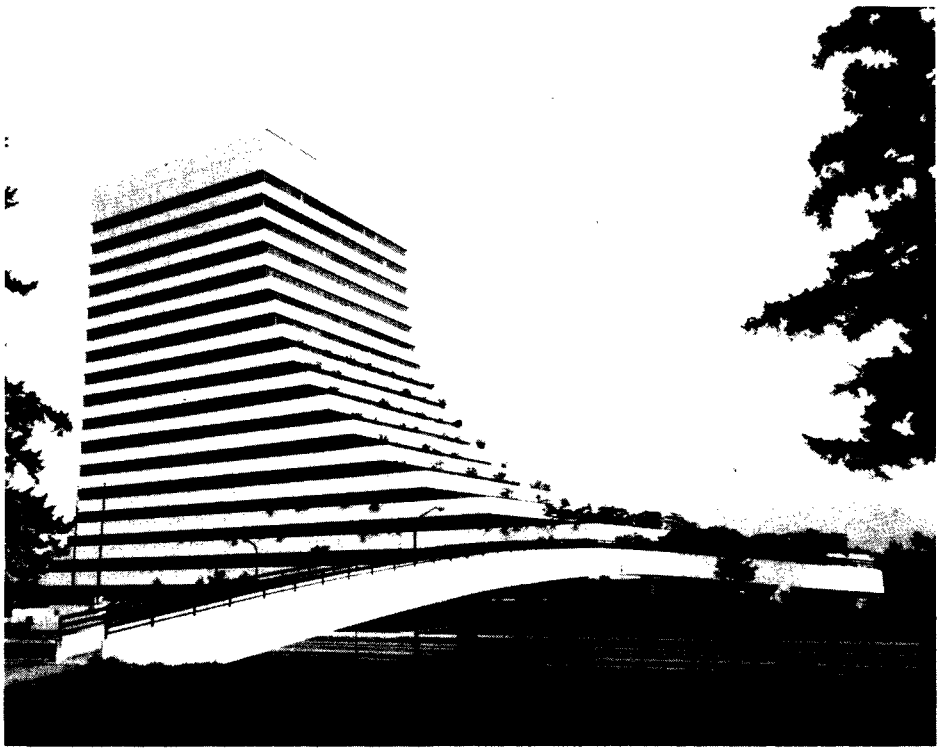


Building

Spiralling advances in technology have increased the public's expectation of their communities and the buildings constructed within them. Structures are expected to be managed and constructed to rigorous standards of workmanship and safety while at the same time incorporating all the features which contribute to speed of erection and financial efficiency. The construction industry is one of the major employment fields in Canada, turning over the largest dollar volume of business in the country.

These two factors, high public expectation of the industry and the dynamic nature of the industry, present both a challenge and an opportunity—attractive criteria for a career.

Job Opportunities

Since graduates have the advantage of understanding buildings from several perspectives—the architectural and structural elements; the mechanical, plumbing, drainage and electrical systems; the cost implications and the contractual and managerial processes—they will be able to fill technological positions which lie between the professional architect, engineer and contractor on the one hand, and the skilled tradesman on the other.

With experience, graduates become senior drafting personnel, job captains, specification writers, estimators or contracts managers, building inspectors, officials in property management departments, appraisers and assessors, partners in construction organizations and technical representatives for building supplies and equipment manufacturers. Many graduates will become estimators with general and sub-trade contractors, preparing bids and checking job costs and progress. In cooperation with the provincial government, instruction is also given in appraisal and assessment, leading to employment in these areas with public and private agencies. This growing field presents opportunities in consulting offices, assisting in design, specification writing and construction inspecting; with contractors doing estimating, shop drawings and supervision; with suppliers explaining the capabilities and application of equipment and systems; and as technicians testing and balancing mechanical installations.

The Program

The Building Technology program is designed to give both men and women a sound preparation for rewarding careers in many facets of the construction industry.

First year courses are common to all students and, in addition to English, math and physics, include various basic technological subjects. Both lecture instruction and drafting room practice are part of the program, and students are often able to further their education through summer jobs with architects, engineers, contractors or by doing inspection work for public and private agencies. In their second year, students may—subject to their demonstrated ability and departmental approval—choose one of three specialized majors.

The **Architectural** Major is intended for those students who plan to work in architectural design and drafting offices. Subjects such as design, drafting, building construction, rendering techniques and graphics are studied to enhance expertise in this area.

The **Economics** Major is concerned with costing and the evaluation of property and construction, either in the drawing stage or already constructed.

The **Mechanical Systems** Major offers subjects designed to extend expertise in the area of heating, ventilating and air conditioning.

This program is presently under review which may result in some restructuring.

Post-graduation

The Architectural Institute of British Columbia offers graduates credit for some of the examinations in their syllabus of studies for articled students.

For those students wishing to become quantity surveyors, the Canadian Institute of Quantity Surveyors will accept graduates as Probationer Members and give credit in a similar manner.

Prerequisites

Graduation from the Selected or Combined Studies Program with English 12, Algebra 12 or Math 12 plus Physics 11, all with a mark of C+ or better. Related work experience or skills will strengthen an application.

Math 12 is only acceptable if taken prior to 1978

Course of Studies

Year 1	Term 1	Clrm hrs/wk
31.140	Technical Communication	4
32.140	Basic Technical Mathematics	5
40.101	Drafting	4
40.102	Building Construction 1	6
40.104	Materials and Methods	4
40.105	Construction Site Processes	3
42.140	Building Structures 1	3
49.140	Plumbing and Drainage	3
	Library and Research	3
		35

Year 1	Term 2	2A	2B
22.240	Basic Operations Management	2	—
31.240	Technical Communication	—	3
32.240	Calculus I and II with Analytic Geometry	5	5
33.219	Applied Physics for Building Technology	4	4
40.201	Building Planning	4	4
40.202	Building Construction 2	7	6
40.203	Construction Contracts	2	—
40.204	Estimating	—	4

Year 1	Term 2 cont.	Clrm hrs/wk 2A	2B
40.205	Illumination	—	3
42.240	Building Structures 2	3	3
49.240	Heating and Ventilating	3	—
	Library and Research	5	3
		35	35

Year 2	Term 3	Arch	Econ	Mech Sys
22.340	Operations Management	2	2	2
33.319	Applied Physics for Building Technology	4	4	4
40.301	Architectural Major	6	—	—
40.302	Building Construction 3	6	—	6
40.303	Electrical Systems	4	4	4
40.304	Estimating	4	4	4
40.305	Economics Major	—	6	—
40.306	Bldg. Const. for Economics Major	—	6	—
42.340	Building Structures 3	3	3	3
49.340/ 49.341	Mechanical Systems Major	—	—	6
	Library and Research	6	6	6
		35	35	35

Year 2	Term 4A			
22.440	Operations Management	2	2	2
31.340	Advanced Technical Communication	2	2	2
32.440	Mathematical Methods and Computing	—	4	—
40.401	Architectural Major	6	—	—
40.402	Building Construction 4	6	—	6
40.403	Construction Specifications	2	2	2
40.404	Estimating	4	4	4
40.405	Economics Major	—	6	—
40.406	Building Construction for Economics Major	—	6	—
40.407	Acoustics	3	—	—
40.408	Codes and Regulations	2	2	2
42.440	Building Structures 4	3	3	3
49.410	Mech. Systems Vibration	—	—	3
49.442 49.443	Mechanical Systems Major	—	—	6
	Library and Research	5	4	5
		35	35	35

Year 2	Term 4B			
10.004	Industrial Management	—	4	4
40.401	Architectural Major	6	—	—
40.402	Building Construction 4	6	—	6
40.403	Construction Specifications	2	2	2
40.404	Estimating	4	4	—
40.405	Economics Major	—	6	—
40.406	Building Construction for Economics Major	—	6	—
40.409	Construction Contracts	2	2	2
42.440	Building Structures 4	3	3	3
49.441	Air Conditioning	—	—	3
49.444	Mechanical Systems Major	—	—	6
49.446	Mechanical Estimating	—	—	4
49.453	Air Conditioning	3	—	—
51.206	Introduction to Survey	3	3	—
	Library and Research	6	5	5
		35	35	35

Subject Outlines

10.004 Industrial Management I — Designed to give students an understanding of business management and an opportunity to apply principles and techniques through analysis of business case-problems.

22.240 Basic Operations Management — This course introduces first year Building Technology students to the principles and concepts of the manual critical data method of planning and scheduling.

22.340 Operations Management — Upon successful completion of this course, the student will understand and be able to apply a systematic problem-solving and decision-making approach to construction industry problems. The course includes computerized C.P.M. using commercially available computer packages; work study, using recognized method study techniques to examine and improve the way in which a job is accomplished; recognized work measurement techniques for estimating, planning and cost control; and total systems concept as applied to a firm or project with emphasis on supervision, interviewing, communications and organization.

22.440 Operations Management — The techniques of management problem-solving and work simplification, with particular application to engineering and industrial organizations. Includes method study, some measurement techniques, layout, planning and scheduling. The course emphasizes practical applications in the building field.

31.140, 31.240 Technical Communication — This is an applied industrial communication course that concentrates on the techniques and applications of written and spoken communication. The discussion topics, explanations, illustrations and assignments are related as closely as possible to the vocational futures of Building Technology students.

31.240 See 31.140

31.340 Advanced Technical Communication — This is an applied communications course for second year Building Technology students. It concentrates on two communication problems of particular relevance to second year students: obtaining employment and writing presentation reports. Emphasis is on written communications. If time permits, instruction will also be given on oral presentations and students will be assigned one oral report.

32.140 Basic Technical Mathematics — Topics in algebra, matrices, logarithms, trigonometry, vectors, functions and linear programming, with emphasis on problems specific to the Building Technology.

32.240 Calculus I and II with Analytic Geometry — Analytic geometry and differential calculus with ordinary and partial derivatives. Integral calculus. Applications from the Building Technology.

32.440 Mathematical Methods and Computing — Linear programming (simplex), the transportation problem and computing related to the technology.

33.219, 33.319 Applied Physics for Building Technology — A general physics course designed to meet the specific needs of the Building Technology. No formal lab program. Topics include: mechanics—kinematics, dynamics statics, energy, simple machines; electricity and magnetism—basic electric circuits, magnetic and electromagnetic effects; matter—properties of solids, liquids, gases (mechanical and thermal); heat and thermodynamics—change of states, heat transfer, solar energy, heat engines; wave motion and sound—energy transformation, characteristics of harmonic motion, resonance, basic acoustics.

33.319 See 33.219

40.101 Drafting — Elementary drafting techniques; lettering, orthographic, isometric and axonometric projection; perspective; shades and shadows. History of architecture with specific reference to technological development.

40.102, 40.202 Building Construction 1 and 2 — Principles of building construction in terms of the assembly of materials; examination of typical systems of wood and masonry construction; study of architectural detailing. Origins and purposes of building regulations; typical zoning and building by-laws; National Building Code; other Acts, codes, bylaws. Application of the above to the preparation of working drawings, in coordination with courses in building structures and building services.

40.104 Materials and Methods — This course deals with some of the more common construction materials and methods used in contemporary commercial and institutional construction in Canada. The course is divided into a series of lectures on material considerations, and a series of lab periods on construction methods.

40.105 Construction Site Processes — This course will introduce the student to job site management of construction projects. The planning, implementing and controlling of construction site processes from the point of view of the project superintendent are studied.

40.201 Building Planning — Fundamentals of design, with accent on functional aspects; planning and organization of residential space; design of simple utilitarian objects; elementary architectural design problems and presentation techniques.

40.202 See 40.102

40.203 Construction Contracts — Introduction to the fundamental nature of contracts; the basic forms of construction contracts (stipulated price and cost plus a fee) and their relationship to information and risk; other forms of construction contracts (maximum cost plus a fee and unit price); contract agreements; and an initial examination of some of the primary general conditions of construction contracts.

40.204, 40.304, 40.404 Estimating — Study and application of basic theories and principles of estimating construction costs, including methods of measurement of construction work, development of unit prices, and review of tendering procedures.

40.205 Illumination — This course deals with the types and characteristics of lighting sources, quantity and quality of light, lighting units, terminology and calculations.

40.301, 40.401 Architectural Major — Short history of contemporary architecture and building. Conceptualization and planning; theory, aesthetics and structure as integral parts of the design process. Project realization. Graphics; freehand drawing and sketching of architectural and related subjects; advanced perspective drawing in variety of media; modelmaking. Guest lecturers and field trips.

40.302, 40.402 Building Construction 3 and 4 — Principles of construction as applied to heavy timber, steel and concrete framed buildings; site fabrication and assembly; prefabrication. Theory of selection and location of materials in the building. Extensive preparation of working drawings throughout. Trips to building sites and plants.

40.303 Electrical Systems — An introduction to the theory and characteristics of single and three phase systems. Deals with ac theory and the effects of reactance, impedence, true, reactive and apparent power and power factor on energy utilization and cost.

40.304 See 40.204

40.305, 40.405 Economics Major — Principles of real property valuation, methods of appraisal, property assessment for taxation purposes, use of the assessment manual, land registration, sources of information, practical office and field work. Cost accounting and budget cost control methods at design and construction stages; development feasibility studies; financial management, contract management; bid procedures and strategy; practical work in measurement, costing, pricing and analysis.

40.306, 40.406 Building Construction for Economics Major — Principles of construction as applied to heavy timber, steel and concrete framed buildings; site fabrication and assembly; prefabrication. Theory of selection and location of materials in the building. Extensive preparation of working drawings throughout. Trips to building sites and plants.

40.401 See 40.301

40.402 See 40.302

40.403 Construction Specifications — Techniques of specifying construction work for estimating and bidding; practical applications in specifying various kinds of construction work, particularly wood-frame and reinforced-concrete systems.

40.404 See 40.204

40.405 See 40.305

40.406 See 40.306

40.407 Acoustics — Basic theory and principles including properties, propagation, sources and measurement of sound; noise criteria and control of noise.

40.408 Codes and Regulations — Topics include: building law in Canada; a survey of federal, provincial and municipal statutes, codes and regulations affecting the design and construction industry, including zoning and professional practice; concepts of control of fire hazards in buildings as applied in the National Building Code of Canada, with particular reference to use and occupancy.

40.409 Construction Contracts — Introduction to the fundamentals of contracts; the basic forms of construction contracts (stipulated price and cost plus fee) and their relationship to information and risk; other forms of construction contracts (max. cost plus fee and unit price); contracts agreements; and an initial examination of some of the primary general conditions of contract. These are continued and extended in second year.

42.140 Building Structures 1 — Basic theory of statics, including an analysis of applied and reacting forces; the relationship between forces acting on structures and the internal stresses developed. Calculations of the mathematical properties of structural sections and their resistance to bending, shearing, deflection and buckling are also studied. This course lays the groundwork for elementary structural design and is presented in lectures followed by student tutorial problem sessions.

42.240 Building Structures 2 — An introduction to the physical properties of materials used in structural sections, the performance capability of these sections under loading and their structural limitations. The course includes laboratory testing of concrete, steel and timber sections and students are instructed on the correct design and placing of concrete.

42.340 Building Structures 3 — The distribution of forces within building structures and the lateral stability and seismic resistance of frames calculated in design projects are discussed. Working stresses and factors of safety, and their effects on design are introduced through analysis of existing buildings in steel, concrete and timber. Students are familiarized with standard design catalogues and tables used in the construction industry.

42.440 Building Structures 4 — The emphasis in this course is placed on structural design associated with fieldwork. Formwork design for concrete structures is covered in detail and soils engineering is introduced. The choice of foundation systems is discussed and the safety of retaining walls and site excavations are taught through practical design projects.

49.140 Plumbing and Drainage — This course is divided into a series of labs and lectures to give students a fundamental understanding of piping, plumbing fixtures, and their application in storm and sanitary drainage systems. The B.C. Plumbing Code will be applied in the preparation of working drawings for drainage systems.

49.240 Heating and Ventilating — This course covers the principles involved with heat loss in buildings, and practises of heating and ventilating, encompassing a study of system components and design procedures. These will then be applied to the preparation of heat loss calculations and working drawings for a heating/ventilating system.

49.340, 49.442, and **49.444 Mechanical Systems Major** — Space heating; cooling and ventilating fundamentals, embodying fuel combustion; fuel handling; solar energy utilization; refrigeration; air handling; system control methods and water flow in closed loop piping systems; application of the above topics to the design of hot water space heating, ventilation, constant volume HVAC and variable volume HVAC systems; water supply systems for potable water supply and fire protection; drainage systems for sanitary and storm drainage.

49.410 Mech. Systems Vibration — Basic theory and principles in common with Acoustics (40.407). The course also covers overall systems noise control strategy; equipment sound sources, sound absorption and insulation; evaluation of sound propagated to occupied space via mechancial systems; equipment vibration control criteria; evaluation of vibration force and amplitude transmitted to the building structure from equipment distributing forces and practical measures for controlling machine vibration transmitted to piping and duct systems.

49.441, 49.453 Air Conditioning — The student will study and analyze factors influencing indoor comfort, including building solar orientation, evaluation of cooling loads, properties of air, air-conditioning processes, and gain an overview of air conditioning methods.

49.442 See 49.340

49.444 See 49.340

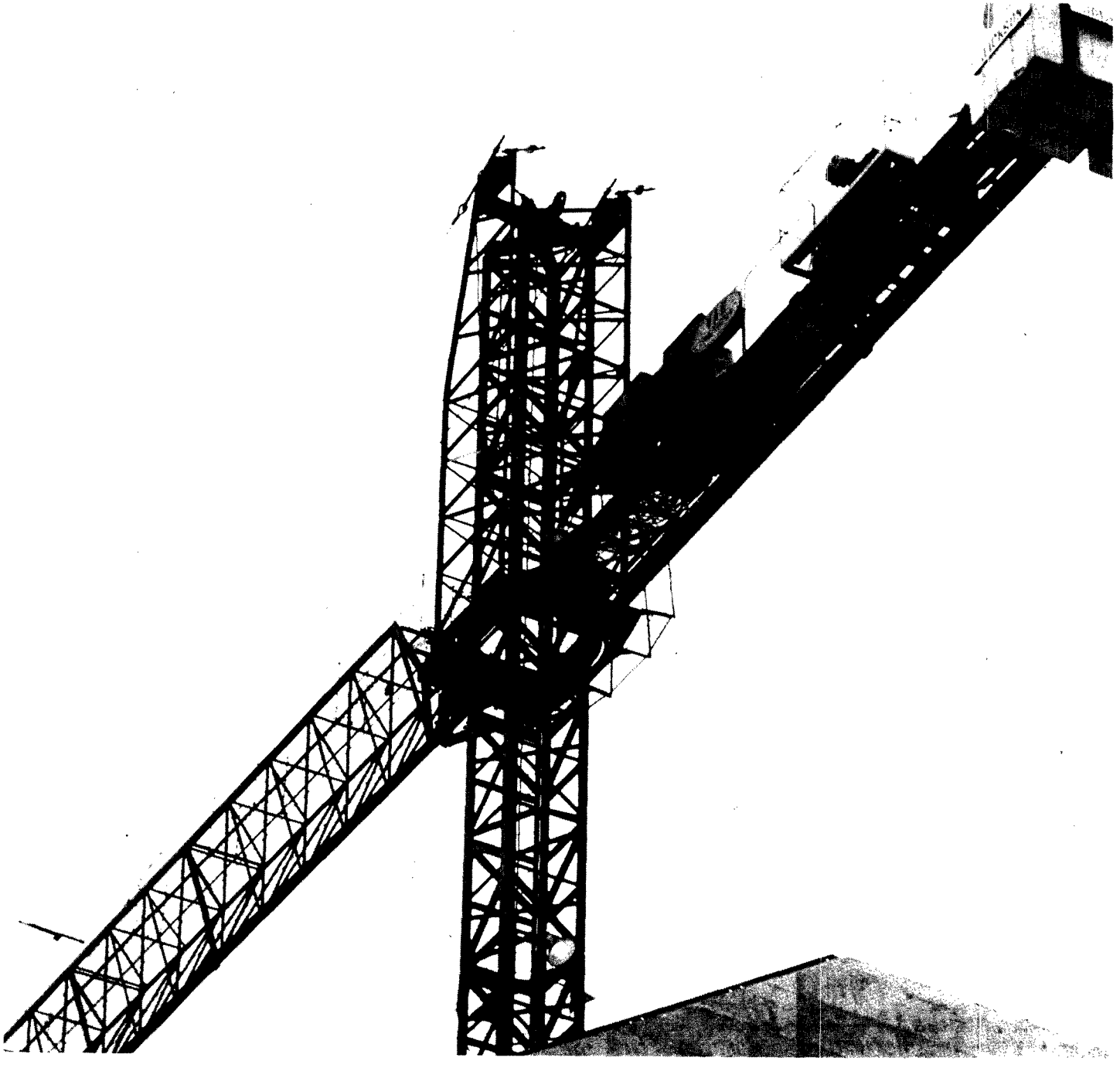
49.446 Mechanical Estimating — A practical course dealing, in particular, with measurement and pricing of mechanical work.

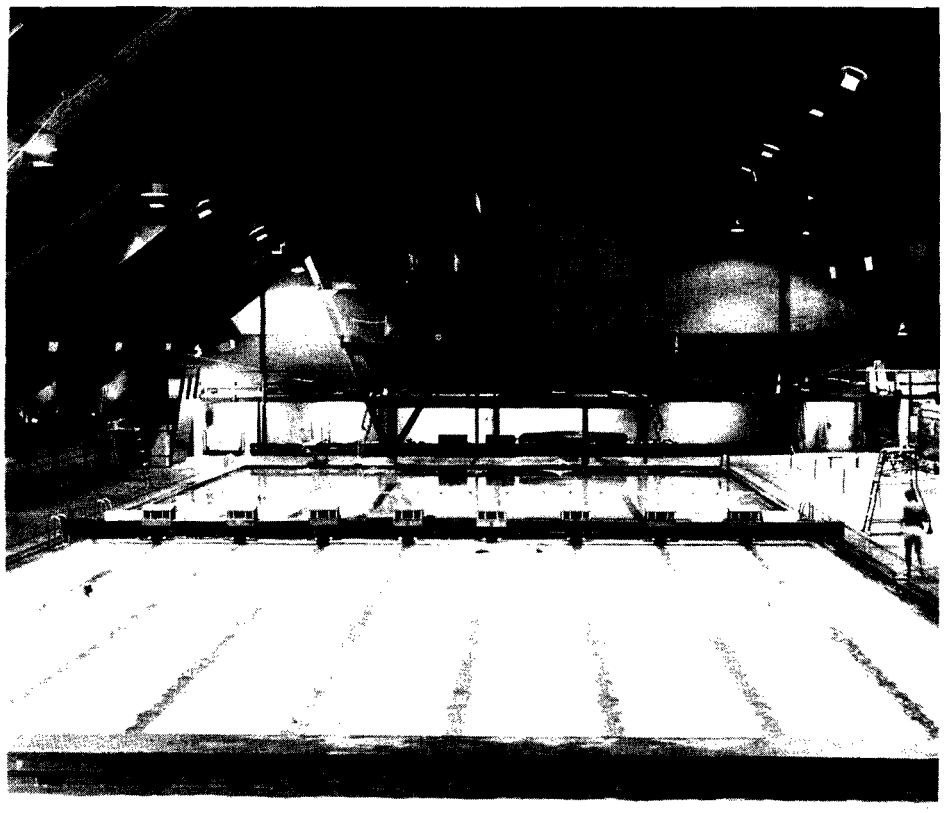
49.453 See 49.441

51.206 Introduction to Survey — An introduction to engineering survey; linear distance; introduction to theory and use of the theodolite; direction, bearing and angles; use of traverses in site engineering; elevations, use and theory of the level, and use of the plane table.

Faculty and Staff

R.I. McNeil, B.Surv., B.C.L.S., D.L.S., Dipl. Adult Ed., P.Eng., Acting Department Head
F.A.A. Alfeld, Dipl.Eng.
G. Berkenpas, Chief Instructor
F. Chan, B.Sc. (Arch.), B.Arch., M.R.A.I.C.
R. Guerin
D. C. Hale, Dipl.T.
G.M. Hardie, M.Ed., F.R.I.C.S., Program Head
D.A.D. Hickman, M.A.I.B.C., F.R.A.I.C. (on leave)
H.E. Kuckein, M.R.A.I.C., Senior Instructor
J. Lancaster, B.Comm., M.C.I.Q.S.
A. Maharajh, Dipl.T., C.E.T.
J.A. McInnes, P.Eng.
M. Stepler, Dipl.T., C.E.T., Dipl. Adult Ed.
T. Thonig, Dipl.T., C.E.T.
D.D. Workman





Recreation Facilities Management

This program should appeal to students who have a predominate interest in the management of recreation facilities. An aptitude for sports and leisure activities is desirable and an appreciation is necessary, but a keen interest in effectively managing people, programs, budgets and physical plant operations is essential. The potential manager will learn skills aimed at maximizing public utilization and enjoyment of recreational facilities by means of efficient, responsive management practices.

The graduate will be responsive to today's energy and budget conscious environment and will bring to the field skills in human relations, organization theory, personnel, accounting, food and beverage management and physical plant operation and maintenance.

Job Opportunities

The program has been developed to answer the need for qualified people able to work effectively in the public and private sectors in a wide range of facilities such as private family clubs, golf facilities (private and municipal), health spas, municipal recreation complexes, joint private and government complexes, aquatic centres, indoor winter sport centres, and ski resorts.

Graduates should be able to enter employment at different levels, depending upon past experience, or part-time job experience gained during the two-year program. It is expected that most graduates will reach the supervisory level in capacities such as assistant managers, facilities coordinators or as managers of single purpose facilities such as squash courts, arenas or pools.

In general, initial placement will occur in positions that fall between those that are specifically program-oriented and others involving senior administration of recreation facilities. With experience, graduates can become managers, superintendents, supervisors, coordinators or directors of any one of a variety of recreational facilities, public or private. Success depends upon acquired "hands on" expertise and, to some degree, program aptitude and interest.

The Program

Recreation facilities management personnel must be equipped with an understanding of accounting processes and theories; plant maintenance and operations; food and beverage management; marketing; basic management practices, including human relations, personnel, and standard engineering and architectural practices related to facilities development. Ability to effectively communicate ideas and concepts, verbally and in writing, is also important. The program will stress current thoughts and concepts in the fields of philosophy and programming for leisure and recreation, as well as the ability to effectively administer funds for the operation of leisure services.

The program will include some fieldwork projects and career guidance.

Prerequisites

Graduation from the Selected or Combined Studies Program with Algebra 12 or Math 12 and Physics 11. Related work experience or skills will strengthen an application. Admission may also be granted to mature students who can provide evidence of probable success in the program.

Math 12 is only acceptable if taken prior to 1978

Course of Studies

		Clrm hrs/wk
Year 1	**Term 1**	
22.135	Introduction to Operations Management	5
22.154	Mathematics of Finance	5
31.154	Technical Communication	3
33.122	Physics for Recreation Facilities Management	3
40.154	Recreation Facilities Building Construction	3
49.154	Physical Plant Equipment and Maintenance	5
54.101	Recreation Facilities Management	7
	Library and Research	4
		35
Year 1	**Term 2**	
20.482	Marketing Research	3
22.235	Basic Management Engineering	3
22.254	Applied Statistics	4
31.254	Technical Communication	3
33.222	Physics for Recreation Facilities Management	3
49.254	Physical Plant Equipment and Maintenance	5
49.264	Building Services (Plumbing)	4
54.201	Recreation Facilities Management	7
	Library and Research	3
		35
Year 2	**Term 3**	
10.030	Industrial Relations	4
10.040	Personnel Administration	2
14.050	Introduction to Data Processing	4
18.102	Food and Beverage Management	5
20.090	Marketing Management	4
49.354	Building Services (Heating and Ventilating)	5
54.301	Recreation Facilities Management	7
	Library and Research	4
		35

Year 2	Term 4	Clrm hrs/wk
10.031	Collective Bargaining	3
16.240	Introduction to Accounting	3
18.202	Food and Beverage Management	5
22.454	Supervision	3
40.454	Recreation Facilities Landscape Construction	3
43.452	Building Services (Electrical Systems)	3
54.401	Recreation Facilities Management	9
	Library and Research	6
		35

Subject Outlines

10.030 Industrial Relations — A detailed analysis of selected labor-management problem areas with emphasis on the solution of practical existing problems in industrial relations.

10.031 Collective Bargaining — An introductory analysis of the fundamental issues and facts of labor-management relations. Special emphasis is given to collective agreement content and interpretation, bargaining and basic labor economics.

10.040 Personnel Administration — An introduction to the fundamentals of personnel management, including organization of the personnel function; salary administration; fringe benefits; training; management development and performance appraisal; constructive discipline; grievances and morale.

14.050 Introduction to Data Processing — Training in basic data processing principles to develop recognition of the possible application of these principles in industry. The principal functions of data processing are illustrated and practised with and H.P. minicomputer operating interactively. Elementary computer programs are written and tested on the computer. Use of flow-charting and elementary data processing systems design will illustrate the achieving of data processing objectives.

16.240 Introduction to Accounting — An introduction to financial accounting that includes a survey of the accounting process and a review of basic accounting theory. Preparation of financial statements, analysis of financial statements and the reporting of financial information to outsiders is covered in depth. Also covered is: accounting for assets, liabilities, owner's equity and payroll accounting.

18.102, 18.202 Food and Beverage Management — Background of industry; sanitation; meal planning, costing and menu preparation; selection of foods; purchasing methods; principles of food preparation; equipment layout and specifications; service of foods; administrative requirements; organization of internal and external catering services.

18.202 See 18.102

20.090 Marketing Management — This introduction to the marketing environment and marketing institutions includes a detailed study of the basic marketing functions; marketing research; product planning; selection of trade channels; merchandising; advertising; sales promotion, and salesmanship. Marketing of consumer goods, as well as industrial goods will also be covered.

20.482 Marketing Research — The purpose of the course is to examine the basic approaches to marketing research, discuss the technique tools and relate these tools to the decision-making process. Emphasis is placed on the use of market research in the total marketing decision concept. Special application of marketing research and simulated real-life situations will be examined.

22.135 Introduction to Operations Management — A study of the business firm with respect to its organization and functions. Emphasis is placed on how the operations management graduate will fit into the organization. This will be accomplished through discussions, field trips to local industries and related case problems. Additional areas of interest include business law and government regulations involving the working environment.

22.154 Mathematics of Finance — Review of basic algebra, trigonometry and graphing techniques. Other topics covered include basic mathematics of finance, note discounting, simple and compound interest, the concept of present value and cash flow, loan payment plans, annuities, mortgages, sinking funds, depreciation methods, techniques of evaluating investment alternatives, and basic inventory management mathematical techniques.

22.235 Basic Management Engineering — Approaches to problem-solving and work simplification, with particular application to hotel and restaurant operations. Includes method study, some measurement techniques, and facilities layout and systems concepts.

22.254 Applied Statistics — An introduction to the use of statistics in business; descriptive statistical techniques involving the collection and treatment of data and elementary probability. The course also covers an introduction to inferential statistics through selected topics such as sampling, confidence limits, hypothesis testing, and linear regression. A statistical research project, applied to recreation facilities management, is a requirement of the course.

22.454 Supervision — This course introduces the student to some of the skills required to implement short-range managerial decisions with the resources available at the first level of supervision.

31.154, 31.254 Technical Communication — The course is divided into a one-hour lecture and a two-hour lab per week. In the lecture, students receive information on basic writing and communicating skills, reading and study skills, business correspondence and related writing tasks, audiovisual techniques, oral presentations and reports. The lab hours are used to practice these skills. There are approximately ten assignments each term, each assignment designed to develop a specific communication skill that the student will need in his/her field.

31.254 See 31.154

33.122, 33.222 Physics for Recreation Facilities Management — A general physics course designed to meet the needs of the Recreation Facilities Management Technology. No formal laboratory program. Subjects covered include: kinematics, dynamics, statics, energy, simple machines; basic electrical circuits; magnetic and electromagnetic effects; mechanical and thermal properties of solids, liquids and gases; change of state, heat transfer, heat engines and refrigeration; light and illumination; sound and sound insulation.

33.222 See 33.122

40.154 Recreational Facilities Building Construction — A functional analysis of space planning, public safety regulations and structural systems. Drafting and drawing intepretation relative to recreation facilities will be studied.

40.454 Recreational Facilities Landscape Construction — The elements of landscape, as applied to recreational facilities. Topics include site analysis; grading and drainage relative to pedestrian and vehicular circulation; sports and playground facilities; and drafting, as described above.

43.452, 49.264, 49.354 Building Services — Introduction to building service systems in regard to water supply, drainage, heating, ventilating and electrical systems.

49.154, 49.254 Physical Plant Equipment and Maintenance — The course is highly descriptive and qualitative, treating the various mechanical systems and equipment items commonly required in recreational facilities, in terms of performance, operating principles, and application. The course covers air-conditioning systems; refrigeration and artificial ice installations; swimming pools; fire protection systems; elevators and escalators; boilers, pumps and fans. In addition, a brief treatment of electric motors and switchgear is included. The laboratory periods are comprised of problem-working sessions, demonstrations, and field trips.

49.254 See 49.154

49.264 See 43.452

49.354 See 43.452

54.101, 54.201, 54.301, 54.401 Recreation Facilities Management — Each term will emphasize a different aspect of current thinking in the recreation and leisure services industry. Theories, trends, and applications of recreation and leisure services management are discussed. Four major subjects are covered: management of recreation services, maintenance of recreation facilities, programming of recreation facilities and philosophy of leisure and recreation. One term is devoted to each major topic. Visits to local facilities will complement lecture and lab material when appropriate, and the fourth term will include directed field work.

54.201 See 54.101

54.301 See 54.101

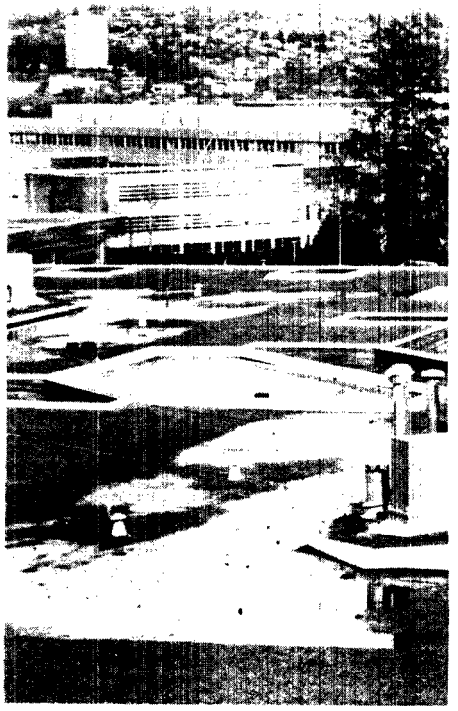
54.401 See 54.101

Faculty and Staff

S.C. Todd, M.I. Mech.E., C.Eng., F.I.E.D., P.Eng., *Department Head*

M.D. Powley, B.Ed., M.B.A., Program Head

E.W. Wilmink, B.Rec.



Lumber and Plywood

British Columbia's leading industry is rapidly adopting advanced technology for the production of lumber and plywood. New plants use computerization with automated processes to convert raw material into end products which are in demand on local and world markets.

Job Opportunities
Young men and women with management skills are needed in B.C.'s largest industry to fill positions in supervisory, technical, marketing and sales jobs.

Graduates from this technology are found in key jobs throughout B.C.'s wood products industries. Most are employed where management skills are needed as supervisors, foremen, mill managers, sales people and sales managers, traders and quality control technicians or supervisors. Graduates are also employed in many other areas where their management-oriented training is valued.

The Program
First year students in the Lumber and Plywood Program study basic sciences and introductory courses including wood science, log utilization, and lumber tallying and grading. In the second year there is increased emphasis on manufacturing techniques, process control and economics. Second year courses also emphasize management skills in such applications as computers, mill supervision, sales and distribution, and business communications.

Classroom instruction is heavily augmented by field trips to coastal and interior operations.

Prerequisites
Graduation from the Selected or Combined Studies Program with Algebra 12 or Math 12 and one Science 11, Biology, Chemistry or Physics. Applicants are sought who possess initiative, a sense of responsibility, and an interest in leadership and teamwork within industry. Industrial experience lends strength to an application.

Math 12 is only acceptable if taken prior to 1978.

Scholarships
Various industry-sponsored scholarships and awards are available to students in the Program. Further information is available from BCIT Counselling staff and the Lumber and Plywood Technology staff.

Course of Studies

Year 1	Term 1	Clrm hrs/wk
31.146	Technical Communication	3
32.146	Basic Technical Mathematics	5
33.118	Physics	5
46.101	Forest Utilization	7
46.115	Lumber Grading I	2
46.198	Lumber Tallying*	2
46.199	Log Utilization	4
	Term 1 cont.	
49.101	Drafting Fundamentals	2
	Tutorial	1
	Library and Research	4
		35
Year 1	**Term 2A**	
31.246	Technical Communication	3
32.264	Statistics and Quality Control	5
33.218	Physics	5
41.208	Engineering Materials	3
46.215	Lumber Grading II*	8
46.220	Wood Properties	4
49.205	Drafting	2
	Library and Research	5
		35
Year 1	**Term 2B**	
31.246	Technical Communication	3
32.264	Statistics and Quality Control	5
33.218	Physics	5
41.208	Engineering Materials	3
46.215	Lumber Grading II*	8
46.220	Wood Properties	4
49.205	Drafting	2
	Library and Research	5
		35

46.399 A summer technical report will be required for students continuing into second year.

Year 2	Term 3	Clrm hrs/wk
14.321	Computer Applications	3
22.346	Operations Management I	3
31.346	Advanced Technical Communication	2
43.354	Electrical Equipment Applications	4
46.315	Wood Processing I	10
46.370	Mill Services I	8
46.399	Summer Technical Report	1
	Library and Research	4
		35
Year 2	**Term 4A**	
14.408	Linear Programming	3
20.110	Wood Products Sales and Distribution	4
22.446	Operation Management II	4
31.446	Advanced Technical Communication	2
46.415	Wood Processing II	9
46.470	Mill Services II	6
49.471	Mechanical Equipment	3
	Library and Research	4
		35
Year 2	**Term 4B**	
14.408	Linear Programming	3
20.110	Wood Products Sales and Distribution	4
22.446	Operations Management II	4
31.446	Advanced Technical Communication	2
46.415	Wood Processing II	9
46.470	Mill Services II	6

		Clrm
Year 2	**Term 4B cont.**	hrs/wk
49.471	Mechanical Equipment	3
	Library and Research	4
		35

**The attainment of a recognized industrial certificate with a minimum mark of 70 per cent is required as a condition of graduation.*

Subject Outlines

14.321 Computer Applications — Computer applications in engineering technologies; how a computer works; recognizing problems suitable for computer solution; flow-charting; and communicating with computer personnel. Emphasis is on the use of computers to solve problems related to the technology. Where available, "package" programs are demonstrated and used by students. FORTRAN or BASIC programming language is taught.

14.408 Linear Programming — Graphical method; algebraic method; simplex method; analysis of simplex results; LKP problem formulation; use of computer to solve problems; analysis of computer solution; use of reduced costs and shadow prices; sensitivity analysis; practical applications and limitations of LP; implementation of results.

20.110 Wood Products Sales and Distribution — This course examines the major domestic and export markets for lumber and plywood, including ongoing changes in all types of distribution and transportation systems used by the forest products industry. The sales process, from telephone solicitation to complete documentation of FOB and CIF orders, is covered in detail.

22.346 Operations Management I — An organized approach to problem-solving, with emphasis on the forest products industry. Method study techniques such as problem selection, process charting, multiple activity charting, activity sampling, motion economy, and critical examination and development of alternatives are covered. The course also includes an introduction to work measurement. The importance of establishing good human relations with employees is stressed throughout.

22.446 Operations Management II — The techniques required to solve plant layout and materials handling problems are covered and the student applies these techniques to a comprehensive inhouse project. As a term project the student selects, for study, a job in an industrial plant in the forest products industry. The student applies the techniques learned in 22.346 and the first part of 22.446 to the solution of his plant project and submits a written report on his findings, including conclusions and recommendations.

31.146, 31.246 Technical Communication — This course prepares the student for writing technical material relevant to the forest products industry. In a one-hour lecture and a two-hour lab each week, the student studies and practices the principles of clear, concise and precise writing. The student learns to apply these skills to various business formats i.e. descriptions of hardware and processes, directions, summaries, letters and memos and technical reports.

31.246 See 31.146

31.346, 31.446 Advanced Technical Communication — In a two-hour lab each week, students discuss and practice the writing process in general, and technical reports and correspondence in particular. Students are expected to complete about one writing assignment per week, ranging from one-page letters and memoranda to ten-page formal technical reports. In addition, students study and practice oral communication skills and principles of logical reasoning.

31.446 See 31.346

32.146 Basic Technical Mathematics — Topics in algebra, logarithms and trigonometry with emphasis on technical applications, including linear programming.

32.264 Statistics and Quality Control — An introduction to statistics covering the organization and presentation of data, measures of central tendency and dispersion, probability distributions, estimation and hypothesis testing and, in addition, linear regression, non-parametric statistics and topics in quality control.

33.118, 33.218 Physics — An introductory level course covering statics, dynamics, momentum, force, friction, energy, power, angular momentum, simple machines, properties of solids, fluids, fluid mechanics, thermal properties of matter, thermal energy, basic electricity and magnetism, optics and atomic and nuclear phenomena.

33.218 See 33.118

41.208 Engineering Materials — A comparison of materials important in forest products industries, including wood and wood products, concrete, metals, alloys, polymers and ceramics. Common causes of failure in service including corrosion, wear, fatigue and embrittlement. Lab sessions emphasize physical testing and non-destructive testing.

43.354 Electrical Equipment Applications — Topics include ac and dc motors and their application in sawmills, distribution equipment, protective equipment, and metering equipment. Students also learn characteristics of electrical systems, economic factors, the importance of power factor, safety and an introduction to solid state devices as used in sawmill equipment.

46.101 Forest Utilization — An introduction to the manufacture of forest products. Topics include elementary botany, identification of British Columbia commercial tree species, forest management and logging, macro- and micro-wood technology and wood defects as they relate to lumber quality. The processing and handling of wood in preparation for lumber manufacturing—debarking, chiping, screening, conveyance and storage.

46.115 Lumber Grading I — This course is given in term I in preparation for Lumber Grading II. The course covers information fundamental to the grading of western softwood lumber, including tree growth and wood structure, species identification, classification of products and the recognition of characteristics found naturally and caused in manufacture.

46.198 Lumber Tallying — A full course on the tallying and shipping of lumber, followed by an industrial examination. The following topics are covered: conversion of order data to quantities in foot-board measure, specified lengths, pieces, bundles and packages; information on moisture content and shrinkage of wood, metric conversion and lumber price calculations. Final examinations for certification are given by The Council of Forest Industries (C.O.F.I.), 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.

46.199 Log Utilization — This course introduces the basic log-scaling procedures used in coastal mills and also includes different log-sorting methods and recovery calculations used in sawmill and plywood industries. Considerable time is spent practicing scaling techniques on selected log booms.

46.215 Lumber Grading II — Students attend industry lumber grading classes sponsored by the Council of Forest Industries (C.O.F.I.) and receive further instruction at BCIT. Final examinations for certification are given by C.O.F.I., 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.

46.220 Wood Properties — Topics covered include wood and chip units and conversion factors, mechanical and rheological properties, micro- and ultra-structure, wood protection and preservation. The lab section of this course is largely made up of a research project, with emphasis on reporting of methods and results.

46.315, 46.415 Wood Processing I and II — Students receive instruction in sawmill and planer-mill operation, sawing technology, lumber seasoning, plywood and

particle-board manufacture and shipping procedures. Methods of controlling quality, recovery and productivity are examined and coastal and inland operations are compared in the classroom and/or field trips.

46.370, 46.470 Mill Services I and II — This course is designed to supplement material covered in Wood Processing I and II (46.315, 46.415). 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.

46.399 Summer Technical Report — Students make a detailed report on one phase of the technical operation of a forest products plant, from first-hand experience or from approved research sources.

46.415 See 46.315

46.470 See 46.370

49.101 Drafting Fundamentals — Techniques of reading and producing orthographic drawings using standard format, and the development of basic skills in applying these techniques. Use of instruments, line work, geometric constructions, orthographic projection, isometric drawing and sketching, sections, dimensioning and threads and fasteners, as required.

49.205 Drafting — Covers topics on intersections, developments, descriptive geometry, isometrics and piping, drawings and mechanical equipment detail, and layout projects associated with lumber production. Prerequisite: Drafting Fundamentals (49.101).

49.471 Mechanical Equipment — A study of mechanical equipment relating to the transmission, application and control of power, with particular reference to the wood processing industry. Topics include line shafting, flexible couplings, V-belt and roller chain drives, gearing, variable speed drives; hydraulic and pneumatic systems, centrifugal pump applications and lubrication and bearings. Reference is made to steam generation, steam processes and power generation, as well as preventive maintenance.

Faculty and Staff

I.M. Anderson, M.I. GasE., E.Eng., *Department Head*
H. Kettner
J.T. Neilson, B.A.Sc., P.Eng.

Chemical Sciences

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 problems of environmental pollution. 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; as engineering assistants in consulting firms; as production supervisor trainees in production plants; as laboratory field analysts in environmental laboratories and waste disposal units; as assayers or mineral processing technicians in extractive metallurgy plants; as process technologists in pulp mills and as corrosion specialists and non-destructive testing specialists.

The Program
The Chemical Sciences Program offers the student grounding in general science and technology courses in the first year of studies, with the opportunity for further specialization in second year.

The first year curriculum emphasizes applied chemistry, general laboratory procedures and testing, and introduces the student to a wide range of industrial chemical processes.

In the second year Analytical Chemistry and Unit Operations are compulsory throughout, while most other courses are chosen on an elective basis, depending on which technology the student wishes to specialize in. The following technologies are offered: **Industrial Chemistry**, **Laboratory Chemistry**, **Pollution Sciences**, **Pulp and Paper**, **Extractive Metallurgy**, **Physical Metallurgy**.

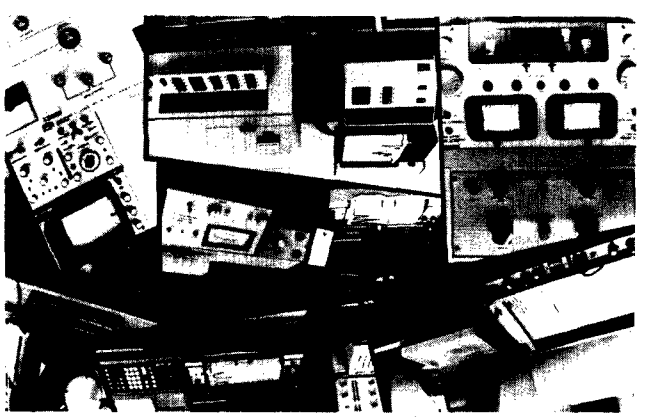
Prerequisites
Graduation from the Selected or Combined Studies Program with Algebra 12 or Math 12 and Chemistry 11.

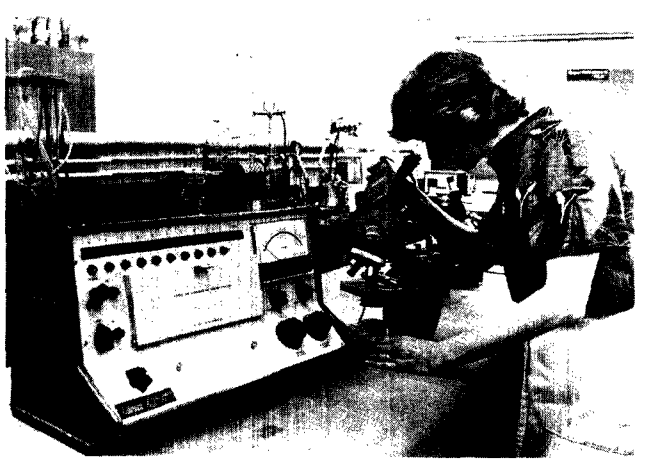
Math 12 is only acceptable if taken prior to 1978.

Course of Studies

Year 1	Term 1	Clrm hrs/wk
30.101	Applied Chemical Principles	6
31.141	Technical Communication	3
32.141	Basic Technical Mathematics	5
33.114	Physics	5
41.103	Engineering Materials	3½
41.119	Environmental Science	4½
49.104	Drafting	4
	Library and Research	4
		35

Year 1	Term 2	2A	2B
30.201	Applied Chemical Principles	6	6
30.204	Chemical Laboratory Techniques	3	3
31.241	Technical Communication	3	3
32.241	Statistics I and Calculus I	5	5
33.214	Physics	5	5
41.202	Laboratory Workshop	1½	1½
41.203	Engineering Materials	3½	3½
41.246	Industrial Chemical Processes	4	4
	Library and Research	4	4
		35	35





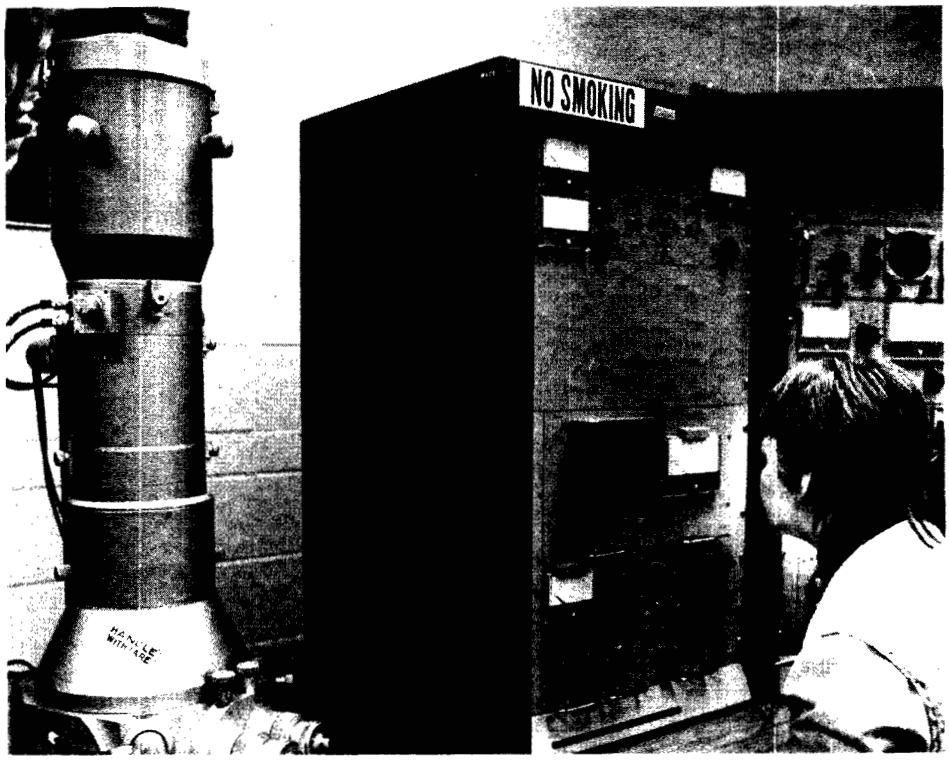
Laboratory Chemistry Electives
These courses include Organic Chemistry, Environmental Analytical Methods, Ore Analysis, and Analytical Instrumentation. Together with Analytical Chemistry, they will provide students with the systematic study of the theory and application of modern instrumental analysis necessary for work in mineral, food, drug, environmental, petroleum and other industrial analytical laboratories. Students also become capable of performing analytical work in classical analysis with minimum on-the-job training.

Pollution Science Electives
These courses include Pollution Science, Environmental Analytical Methods, Waste Management, and Pollution Control. They deal with the environmental problems of modern industrial society and provide specialization in the chemical detection methods and engineering control techniques for air and water contaminants. Graduates of this program are qualified to perform the detailed pollutant analyses required by industrial and government laboratories and engineering firms. They are also qualified to conduct general laboratory analyses in other areas such as food, petrochemicals, pharmaceuticals and ore assays.

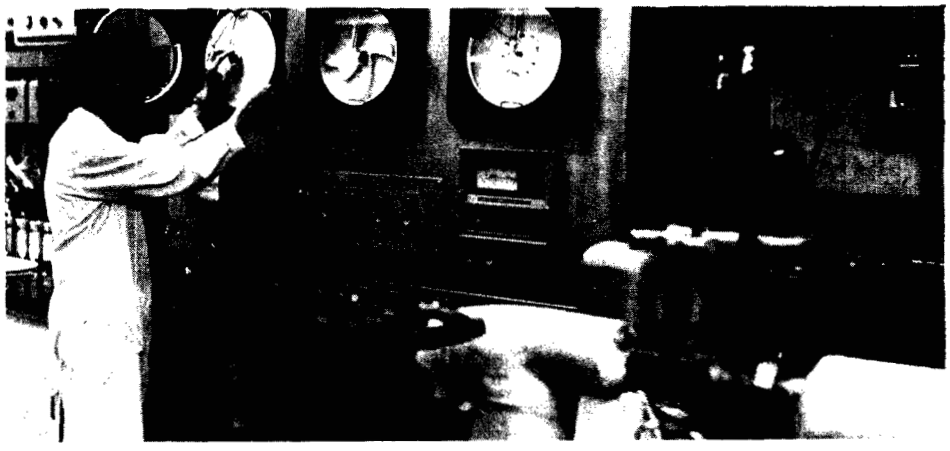
Industrial Chemistry Electives
These courses include Organic Chemistry, Unit Operations, Process Instrumentation, Process Dynamics and Pollution Control. They qualify the graduate to work as a process technologist in a great variety of chemical process industries.

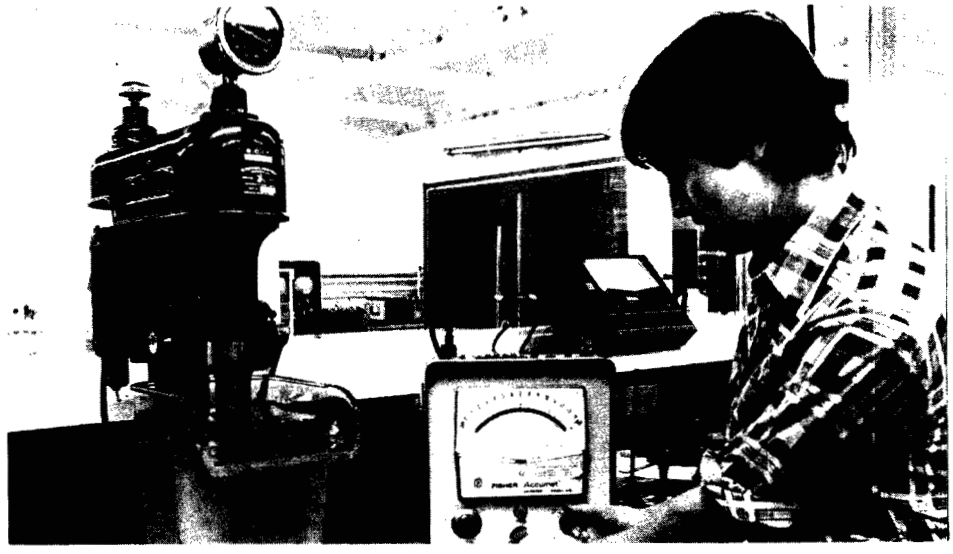
Pulp and Paper Electives
These courses include Pulp and Paper Technology, Process Instrumentation, Process Dynamics and Waste Management. They provide the specialization in pulp and paper manufacture, wood chemistry, quality control and pollution abatement required by the pulp and paper industry. Students benefit from the presence of a fully equipped, operational pilot plant facility on the BCIT campus.

Extractive Metallurgy Electives
Extractive Metallurgy is that branch of science and technology which deals with obtaining mineral concentrates and metals from ores. These courses include Extractive Metallurgy, Ore Analysis, Process Dynamics, Process Instrumentation and Coal Chemistry. Graduates find employment either as laboratory analysts or as metallurgical process technologists.



Physical Metallurgy Electives
These courses, which include Physical Metallurgy and Engineering Materials, lead to specialization in physical testing of materials, microscopy and non-destructive testing.





Students must take all the common courses listed for term 3, plus one elective.

Year 2	Term 3	
	Common	
30.310	Physical Chemistry	5
30.314	Analytical Chemistry	6
32.341	Numerical Methods and BASIC	5
41.320	Unit Project	2
41.341	Unit Operations	6
	Library and Research	5
	Electives	
30.309	Organic Chemistry	6
41.304	Physical Metallurgy	6
41.307	Extractive Metallurgy	6
41.311	Pollution Science	6
41.346	Pulp and Paper Technology I	6
		35

Students must take all the common courses listed for term 4, plus six electives.

Year 2	Term 4	4A	4B
	Common		
30.414	Analytical Chemistry	6	6
41.441	Unit Operations	6	6
	Library and Research	5	5
	Elective 1		
30.409	Organic Chemistry	6	6
41.404	Physical Metallurgy	6	6
41.407	Extractive Metallurgy	6	6
41.411	Pollution Science and Microbiology	6	6
41.446	Pulp and Paper Technology II	6	6
	Elective 2		
41.408	Ore Analysis	3	3
41.412	Waste Management	3	3
	Elective 3		
41.413	Environmental Analytical Methods	3	3
47.409	Process Dynamics	3	3
	Elective 4		
32.441	Calculus II and Differential Equations	3	3
41.420	Unit Project	3	3
	Elective 5		
30.416	Analytical Instrumentation	3	—
43.457	Process Instrumentation	3	—
	Elective 6		
41.438	Coal Chemistry	—	3
41.448	Industrial Chemistry and Pollution Control	—	3
43.457	Process Instrumentation	—	3
		35	35

Subject Outlines

30.101 Applied Chemical Principles — Provides the necessary background for chemical calculations and analysis. Included are stoichiometry, atomic structure, bonding, solution preparation and acid-base and oxidation-reduction reactions and titrations. Simple chemical equilibrium leads to a good working knowledge of pH, buffer solutions, solubility product, selective precipitation and industrial processes involving equilibria. Lab work consists of simple qualitative and quantitative analysis and good lab technique is taught.

30.201 Applied Chemical Principles — A continuation of 30.101 giving detailed coverage of gravimetric and columetric analysis and qualitative analysis of cations and iminos. Electrochemistry includes cells, electroplating and corrosion. Simple physical chemistry provides theory of solids, liquids and gases leading to fractional distillation and colligative properties. The Periodic Table is used to correlate many properties of elements and compounds. Names and properties of some organic compounds are covered and lab work covers qualitative and quantitative analysis and physio-chemical separations. Throughout 30.101/201 attention is given to industrial and everyday applications.

30.204 Chemical Laboratory Techniques — This course teaches basic techniques in sampling, weighing, moisture determination, ashing, extractions, filtration gravimetric methods and volumetric methods. Instrumental analysis and separation methods will be described, demonstrated and whenever possible, practised.

30.309, 30.409 Organic Chemistry — A general course covering properties, preparations and reactions of all major classes of organic compounds—aliphatic and aromatic hydrocarbons, halides, alcohols, ethers, carboxylic acids and derivatives of carboxylic acids, aldehydes, ketones, amines, amino acids, carbohydrates, heterocyclics, dyes, and polymers. Lab work emphasizes organic techniques, qualitative chemical analysis and instrumental methods, infra-red, ultraviolet and gas chromatography.

30.310 Physical Chemistry — This course presents the kinetic theory of gases, the first and second laws of thermodynamics, phase equilibria, chemical kinetics and catalysis. Lab work consolidates lecture material and gives experience in practical physio-chemical measurements.

30.314, 30.424 Analytical Chemistry — Conventional inorganic methods of analysis for determining the common metals in ores and alloys. Basic methods of fire assaying for gold and silver are also covered.

30.409 See 30.309

30.414 Analytical Chemistry — Advanced analytical techniques using various instruments such as the polarograph, spectrophotometer, colorimeter, gas chromatograph, spectrograph, X-ray scintillometer and X-ray diffractometer.

30.416 Analytical Instrumentation — This course covers the practical aspects of the following topics: chemical cells and electrodes, electrical measurements, potentiometric recorders, power supplies, operation amplifiers, recording potentiometric and amperometric titration and instrumentation in d.c. polarography.

31.141, 31.241 Technical Communication — This course is designed to introduce students to the techniques and tools used in communicating technical information to people in business and industry. On completion of the two courses, students should be capable of analyzing information and designing an information package—report, proposal and letter or memo —for business or industrial audiences.

31.241 See 31.141

32.141 Basic Technical Mathematics — Topics in algebra, logarithms and trigonometry, including graphical linear programming.

32.241 Statistics I and Calculus I — An introduction to statistics and calculus. The statistics portion includes organization and presentation of data; measures of central tendency and dispersion; frequency distributions; sampling and estimation. The calculus section covers the differentiation and integration of algebraic functions, together with their applications.

32.341 Numerical Methods and BASIC — Elements of the BASIC computer language up to and including arrays and subprograms. Numerical methods in theory and practice; solution of simultaneous equations by Gauss-Jordan methods; linear programming and Simplex methods; interactive methods in solving algebraic and transcendental functions; numerical integration.

32.441 Calculus II and Differential Equations — Calculus of logarithmic, exponential and trigonometric functions; integration by parts and by trigonometric substitution. Partial functions. Separable variable differential equations; use of integrating factor; applications of first order differential equations.

33.114, 33.214 Physics — An introductory level course covering kinematics, dynamics, function, statics, angular motion, energy, momentum, simple machines, properties of matter, fluid mechanics, temperature and heat, thermal properties of matter, basic electricity and magnetism, wave motion and sound, electromagnetic waves, optics and atomic and nuclear phenomena. The lab program stresses the subjects of measurements, data analysis, experimental technique and report writing. Mathematical treatment requires algebra and trigonometry.

33.214 See 33.114

41.103, 41.203 Engineering Materials — Physical testing of materials including metals, plastics, wood and wood products, concrete, ceramics and soils. Nondestructive testing. Microscopy, photomicrography and photography.

41.119 Environmental Science — An introduction to pollution measurement and control techniques.

41.202 Laboratory Workshop — Instruction in basic workshop techniques, including glass blowing, soldering, brazing and gas welding. Use of hand and bench tools.

41.203 See 41.103

41.246 Industrial Chemical Processes — A description of the chemical processes involved in major industrial chemical plants in B.C. Emphasis is placed on chemicals and chemical operations associated with the pulp and paper industry, including chemical pulping, water treatment, chloralkali and sulfuric acid. Lab sessions involve the testing and control procedures utilized in industrial applications.

41.304, 41.404 Physical Metallurgy — Solidification of metals, casting methods and defects, metal-forming operations, phase diagrams, alloying of metals, heat-treatment. Lab sessions emphasize physical testing of materials, metallography and non-destructive testing.

41.307, 41.407 Extractive Metallurgy — This course is concerned with the unit operations of coal and nonferrous metals recovery and upgrading and with the unit processes of nonferrous and precious metal recovery from ores and concentrates. Mineral processing covers the basic operations of comminution, particle size analysis, classification, screening, flotation, gravity separation. Extractive metallurgy covers the fundamental principles and processes of hydrometallurgy, pyrometallurgy and electrometallurgy. Solutions to design and operating problems are emphasized.

41.311 Pollution Science — An introduction to organic chemistry, with applications to industrial pollution problems.

41.320, 41.420 Unit Project — Projects relating to the student's chosen specialty are assigned each term. Regular progress reports and a final term report are required.

41.341, 41.441 Unit Operations — First and second law of thermodynamics; enthalpy, entropy, phase rule thermodynamic diagrams and tables; properties of steam; fluid flow and measurement in pipes and channels, piping, pipe fittings and valves; flow of heat, conduction, convection, radiation, film and overall transfer co-efficients, heat exchangers; principles and application of equipment for evaporation, distillation, absorption, extraction; humidification and dehumidification; drying; solid-liquid and liquid-liquid extraction.

41.346, 41.446 Pulp and Paper Technology I and II — Pulp and paper technology is concerned with mechanical and kraft pulping, chemical and heat recovery, bleaching, papermaking, newsprint manufacture, process control and product testing. The lab portion of this course is designed to equip students with basic testing skills and provide "hands-on" experience with typical mill unit operations. Projects are undertaken in term 4 to involve students in planning and carrying out practical project work.

41.404 See 41.304

41.407 See 41.307

41.408 Ore Analysis — A survey of analytical methods to determine the elemental constituents of ores, concentrates, alloys and metal products. Laboratory work includes principles and practice of gravimetric, volumetric, complexometric and spectrophotometric methods of analysis.

41.411 Pollution Science and Microbiology — The following topics are discussed: air pollution meteorology, air pollution chemistry, air sampling methods, classical and instrumental techniques for measuring atmospheric and indoor contaminants (e.g. hydrogen sulfide, mercaptan, sulfur oxides, carbon monoxide, ozone, nitrogen oxides, various organic contaminants, and lead, mercury, cadmium and zinc in air, etc), particulate counting and sizing, stack sampling and some of the principles and techniques used in water pollution microbiology. Laboratory sessions include standard methods used by industrial and government laboratories.

41.412 Waste Management — Physical, biological and chemical methods used in treating municipal and industrial wastewaters.

41.413 Environmental Analytical Methods — This course surveys suitable methods of examining many types of water, waste water and materials related to control of sanitation and water quality. Reference is made to the "Standards Methods" for the analysis of water and waste water, 13th edition, published by the American Public Health Association. However, in many instances adaptations and improvements are introduced. Typical industrial pollution problems related to local industry are discussed during lab periods, and special attention is given to proper sampling techniques. Ecosystems are discussed, leading to various methods from B.O.D.-analysis and C.O.D. A selection is made from the following analysis of field samples: cyanide (Serfass distillation method), pesticides (sampling, extraction, clean-up and detection methods), arsenic, mercury, nitrogen (ammonia, nitrate, organic), oxygen (D.O., B.O.D., C.O.D.), surfactants, phosphates (total, ortho, poly), sulphates, chlorides, proteins, carbohydrates, tarmin and lignin, phenols, heavy metals (Cu, Fe, Pb, Cr, Hg, and Cd). Two field trips on practical water sampling and the provincial environmental water resources lab are included.

41.420 See 41.320

41.438 Coal Chemistry — An introduction to coal chemistry with emphasis on coal preparation and coal testing techniques.

41.441 See 41.341

41.446 See 41.346

41.448 Industrial Chemistry and Pollution Control — This is a survey course covering the major chemical process industries and their pollution control methods. Lecture material is selected from the following topics: chlorine and caustic, aluminum production, petroleum refining, pulp and paper, metal refining, plastics, phenol and resins, nuclear energy and other sources of energy.

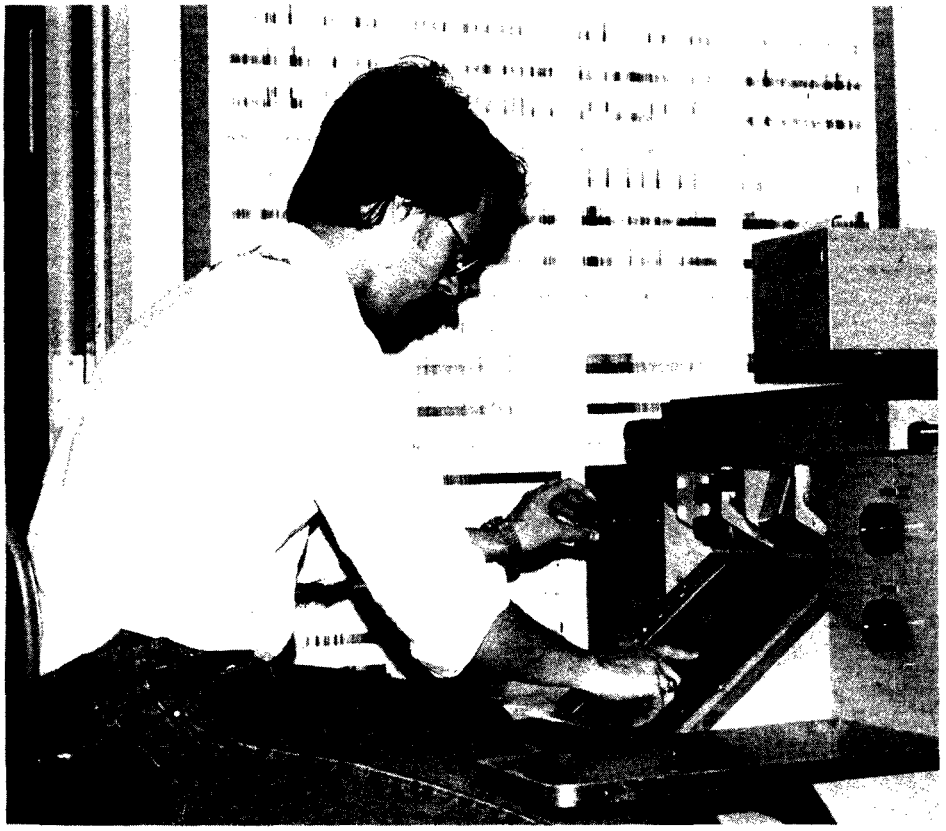
43.457 Process Instrumentation — An orientation course with emphasis on lab exposure to industrial equipment. Standard methods of applying commercial instruments to measure pressure, level, flow and temperature variables are included. The course ends with an introduction to the principles of regulators and controllers.

47.409 Process Dynamics — Measurement transducers, interface devices, indicators and recorders. Controllers and control functions. Dynamics of process systems, lumped parametric solutions. Upset solutions. Computer applications of system modelling.

49.104 Drafting — Students learn techniques of reading and producing orthographic drawings using standard format, and develop basic skills in applying these techniques. Also included is the use of instruments, line work, geometric constructions, orthographic projection, isometric drawing and sketching, sections and dimensioning.

Faculty and Staff

I.M. Anderson, M.I., Gas.E., C.Eng., *Department Head*
S. Berghold
J. Berry, B.Sc., M.Sc., Ph.D.
W.J. Bogyo, B.C.L.Ass., Senior Instructor
J.T. Denley, B.Sc., P.Eng. (Alta.)
R. Drouin, Dipl.T.
W.R. Irvine, B.A., M.Sc., P.Eng., Chief Instructor
D.J. McLeod, A.R.M.T.C., A.I.M.
W.F. Roberts, B.A., B.A.Sc., P.Eng., Senior Instructor
G.A. Smook, B.S., P.Eng.
T. Voksepp, B.A.Sc., P.Eng.



Mining

Technologists have an important role to play in the mining industry in exploration, in mine development and operation and in mineral-processing plant design and operation. In B.C., technological expertise is particularly vital because of the high costs incurred in exploring and developing the rugged terrain. The B.C. coal industry is expanding and local mining activity generally has brightened in recent years. In other parts of Canada and throughout the world mining is flourishing, offering those with a sense of adventure a wide range of career opportunities.

Job Opportunities
Some graduates enter the industry as exploration assistants and are involved in mapping structure, logging drill core or performing field tests. Others obtain positions as engineering assistants and work in surveying, gathering samples or in production control in the mines. Additional opportunities are found in the mineral processing industry as technicians in test labs, assayers or junior operators. Following approximately five years experience, opportunities for advancement to supervisory posts are excellent. Applicants should bear in mind that a willingness to travel and work in remote areas will greatly enhance their employment prospects. This program is accredited by the Society of Engineering Technologists.

The Program
Courses include math, physics and chemistry, as well as geology, surveying, assaying, mining operations and mineral processing.

Prerequisites
Graduation from the Selected or Combined Studies Program with Algebra 12 or Math 12, Physics 11 and Chemistry 11. A medical exam and chest x-ray are important if applicants plan to work in or near a mine.

Math 12 is only acceptable if taken prior to 1978

Course of Studies

Year 1	Term 1	Clrm hrs/wk
30.101	Applied Chemical Principles	6
31.150	Technical Communication	3
32.150	Basic Technical Mathematics	5
33.101	General Physics	6
49.101	Drafting	2
50.101	Geology	3
50.102	Mining	2
51.110	Engineering Surveying	3
	Library and Research	5
		35

Year 1	Term 2	
30.201	Applied Chemical Principles	6
31.250	Technical Communication	3
32.250	Calculus	5
33.201	General Physics	3
49.201	Drafting	2
50.201	Geology	3
50.202	Mining	2
51.210	Engineering Surveying	3
	Library and Research	5
		32

Year 2	Term 3	
31.350	Advanced Technical Communication	2
32.350	Statistics I	5
33.304	Mining Geophysics	1½
41.305	Assaying	4
41.314	Mineral Processing	3½
42.501	Statics and Strength of Materials	3
50.301	Geology — Structural	3½
50.302	Mining — Operation and Equipment	4
51.310	Surveying	3
	Library and Research	5½
		35

Year 2	Term 4	
31.450	Advanced Technical Communication	2
32.450	Numerical Methods	5
41.405	Assaying	4
41.414	Mineral Processing	3½
42.502	Statics and Strength of Materials	3
42.503	Hydraulics	3
50.401	Geology—Mineral Deposits	3½
50.402	Mining—Operation and Equipment	4
51.410	Surveying	3
	Library and Research	4
		35

Subject Outlines

30.101 Applied Chemical Principles — Provides the necessary background for chemical calculations and analysis. Included are stoichiometry, atomic structure, bonding, solution preparation and acid-base and oxidation-reduction reactions and titrations. Simple chemical equilibrium leads to a good working knowledge of pH, buffer solutions, solubility product, selective precipitation and industrial processes involving equilibria. Lab work consists of simple qualitative and quantitative analysis and good lab technique is taught.

30.201 Applied Chemical Principles — A continuation of 30.101 giving detailed coverage of gravimetric and columetric analysis and qualitative analysis of cations and iminos. Electrochemistry includes cells, electroplating and corrosion. Simple physical chemistry provides theory of solids, liquids and gases leading to fractional distillation and colligative properties. The Periodic Table is used to

correlate many properties of elements and compounds. Names and properties of some organic compounds are covered and lab work covers qualitative and quantitative analysis and physio-chemical separations. Throughout 30.101/201 attention is given to industrial and everyday applications.

31.150, 31.250 Technical Communication — In the one-hour lecture each week, students cover information on basic writing skills, technical correspondence, resumés and formal and informal reports. The weekly two-hour lab is used to apply the principles learned in the lecture. Students also practice oral communication skills and participate in a month-long reading and study skills course.

31.250 See 31.150

31.350, 31.450 Advanced Technical Communication — This course includes brief reviews of memoranda writing, oral reports and discussions, write-ups of field trips and lab reports. Note taking from oral reports or articles as used at conferences, abstract writing from technical articles, information retrieval and the technical roots of English are also integrated with the other courses in mining, geology and chemistry.

31.450 See 31.350

32.150 Basic Technical Mathematics — The application of methods of algebra, logarithms, geometry and trigonometry to technical problems in mining and engineering fields.

32.250 Calculus — Methods of differential and integral calculus and their application to mining and engineering problems. Topics include maxima, minima, curve sketching, related rates, areas, volumes and basic differential equations.

32.350 Statistics I — An introduction to statistics. Organization and presentation of data; measures of central tendency and dispersion; frequency distributions; sampling; estimation; hypothesis testing; linear regression and correlation.

32.450 Numerical Methods — An introduction to operations research techniques and the use of mathematics in decision-making. The course includes topics selected from linear programming, transportation, assignment, inventory models, queuing theory, and decision-making under uncertainty. To solve some of the problems illustrating these topics, use will be made of the computing facilities at BCIT and the course will include an introduction to computer programming.

33.101 General Physics — A general level course covering mechanics, dynamics, and the properties of solids and fluids.

33.201 General Physics — A general level course of lectures only covering thermal properties of matter, waves, electricity, magnetism, electromagnetism and atomic and nuclear physics.

33.304 Mining Geophysics — This course consists of field work on geophysical methods of mineral exploration and development.

41.305, 41.405 Assaying — Analytical chemistry applied to the ore minerals, with special attention to fire assaying for gold and silver. Gravimitsic, volumetric and instrumental methods are developed for the more common metals. Students are encouraged to attempt the examinations for the provincial government licence to practise assaying in B.C. after at least one year's experience following graduation.

41.314, 41.414 Mineral Processing — The essential unit operations applied to mineral processing techniques for mining students. Crushing, grinding, gravity separation, flotation, cyclone classification, materials handling and storage, statistics applied to sampling problems. An introduction to chemical and bacterial leaching as applied to precious metals and nonferrous ores. The course emphasizes the numerical solution of operating-type problems.

41.405 See 41.305

41.414 See 41.314

42.501 Statics and Strength of Materials — Starting with vector representation of force systems, the student learns to analyze a large variety of equilibrium problems by both graphical and analytical methods. After thorough grounding in force analysis the student examines the stresses produced by these forces in various materials and under typical engineering conditions.

42.502 Statics and Strength of Materials — Simple stresses; stress, strain elasticity; compound bars and columns; temperature stress; elastic limit; limit of proportionality; yield; ultimate; factor of safety; load factor; ductility; resilience; fatigue; shock. Properties of sections; bending moments; shear forces; theory of flexure; deflection of beams; eccentric loading; lateral loading; compound stress and strain; Poisson's ratio; principal stress and strains; Mohr's circle; testing techniques; machines; extensometers; strain gauges; photo elasticity. Special sessions on rock mechanics, earth pressures and slope stability.

42.503 Hydraulics — Hydrostatics, properties of fluids, pressure, centre of pressure; flow of fluids, equation of continuity, velocity head, venturi, jets; orifices; notch and weir, friction and pipe flow; Reynolds' experiments, water hammer; flow laminar and turbulent; open-channel flow, regular channels, hydraulic jump, irregular channels; meters, valves, pumps. Lab experiments form a part of this course.

49.101 Drafting — Techniques of reading and producting orthographic drawings using standard format and the development of basic skills in applying these techniques. Use of instruments, line work, geometric constructions, orthographic projection, isometric drawing and sketching, sections and dimensioning.

49.201 Drafting — Involves techniques in ink, contours, intersection and developments, dip, strike and outcrop, sections, profiles, descriptive geometry and other graphical mining problems. Prerequisite: Drafting Fundamentals (49.101).

50.101, 50.201 Geology — Definition, basic concepts, earth's crust, geologic time; atomic structure of minerals, crystal forms and symmetry systems; properties of common minerals, sedimentary rock types, clastic and chemical sedimentaries; igneous rock types, classification; deformation of earth's crust, folds, faults; metamorphic rocks; weathering, erosion and glaciation; economic geology, mineral fuels, non-metallics, ore deposits and their controls; geological history, pre-Cambrian, Paleozoic, Mesozoic, Tertiary, Pleistocene; geologic maps.

50.102, 50.202 Mining — Nature of mineral industries, brief history, classification, search for economic mineral deposits, prospecting techniques; preliminary exploration methods; terminology; evaluation; production and treatment methods; recoverable unit value, smelter contracts, evaluation, sampling methods, weighted arithmetic mean, determination of average grade, ore reserves; the "Mineral Act"; exploitation of mineral deposits, planned systems of extraction and classification of mining methods. In addition an introduction to some unit operations in mining, e.g. drilling and haulage.

50.201 See 50.101

50.202 See 50.102

50.301 Geology—Structural — Brief review of mechanical principles of rock deformation and of the primary structures of sedimentary, igneous and metamorphic rocks. The origin, nature and classification of joints, folds and faults, with emphasis on their relation to mineral resources. Lab work includes examinations of specimens, methods of recording structural data, mapping and solution of structural problems, with emphasis on economic aspects.

50.302, 50.402 Mining—Operation and Equipment — Mining economics; cost components; selection and utilization of equipment; break-even ratio; breaking ground; ground support; ore-and waste-removal; development drives; examples of mining practice; control of water, drainage, grouting; ventilation; occupational hazards; "Mines Regulation Act", mine organization, lab sessions; field trips to mines and suppliers of mining equipment for familiarization with mining methods, systems and equipment. Sessions are also given on power generation and distribution and electrical equipment for mine service, pumping, ventilation, V-belt drives, dust and noise control, hoisting and compressed-air practice.

Certificate in mine-rescue work can usually be obtained.

50.401 Geology—Mineral Deposits — The terminology, classification, manner of occurrence, distribution and economics of mineral resources, with emphasis on typical Canadian occurrences. Ways of recognizing, discovering, and developing mineral deposits. Lab work illustrates and develops techniques in megascopic study and identification of hand specimens; valuation of mineral deposits. Field trips are correlated with all classroom work in geology.

50.402 See 50.302

51.110, 51.210 Engineering Surveying — Fundamental concepts of surveying; measurement of distances, use of compasses, theodolites, plane tables, levels and chains, site surveys. Calculations relating to traverses, triangulations, areas and volumes: obtaining, recording, and plotting topographic detail. Care, maintenance and adjustment of equipment.

51.210 See 51.110

51.310, 51.410 Surveying — Application of survey methods to underground surveying; illumination of stations; use of mining transits, connecting surface and underground surveys, location and control of tunnels, construction of plans and sections related to mining, elementary astronomy, elementary photogrammetry applied to mining, stope surveys and quantity calculations. Mining acts related to surveying.

51.410 See 51.310

Faculty and Staff

I.M. Anderson, M.I.GasE., C.Eng.,
Department Head (Acting)
J.F. Fairley, B.A.Sc., P.Eng.
D.J. Hardie, H.N.C.

Natural Gas and Petroleum

Because of its size and diversity, the petroleum industry is unique, both in its extremely wide range of occupational opportunities, and in the many challenges it offers employees for learning and growing.

Job Opportunities

The petroleum industry can be considered under four general areas: Exploration and Production, Transmission and Distribution, Manufacturing (refining) and Marketing. There are a great variety of positions to be filled by Natural Gas and Petroleum Technology graduates in each of these areas. Past graduates are successfully employed in all these areas, both in Canada and throughout the world. Positions available include:

Exploration and Production: geologic studies, reservoir studies, well testing and serving.

Transmission and Distribution: operation and maintenance of pipelines, utility studies and corrosion control.

Manufacturing: process operations, laboratory and product quality control, effluent control.

Marketing: product application for all of the petroleum products produced for commercial and industrial equipment.

The Program

The curriculum is designed to cover all major aspects of the petroleum industry, thereby enabling the graduate to successfully enter any area of the industry.

The first year covers the basic scientific and engineering principles required for the specialized training given in the second year. Thus, in the first year there is emphasis on chemistry, physics and mathematics, together with an introduction to petroleum geology and the behavior of petroleum hydrocarbons.

In the second year, the following areas are studied: Oil and Gas Production, Pipeline Construction and Operation, Gas Distribution and Utilization, Oil Refining and Utilization. There will be considerable emphasis placed on measurement and computerized process control.

Classroom and laboratory instruction will be supplemented by field trips to local installations.

This program is accredited by the Society of Engineering Technologists.

Prerequisites

Graduation from the Selected or Combined Studies Program with Algebra 12 or Math 12 and Physics 11 or Chemistry 11. Students should have a keen interest in the operation of large-scale equipment, be prepared to work outdoors and, with training, must be capable of assuming responsibility for the satisfactory and safe operation of highly complex plant equipment.

Math 12 is only acceptable if taken prior to 1978

Course of Studies

		Clrm hrs/wk
Year 1	**Term 1**	
30.101	Applied Chemical Principles	6
31.147	Technical Communication	3
32.147	Basic Technical Mathematics	5
33.101	General Physics	6
41.106	Engineering Materials	3½
47.101	Introduction to Petroleum Hydrocarbons	3
50.101	Geology	3
	Library and Research	5½
		35
Year 1	**Term 2**	
22.247	Basic Operations Management	2
30.201	Applied Chemical Principles	6
31.247	Technical Communication	3
32.247	Calculus I and II	5
33.201	General Physics	3
33.204	Introductory Geophysics	3
47.202	Petroleum Geology	3
49.266	Introduction to Machine Tools	2
51.208	Introduction to Surveying	3
	Library and Research	5
		35
Year 2	**Term 3**	
30.302	Physical Chemistry	5
32.347	Differential Equations	5
41.341	Unit Operations	6
41.351	Pollution Control	3
47.221	Gas Distribution and Utilization	6
47.311	Gas and Oil: Production and Transmission	6
	Library and Research	4
		35
Year 2	**Term 4**	
14.351	Computer Applications	2
30.404	Petroleum Chemistry	5
32.447	Numerical Methods and Statistics	5
33.406	Petroleum Geophysics	1
41.441	Unit Operations	6
47.409	Process Dynamics	3
47.431	Oil Refining and Utilization	8
	Library and Research	5
		35

Subject Outlines

14.351 Computer Applications — Applications of the computer; how a computer works; recognizing problems suitable for computer solution; flow-charting and communicating with computer personnel. Emphasis is on the use of computers to solve problems related to the technology. Where available, "package" programs will be demonstrated and used by students.

22.247 Basic Operations Management — Management problem-solving and work simplification with particular application

to the natural gas and petroleum industry. Includes method study, some measurement techniques, plant layout, planning and scheduling.

30.101 Applied Chemical Principles — Provides the necessary background for chemical calculations and analysis. Included are stoichiometry, atomic structure, bonding, solution preparation and acid-base and oxidation-reduction reactions and titrations. Simple chemical equilibrium leads to a good working knowledge of pH, buffer solutions, solubility product, selective precipitation and industrial processes involving equilibria. Lab work consists of simple qualitative and quantitative analysis and good lab technique is taught.

30.201 Applied Chemical Principles — A continuation of 30.101 giving detailed coverage of gravimetric and columetric analysis and qualitative analysis of cations and iminos. Electrochemistry includes cells, electroplating and corrosion. Simple physical chemistry provides theory of solids, liquids and gases leading to fractional distillation and colligative properties. The Periodic Table is used to correlate many properties of elements and compounds. Names and properties of some organic compounds are covered and lab work covers qualitative and quantitative analysis and physio-chemical separations. Throughout 30.101/201 attention is given to industrial and everyday applications.

30.302 Physical Chemistry — This course presents the kinetic theory of gases, the first and second laws of thermodynamics, phase equilibria, chemical kinetics and catalysis. Lab work consolidates lecture material and gives experience in practical physical chemical measurements.

30.404 Petroleum Chemistry — This course presents a survey of the properties and common reactions of the classes of organic compounds which are found in petroleum or are of importance in the petrochemical industry. The chemistry of refining processes, instrumental lab analysis and synthesis of some petrochemicals are presented.

31.147, 31.247 Technical Communication — This is an applied industrial communication course that concentrates on the techniques and applications of written and spoken communication. The discussion topics, explanations, illustrations and assignments are related as closely as possible to the vocational futures of natural gas and petroleum students. The intent of this course is to prepare students with the skills necessary for on-the-job communication.

31.247 See 31.147

32.147 Basic Technical Mathematics — Topics in algebra, logarithms and trigonometry, with emphasis on technological applications and problem solving.

32.247 Calculus I and II — Conic sections; differential calculus with ordinary and partial derivatives; integral calculus; applications from gas and oil technology.

32.347 Differential Equations — Differential equations, their analytic and numerical solutions.

32.447 Numerical Methods and Statistics — Topics in numerical methods. Computer solutions are introduced for the solution of polynomial equations, quadrature problems and some linear programming problems. An introduction to statistics is also included. Descriptive statistics, estimation, hypothesis testing and some non-parametric methods.

33.101 General Physics — A general level course covering mechanics, dynamics and the properties of solids and fluids.

33.201 General Physics — A general level course of lectures only covering thermal properties of matter, waves, electricity, magnetism, electromagnetism and atomic and nuclear physics.

33.204 Introductory Geophysics — A combined lecture and laboratory course covering the elements of gravity, resistivity, seismic and magnetic methods of geophysical surveying as prerequisite for Petroleum Geophysics. (33.406).

33.406 Petroleum Geophysics — This course consists of lectures on geophysical methods used in the exploration for natural gas and petroleum. Emphasis is placed on seismic methods and well logging techniques.

41.106 Engineering Materials — Comparative properties of all classes of engineering materials, including metals, alloys, polymers, concrete, wood and ceramics. Common causes of failure in service including fatigue, weathering, embrittlement and corrosion.

41.341, 41.441 Unit Operations — First and second law of thermodynamics; enthalpy, entropy, phase rule, thermodynamic diagrams and tables; fluid flow and measurement in pipes and channels, piping, pipe fittings and valves; solid handling, grinding, crushing, screening, mixing, settling, sedimentation, filtration, floatation; flow of heat, conduction, convection, radiation, film and over-all transfer coefficients, heat exchangers; principles and application of equipment for evaporation, distillation, absorption, extraction; humidification and dehumidification; drying, crystallization; ion exchange.

41.351 Pollution Control — Fundamentals of waste treatment and management systems. Basic sampling and testing techniques.

41.441 See 41.341

47.101 Introduction to Petroleum Hydrocarbons — This course introduces students to the chemical composition and physical properties of natural gas and crude oil, the phase behavior of these fluids at high pressures in a reservoir and their handling and treatment when recovered from the reservoir before entering the transmission line.

47.202 Petroleum Geology — Origin of petroleum; historic and structural geology of reservoirs; well logging; construction of isopach and isochore subsurface maps; porosity and permiability of rocks; petroleum geology of Western Canada.

47.221 Gas Distribution and Utilization — City gate stations; regulation and odorization; high, medium and low pressure distribution systems; network analysis; services; service regulators; meters; combustion stoichiometry; furnaces, boilers; installation codes; industrial and power utilization; corrosion control; peak shaving; storage.

47.311 Gas and Oil: Production and Transmission — Hydrocarbon reservoirs; exploration; well drilling; field production and treatment; conservation; gathering and transmission systems; pipeline construction and maintenance; corrosion protection; compressor and pumping stations; flow computations; economics of design; measurement; laws and regulations.

47.409 Process Dynamics — Measurement transducers; interface devices; indicators and recorders; controllers and control functions; dynamics of process systems; lumped parametric solutions; upset solutions: computer applications of system modelling.

47.431 Oil Refining and Utilization — Petroleum refining is a very complex operation due mainly to the multitude of products that are made. Each product has its own individual requirements depending upon the use to which it is to be put. Lecture periods cover the refining processes involved in producing the various petroleum products. These processes include distillation, cracking, reforming, hydro-heating, lube oil refining, etc. For each type of petroleum product, the desirable properties, specifications and equipment in which the product is used are examined. Laboratory periods cover the testing of various products obtained from a typical crude oil. Supplementing these studies are field trips to local refineries, to acquaint students with actual equipment and to meet people in the industry.

49.266 Introduction to Machine Tools — A basic course designed to familiarize the student with shop tools and equipment and with shop terminology and established standards of workmanship. Demonstrations are carried out to provide a practical understanding of the subject.

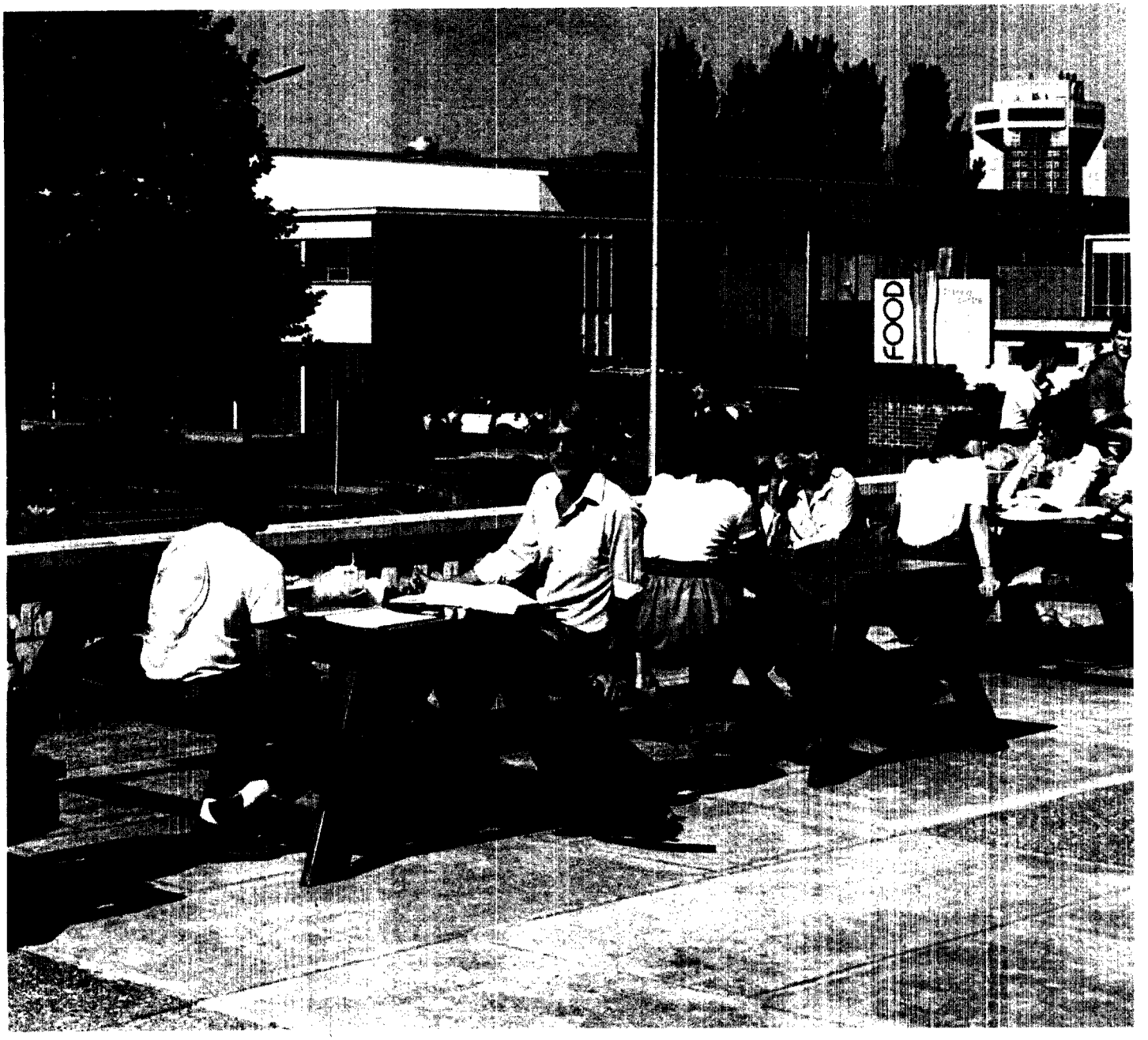
50.101 Geology — Definition, basic concepts, earth's crust, geologic time; atomic structure of minerals, crystal forms and symmetry systems; properties of common minerals, sedimentary rock types, clastic and chemical sedimentaries; igneous rock types, classification; deformation of earth's crust, folds, faults;

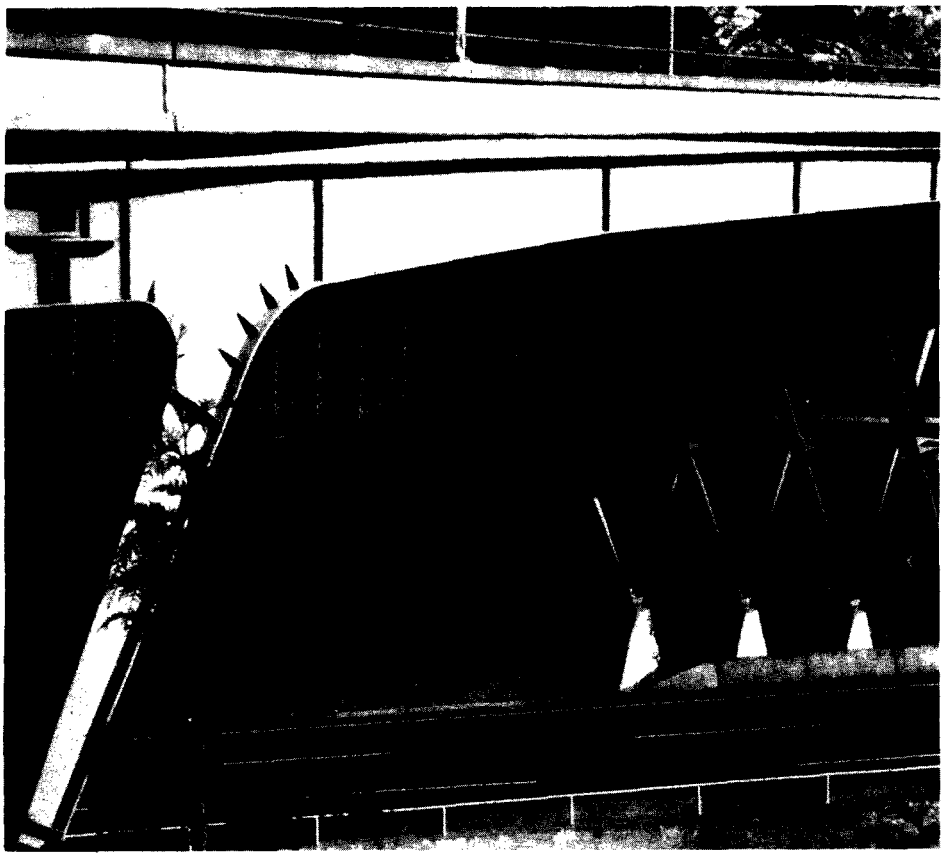
metamorphic rocks; weathering, erosion and glaciation; economic geology, mineral fuels, non-metallics, ore deposits and their controls; geological history, pre-Cambrian, Paleozoic, Mesozoic, Tertiary, Pleistocene; geologic maps.

51.208 Introduction to Surveying — Introduction to the theory of engineering survey; practical application of linear measurements; introduction to and theory of the theodolite; bearings and traverse computations; introduction to and theory of levelling; computation of areas and volume.

Faculty and Staff

I.M. Anderson, M.I. Gas E., C.Eng., *Department Head*
D.A. Campbell, B.A., (Hons.), M.Ed.
R.G. Kinney, Dipl.T., C.E.T.





Civil and Structural

Civil and structural technologists are involved in the design and construction of highways, bridges, airports, railways, municipal works, power developments, dams, canals, docks and harbors. The field has enormous creative potential and offers the technologist involvement in all phases of a project, from the design stage to finished job.

Job Opportunities
Graduates find employment as inspectors, construction supervisors, testing lab technicians, design detailers and investigation and construction technologists in government and in private industry. A number of graduates have founded their own consulting or construction businesses. Others are placed in engineering, contracting, surveying or architectural firms as project managers or supervisors, or to work in design or analysis. These jobs usually entail an equal amount of time spent outdoors as indoors. Fieldwork usually takes place from spring to fall.

The Program
The diverse and stimulating program includes field trips to assist students in developing their creativity, ingenuity and critical abilities, as well as major projects in which the student develops, in consultation with professionals, appropriate methods of approach and solution.

In the second year students may choose their course content to provide a degree of specialization in varying areas of the civil or structural technology. These include Geotechnical/Highways, Public Works, and Structures.

This program has been accredited at the technologist level by the Society of Engineering Technologists of B.C. and, upon completion of the BCIT diploma program, graduates are eligible for membership in the Society.

Prerequisites
Graduation from the Selected or Combined Studies Program with Algebra 12 or Math 12 and Physics 11. Applicants should be skilled in the use of the English language, have good mathematical ability and be interested in the physical sciences. Drawing or sketching ability is useful.

Preference will be given to students who have a C+ or better standing in the above subjects, or who have relevant work experience.

Exemption from the academic requirements may be made in the case of mature applicants with extensive applicable practical experience.

Math 12 is only acceptable if taken prior to 1978. An optional two week pre-entry course is available to assist those students who would like some orientation and upgrading prior to starting the Civil and Structural program.

Course of Studies

*Course continued in the following term(s)

Year 1	Term 1	Clrm hrs/wk
*31.142/242	Technical Communication	3
*32.142/242	Basic Technical Maths and Calculus	5
*33.107/207	Physics	5
Mandatory Technical Subjects		
42.001	Statics	6
42.002	Civil Technology I	3
42.007	Construction Materials I	3
	Library and Research	5
*49.101/202	Drafting	2
*51.109/209	Surveying	3
		35

Year 1	Terms 2A, 2B	2A	2B
31.142/242	Technical Communication	3	3
31.142/242	Basic Technical Maths and Calculus	5	5
33.107/207	Physics	5	5
Mandatory Technical Subjects			
42.003	Hydraulics I	3	3
42.004	Civil Technology II	3	
42.005	Elementary Structural Design		6
42.006	Strength of Materials	6	
42.122	Computer Applications		3
	Library and Research	5	5
49.101/202	Drafting	2	2
51.109/209	Surveying	3	3
		35	35

Year 2	Term 3	
*31.342/442	Technical Communications	2
*32.342/442	Matrices, Statistics and Numerical Methods	4
Technical Subjects (common to all options)		
*41.309/409	Surveying	3
42.056	Hydraulics 2	3
	Library and Research	5
		17

Year 2	Terms 4A, 4B	4A	4B
31.342/442	Technical Communications	2	2
32.342/442	Matrices, Statistics and Numerical Methods	4	4
Technical Subjects (common to all options)			
41.309/409	Surveying	3	3
42.030	Construction Planning		6
	Library and Research	5	5
42.064	Construction Materials 2		3
		14	23

There are several possible options in the second year. These are: 1) Geotechnical/ Highways, 2) Public Works, 3) Structures. Each of these options enables the student to work in that particular field although much of the program is similar for all second year sets. The specific option courses are as follows:

Geotechnical/Highways

Year 2	Term 3	
42.044	Structural Design General	6
42.021	Soil Mechanics I	6
42.052	Municipal Services	6
		18

Year 2	Terms 4A, 4B	4A	4B
22.342	Work Study	3	
42.022	Soil Mechanics 2	6	
42.031	Construction Estimating	3	
42.051	Subdivision Planning and Street Design	6	
51.427	Air Photo Interpretation	3	
42.023	Soil Mechanics 3		6
42.061	Highway Design (Set A2)		6
41.062	Traffic Technology (Set B2)		3
50.410	Commercial Explosives (Set B2)		3
		21	12

Public Works

Year 2	Term 3	
42.024	Soil Mechanics 1A	3
42.044	Structural Design General	6
42.052	Municipal Services	6
42.063	Transportation	3
		18

Year 2	Terms 4A, 4B	4A	4B
22.342	Work Study (Op. Man. 1)	3	
42.025	Soil Mechanics 1B/24	6	
42.032	Construction Detailing (Set D2)	3	
42.051	Subdivision Planning & Street Design	6	
42.055	Environmental Management (Set C2)	3	
42.026	Soil Mechanics 2B		3
42.031	Construction Estimating		3
42.061	Highway Design		6
42.054	Water Resources (Set C2)		3
50.410	Commercial Explosives (Set D2)		3
		21	12

Structural

Year 2	Term 3	
42.024	Soil Mechanics 1A	3
42.041	Structures I	6
42.057	Street Design	3
42.065	Highways Design & Structures	6
		18

Year 2	Terms 4A, 4B	4A	4B
22.342	Work Study (Op Man. I)	3	
42.025	Soil Mechanics 1B/2A	6	
42.042	Structures 2	6	
42.053	Municipal Services General	6	
42.031	Construction Estimating		3
42.043	Structures 3		6
42.047	Structural Detailing		3
		21	12

Subject Outlines

22.342 Operations Management I — The study of problem solving in industry, with particular emphasis on heavy construction and manufacturing problems. The course includes method study, process charting, activity-sampling, work measurement, motion economy and productivity. Special emphasis is placed on the human problems associated with change. The course is particularly slanted towards civil engineering.

22.442 Operations Management 2 — Planning, scheduling, job loading and levelling, plant layout and critical path network diagrams are considered and used in industry-type projects. The course is completed when the student submits a term project which encompasses much of the material studied in class. The projects are designed to meet the needs of the civil engineering student.

31.142, 31.242 Technical Communication — In one lecture each week, students receive information on basic writing skills, technical correspondence and related technical writing tasks, videotaping and other audiovisual techniques, oral presentations and informal and formal reports. The two labs per week are devoted to practicing writing and speaking skills. Students are expected to complete approximately ten assignments per term. The shorter assignments are done in the labs, while the longer assignments—reports, oral presentations and video-taping projects—require additional work out of class. Students also take a month-long reading and study skills course during the first or second term.

31.242 See 31.142

31.342, 31.442 Technical Communication — In two hours of lab sessions per week, students practice writing, under supervision, typical kinds of engineering communications such as letters, memos, reports, specifications and proposals. Some assignments are done jointly with various civil and structural engineering courses. The equivalent of one short writing assignment per week is required.

31.442 See 31.342

32.142 Basic Technical Mathematics — Topics in algebra, logarithms, trigonometry and analytic geometry.

32.242 Calculus — An introductory course in calculus dealing with the differentiation and integration of algebraic expressions and some trigonometric, logarithmic and exponential functions. Additional topics associated with these include conics and calculus problems, and partial differentiation.

32.342 Matrix Methods — An introduction to matrix algebra; basic operations; determinants; solution of simultaneous equations; eigenvalue problems. Applications of matrix algebra to technological problems.

32.442 Statistics and Numerical Methods — An introduction to statistics. Organization and presentation of data; measures of central tendency and dispersion; frequency distributions; sampling; estimation; hypothesis testing. An introduction to operations research techniques and the uses of mathematics in business decision-making. Linear programming; transportation; assignment; inventory models.

33.107, 33.207 Physics — This is a general level physics course emphasizing the application of physical principles in the Civil and Structural Technology. A section on the application of geophysical exploration techniques used in the technology is included. Topics covered include statics, kinematics, dynamics, energy and power, angular motion, thermal properties of matter, fluid mechanics, wave motion and waves in elastic media, basic electricity and magnetism and instrumentation, optics and atomic and nuclear phenomena. The lab program stresses measurements, data analysis and experimental techniques.

33.207 See 33.107

42.001 Statics — Vectors, force systems, graphical analysis, resultants, components, moments, equilibrium laws, force polygons, funicular polygons, frames and trusses, stress diagrams, Bowes' notation, flexible tension members, load shear and bending moment curves. Closely supervised problem sessions are used to provide the student with practice in common analytical and graphical solutions to problems of static load on statically determinate structures.

42.002 Civil Technology 1 — Introduction to basic procedures, terminology and technical skills associated with the civil industry. Basic procedures include use of scales, planimeter and topographic plan for determining data necessary for earthwork cross-sections and drainage analysis; preparation of working drawings, a design brief, a bill of quantities; and referencing standards. Technical skills include preparation of a design profile and a construction cost estimate; computation of end areas from earthwork cross-sections and of earthwork volumes; and use of rational equation to size a culvert.

These skills and procedures are applied to the realignment of a section of road. Throughout the course an engineering approach is adopted towards problem solving with emphasis on data collection and presentation rather than computation.

42.003 Hydraulics 1 — Through problem sessions and lectures, the student learns to determine the hydrostatic forces exerted by water on a variety of structures, gates, tanks and dams. As part of a project, the student analyzes a complex tank full of water to determine the forces and centres of pressure. Special problems on hydrostatic pressures produced in accelerated or rotated fluids are given. Further problem sessions lead to the understanding of energy transfers and losses in pipe systems and the significance of friction losses in waterworks systems. In this part of the course the student analyzes a simple pump-driven circulation system and graphs all energy gradients in profile along the system. Evaluation is by individual interview, problems and quizzes.

42.004 Civil Technology 2 — Further develops some of the technical theory associated with civil design as introduced in Civil Technology 1. With reference to the project used in Civil Technology 1, students are introduced to computation of vertical curves; simple circular curves; distribution of pressure through pavement structure; theory of super elevation; open channel flow; hydrographs; peak flow estimation and flood control. Problem sheets give practical applications of problem solving requiring extensive algebraic and trignometric computation.

42.005 Elementary Structural Design — Having previously studied forces and material properties, students learn to apply these to analysis of real structures. They also study the effects of wind, snow and earthquake loads as determined by national standards. Design and analysis of steel and timber beams, columns and trusses and their connections are used as examples.

42.006 Strength of Materials — Simple stresses; stress, strain, elasticity; compound bars and columns; temperature stress; elastic limit, limit of proportionality; yield; ultimate; factor of safety; load factor; ductility; resilience; fatigue; shock. Properties of sections; bending moments; shear forces; theory of flexure; slopes and deflection of beams; restrained and continuous beams. Strut theories; eccentric loading, lateral loading. Testing techniques; machines; extensometers; strain gauges; brittle lacquers; photo elasticity; evaluation of results.

42.007 Construction Materials I — Introduces the fundamentals of the construction materials, concrete, asphalt, and aggregates. Students learn to perform basic tests on these materials in accordance with established standards and recommended industry laboratory procedures. In addition, students learn to sample, inspect and test these materials under civil project conditions.

42.021, 42.022 Soil Mechanics 1 and 2 — Through lectures and lab work, the student becomes familiar with the basic elements of soil classification and soil behavior, learns to make standard lab tests and to present results in standard report form. Through application of soil mechanics principles and soil test data to a variety of geotechnical, foundations and drainage design problems, the student learns to relate the behavior of soil material to common engineering requirements and conditions. Topics include volume-weight relationships, soil classification, compaction, geology, subsurface investigation, permeability and pore pressure distribution, effective stress, consolidation, shear strength, seepage analysis, slope stability, earth pressures, retaining structures, foundations, triaxial testing, field sampling. Lab tests include Atterburg, sieve gradation, specific-gravity, moisture-density, field density, permeability, shear testing, unconfined compression, consolidation and triaxial testing. Projects include earth-fill dam analysis, earth pressure calculation on a retaining wall, design of a drainage system, design of a sheet pile bulkhead, redesign of structures after failure analysis and common foundation design problems.

42.022 See 42.021

42.023 Soil Mechanics 3 — Lectures, laboratory and project work and guest lectures, geotechnical aspects of tailing dam design, construction and maintenance; triaxial soil testing; maintenance and operation of laboratory/field electronic equipment; subsurface investigation techniques; elementary rock mechanics; permafrost and northern construction; reinforced earth; and grouts and grouting techniques.

42.024 See 42.021 and 42.022

42.025 See 42.021 and 42.022

42.026 See 42.021 and 42.022

42.030 Construction Planning — Introduction to the time-value of money and the application of sound economic principles to comparison of construction alternatives and acquisition and maintenance of equipment. A major construction project is analyzed by the student emphasizing critical path planning and the optimum use of resources. Planning for construction projects involving repetitive operations is demonstrated by worked examples. Construction industry guests lecture on current projects and the responsibility of the technologist.

42.031 Construction Estimating — The student is involved in construction estimate preparation both as an individual and as a member of a team. Lectures illustrate the procedures for taking off quantities; establishing productivity forecasts and unit costs; and accounting and job control methods.

42.032 Construction Detailing — Introduction to the practical aspects of taking-off, fabrication, and the placing and inspecting of reinforcing steel in concrete structures. Field trips to fabricating plants and construction sites augment classroom instruction.

42.041 Structures I — In general the course deals with elementary structural design through students' individual progress in projects, aided when necessary by lecture and discussion. Topics include moment distribution, continuous beams, non-sway frames, portal frames, one-way reinforced concrete slabs, column design and retaining wall design.

42.042 Structures 2 — The stiffness matrix method of structural analysis is studied and the student analyses structures using an interactive computer program. The formwork design project is a practical application of timber design using plywood, sawn timber, bracing, and timber fasteners. Other optional topics may include prestressed concrete, reinforced masonry, or additional timber design. Field trips and/or guest lecturers will relate to above course content.

42.043 Structures 3 — An existing bridge is chosen in consultation with the instructor, and the student designs, aligns and details an alternative crossing to the original. The student learns about layout, moving loads, influence lines, continuous girders, trusses, arches, deflections of spans, bridge deck floor systems, sway bracing, deck slabs, joint details, piers and abutments and piling.

42.044 Structural Design General — This course is designed for students taking Civil options. Through analysis and design projects, students are introduced to reinforced concrete as a structural material. The effects of continuity within structures are discussed in lectures, and connection details for all structural components in basic building materials are developed.

42.047 Structural Detailing — Students are required to design and detail connections and draw solutions to detailing problems taken from structures used in other related courses, i.e. timber, steel and reinforced concrete. Includes bill of materials and reinforcing bar lists.

42.051 Subdivision Planning and Street Design — Through this introduction to the physical layout of urbanization the student learns to systematically subdivide a piece of land in accordance with recommended standards using imagination and creativity; design a major street to recommended standards including geometrics, elevation tables, catch basin locations, and rotation of crown; and to design a minor street complete with intersection, curb returns and appropriate drainage.

The topic is viewed from the range of planner, engineer, developer, consumer, and resident and the knowledge could be used working for a developer, municipal planner or engineer, or a consulting engineer or contractor. This course offers the opportunity to make decisions and to actually design a civil works project. Briefs are produced and there is exposure to designing an office environment as well.

42.053 Municipal Services General — Through a subdivision servicing project, the student gains the experience of designing a minor street, a small storm sewer system, a small sanitary sewer system, including a pumping station and laying out waterworks distribution mains. This is all part of a subdivision plan laid out by the students and designed for an accessible piece of undeveloped land in the region. Design of municipal arterial streets and design of waterworks distribution systems (Bernoulli method) are discussed but not practised. Field trips to water and sewer pumping stations, a pressure reducing valve chamber, a municipal works yard and sewer cleaning operations are included.

42.054 Water Resources — Lectures and problem sessions present the analysis of surface runoff by the rational formula and unit hydrograph, mass curves for water supply storage, and flood routing and detention storage. The use of the computer in predicting water resources and quality (mathematics modelling) is covered.

42.055 Environmental Management — Lectures and field trips introduce the methods of waste water and solid waste treatment. Pollution control and the environmental impact of waste disposal are discussed and the students prepare project reports based on research and lecture material.

42.056 Hydraulics 2 — Assignments and lectures include distribution of flows in pipe networks, reservoir and elevation problems, waterhammer, thrust forces at points of flow direction changes, specific energy in open-channel flows, hydraulic element ratios in open-channel flows; and culvert flows.

42.057 Street Design This is as 42.051, minus the subdivision planning.

42.061 Highway Design — This course simulates the role of a design technologist as part of a highway design team. Student teams design a section of highway under minimal supervision. Following a conceptual design, spiralled curves are designed and suitably superelevated. A typical section is established and an initial vertical alignment drawn up on a working drawing. Students then input template; ground data, and superelevation files into the "SEPS" earthwork computer program and subsequently manipulate their files to obtain an earthwork balance. Culvert and ditches are then added and preliminary drawings prepared showing culvert peoples, horizontal alignment, vertical alignment, superelevation and mass-haul. Throughout the project, design decisions and computations are recorded in a design brief. A progress report is also prepared similar to that often required on a highway design project.

42.062 Traffic Technology — This course introduces basic traffic engineering concepts associated with large scale highway projects (as opposed to municipal applications) of a type that the B.C. Ministry of Highways would be engaged in. Topics include simple traffic flow theory; data collection techniques for volume and speed studies; traffic assignment; highway capacity; signs and markings; intersection layout; auxiliary lanes and channelization; access; design vehicles. Part of the course includes the layout of an intersection complete with all channelization, signs, and markings.

42.063 Transportation — An overview of the various aspects of transportation engineering including some traffic theory, comparison of alternative transportation modes and associated socio-economical issues. Elements of traffic theory are introduced including simple traffic flow theory; signallized intersection capacity analyses; signal timing; data collection techniques; shopping centre layout; and signs and marking. Student teams research some topical transportation issue and give an oral and audio visual presentation to the class. At the end of the course an extensive technical report is submitted.

42.065 Construction Materials II — Introduction to the design of portland cement and asphaltic concrete as materials. Students learn to design concrete to specified strength and perform marshall design on asphalt. The course also includes an introduction to cement chemistry and manufacturing, non-destructive testing and statistical analysis of concrete; the analysis and interpretation of marshall designs of asphalt. Inspection techniques of construction material in general and specific emphasis on inspection procedures, reporting and safety for civil engineering will be covered in this course. As per 42.061 with additional topics relevant to highway structures such as bridge abutments, multiplate culverts, etc.

42.122 Computer Applications — This course is designed to make students aware of the uses (and misuses) to which computers may be put in solving design and construction problems. Flow charting is practised through the logics of the computer and the industrial operation. A fundamental computer language is taught. Topics include history of computer development, commercial and scientific applications, logic systems development, flow charting and civil engineering applications, FORTRAN IV or alternatives, available programs, linear programming and CPM techniques on the computer.

49.101 Drafting — Techniques of reading and producing orthographic drawings using standard format, and the development of basic skills in applying these techniques. Use of instruments, line work, geometric constructions, orthographic projection, isometric drawing, sketching, sections and dimensioning.

49.202 Drafting — Intersections, developments, descriptive geometry, contours, sections, profiles, cut and fill problems. All treated generally on a project basis with civil and structural design procedures.

50.410 Blasting — Blasting theory, experiments, drilling, and safety are covered in this course. Theory covers fragmentation principles (explosive variables, material variables, and the loading geometry), explosive products and their properties, and field systems. Experiments are "hands on" field detonations and safety discussion is largely Workers' Compensation Board regulations.

51.109, 51.209 Surveying — Fundamental concepts of surveying: measurement of distances, use of compasses, theodolites, plane tables, levels and chains, site surveys. Calculations relating to traverses, triangulations, areas and volumes: obtaining, recording and plotting topographic detail. Care, maintenance and adjustment of equipment.

51.209 See 51.109

51.427 Aerial Photo Interpretation in Highway Planning — Covers the fundamentals of aerial photo interpretation, basic photo interpretation equipment, geologic and soil mapping, air photo interpretation for terrain evaluation, and engineering applications of aerial photo interpretation including site evaluation and route location. The fundamentals of photogrammetry and the applications of photogrammetric equipment to highway engineering are also covered.

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C.E. Wade, B.Sc., P.Eng.

Electrical/Electronics

Electrical energy, electronic systems, industrial automation and control, and telecommunications form the base of modern high technology. These disciplines and the related systems and equipment are essential to the factory, the industrial process, the office, the small business, the hospital and the home. Modern transportation could not function without electronic systems.

There is a need for persons trained in the principles and applications of electronic systems to take their places in the technical team. The positions held by these persons are found in design, development, production, installation, sales and maintenance. The positions may be in commercial companies, government agencies, or educational institutions. The technologist graduate of the Electronics group is the anchor of this team.

The Electrical/Electronics program is accredited by the Society of Engineering Technologists.

The Program

Five options are offered in the Technology: Control Electronics, Instrumentation, Power, Telecommunications, and Microelectronics (and Robotics Technology).

The first three levels of the technology program are common to all five options. Levels 4 and 5, for all five options, are practically oriented, being primarily related to the specific industrial practices.

Throughout the program, students spend a good portion of their time in laboratories and workshops carrying out practical, applied assignments.

The **Power Option** is concerned primarily with the generation, transmission, distribution, utilization and control of electrical energy. The concept of electrical power systems requires the study of digital techniques and microprocessors which monitor and control these systems.

The **Instrumentation Option** stresses the importance of applications of automation and control systems in one of the most rapidly expanding phases of technology today. Students become competent in subject areas such as hydraulics, pneumatics, thermodynamics, chemistry, electronics, mini- and microprocessors, and software as they apply to measurement and control of real processes.

The **Telecommunications Option** emphasizes the application of electronics in the telecommunications industry, from simple broadcast and mobile transceivers to large density microwave radio systems, as well as electronic navigational systems and the use of new generation computers.

The **Control Electronics Option,** which could be called the Computer Control Option, presents a broad-based electronics program of study designed to provide the student with the background necessary for entry into a wide variety of areas in the electronics career field. Emphasis is on digital electronics, industrial electronics and digital computers, since the techniques involved are common to all modern electronic systems.

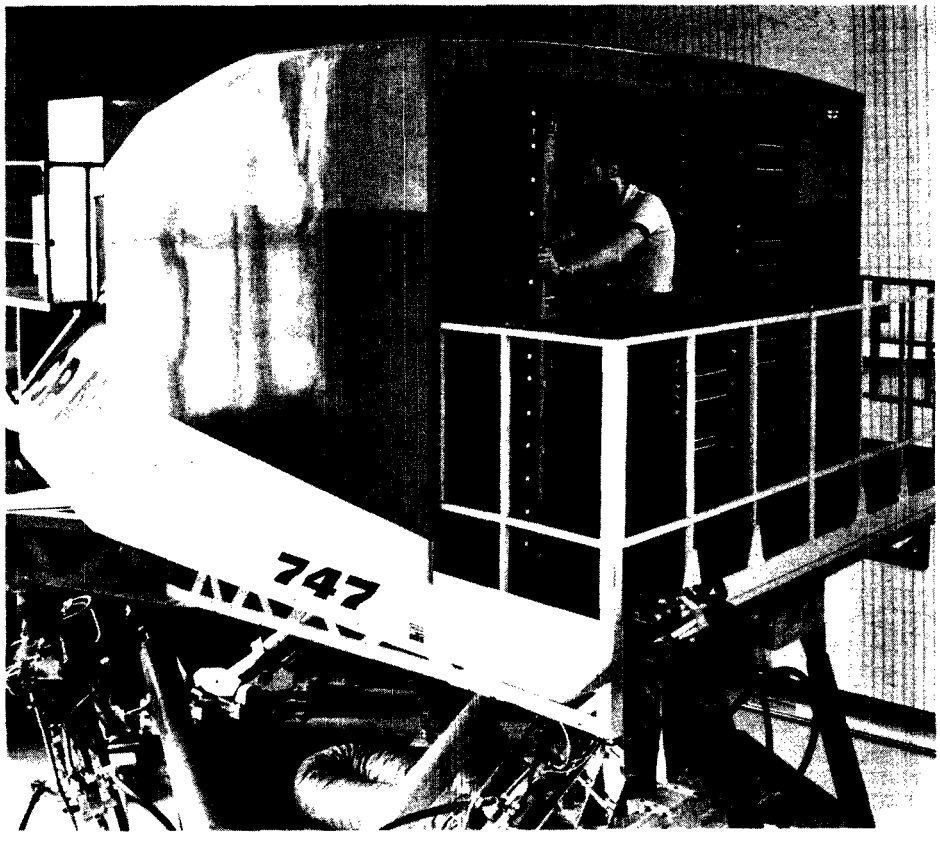
Microelectronics Option (proposed for September 1984). High technology in the next five years will place a great deal of emphasis on miniaturizing electronic circuits. This option will stress Very Large Scale Integration (VLSI), LSI, design and prototyping using the latest computer assisted techniques.

Robotics Technology (proposed for September 1984). This 5-semester technology will provide the student with competency in the applications, programming, installation and maintenance of robots and associated equipment. Emphasis will be on artificial intelligence, microprocessors, programming and CAD/CAM.

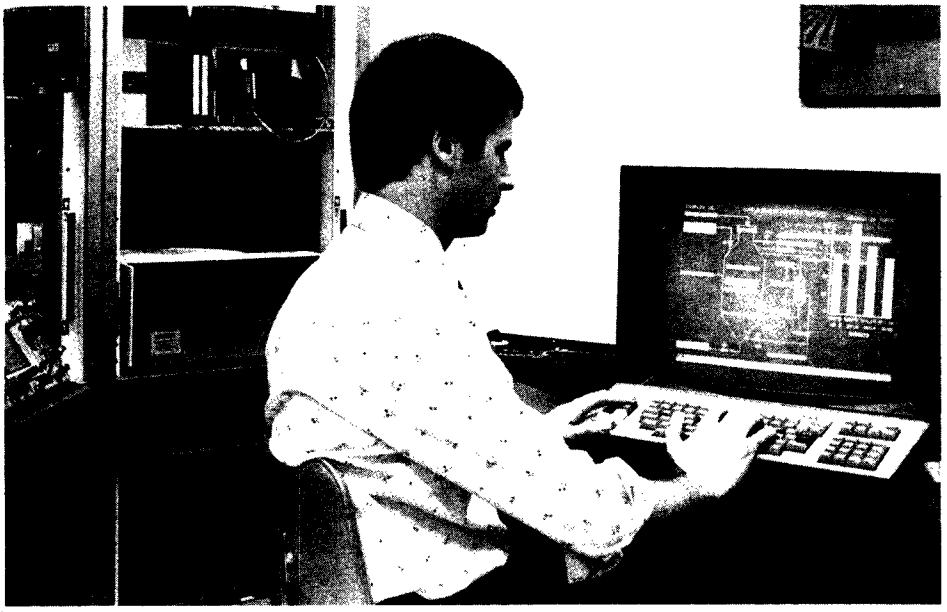
At the time of printing full individual course details were not available and are therefore not included in this presentation. However, the course of studies for the program choices are as outlined below.

Prerequisites

Graduation from High School with

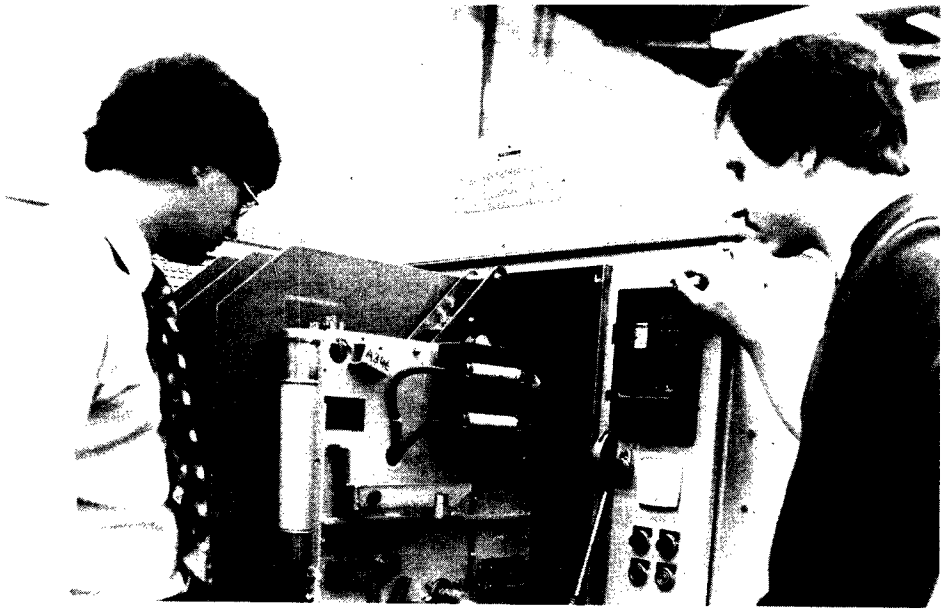


The **Control Electronics Option** presents a broad-based electronics course of study designed to provide the student with the background necessary for entry into a wide variety of areas in the electronics career field. Some emphasis is placed upon digital electronics, industrial electronics and digital computers, since the techniques involved are common to all modern electronics systems. Rapport with local industry is stressed through the medium of a two-week industrial practicum and selected guest lecturers.

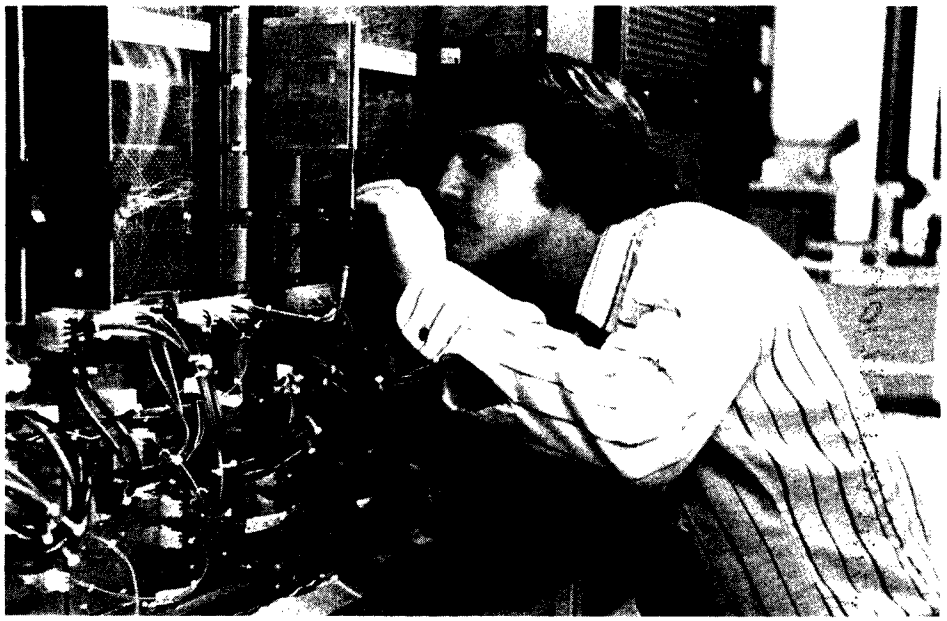


Students in the **Instrumentation Option** will be concerned with the applications of automation and control systems in one of the most rapidly expanding phases of technology today. They will be taught the fundamentals of automatic control systems which measure, compute and regulate process conditions such as level, pressure, flow, temperature and chemical composition. The graduate will be competent in subject areas such as hydraulics, pneumatics, thermodynamics, chemistry, electronics, mini and microprocessors and software as they apply to measurement and control of real processes.

The program will be applications-oriented with "hands-on" equipment labs, industrial tours, guest lecturers, design projects and a two-week industrial practicum.



The **Power Option** is concerned primarily with the generation, distribution, transmission, utilization and control of electrical energy. The concept of electrical power systems requires the study of digital techniques and microprocessors, which monitor and control these systems. Approximately 25 per cent of the total time in this option is devoted to electronically-oriented material.



The **Telecommunications Option** emphasizes the application of electronics in the telecommunications industry, from simple broadcast and mobile transceivers to large density microwave radio systems, as well as electronic navigational systems and the use of new-generation computers. Much emphasis is placed on the practical aspects of all courses; consequently, a good portion of the student's time is spent carrying out practical assignments.

Algebra 12 (or Math 12 if taken prior to 1978), Physics 11 and Chemistry 11, all with a C+ or better standing.

Course of Studies

Level 1	Clrm hrs/wk
Technical Communications 1	3
Mathematics	7
Physics 1	6
Programming	3
Circuit Analysis 1	6
Shop Practice	5
Library and Research	5
	35
Level 2	
Calculus	7
Physics 2	5
Digital Techniques 1	3
Circuit Analysis 2	5
Electronics Circuits 1	6
Printed Circuit Board Fabrication	4
Library and Research	5
	35
Level 3	
Electronic Circuits 2	5
Pulse Techniques	5
Digital Techniques 2	5
Transducers	5
Telecommunications 1	5
Electrical Equipment 1	5
Library and Research	5
	35

Telecommunications

Level 4	
Technical Communications 2	3
Mathematics	4
Digital Systems	6
Data Communications 1	6
Antennas and Transmission Lines	5
Telecommunications 2	6
Library and Research	5
	35
Level 5	
Technical Communications 3	3
Computer Systems	6
Communication Networks	5
Telecommunications 3	5
RF Circuit Design	6
Microwave Principles	5
Library and Research	5
	35

Control Electronics

Level 4	Clrm hrs/wk
Technical Communications 2	3
Mathematics	4
Digital Systems	6
Data Communications 1	6
Industrial Electronics	5
Feedback 1	6
Library and Research	5
	35
Level 5	
Technical Communications 3	3
Computer Systems	6
Feedback and Robotics	6
Data Communications 2	6
Programming Language	3
Video Graphics	6
Library and Research	5
	35

Instrumentation

Level 4	
Technical Communications 2	3
Unit Operations	4
Real Time Programming	5
Interface Electronics	5
Process Measurements	6
Process Control	7
Library and Research	5
	35
Level 5	
Technical Communications 3	3
Industrial Processes	4
Process Computer Systems	5
Digital Controllers	6
Analytic Process Measurements	6
Instrumentation Engineering	6
Library and Research	5
	35

Power

Level 4	
Technical Communications	3
Mathematics	4
Digital Systems	6
Industrial Electronics	5
Power Systems 1	6
Electrical Equipment 2	6
Library and Research	5
	35
Level 5	hrs/wk
Technical Communications 3	3
Feedback 1	6
Power Systems 2	9
Systems Design	4
Industrial Systems	8
Library and Research	5
	35

Microelectronics

To be announced

Robotics

To be announced

Faculty and Staff

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Forest Resource

British Columbia's greatest renewable natural resource is its forest land. The benefits that derive from the intelligently planned use of this forest land are certainly many, varied and extremely valuable to the people of this province.

The wise use of the land and related resources is essential for the continued survival of many industries, as well as for the perpetuation of the resources themselves.

The Forest Resource Technology has been established in an endeavor to meet the above needs and offers training in two options: **Forestry** and **Fish, Wildlife and Recreation**.

Job Opportunities

Graduates in the Forestry Option find employment in a variety of industrial and government positions.

The job opportunities for graduates in Fish, Wildlife and Recreation are principally in government agencies and, because of the limited number of jobs, the number of students is restricted.

The Program

Forestry covers forest engineering, logging systems and production, fire control, forest management, forest measurements, silviculture, photo interpretation and mapping, botany and soils, forest utilization and ecology.

Fish, Wildlife and Recreation covers the management of fish, wildlife, and recreation land and includes habitat ecology, environmental inventory techniques and law enforcement with respect to the above-mentioned resources.

Prerequisites

Graduation from the secondary school Combined or Selected Studies Program is a general prerequisite. Industrial experience strengthens an application for either of the options. Skill in report writing is highly desirable, and initiative, efficiency and leadership abilities are important qualities.

The following special prerequisites are required:

Algebra 11 with a C+ or better and a science 11 (Biology required for fish, wildlife and recreation, and preferred for forestry) and a science 12 (Algebra, Geometry, Probability and Statistics, Computer Science, Physics) with a C, or Physics 11 with a C+.

Expenses

In addition to tuition fees, books, supplies and equipment, students will incur expenses for field trips and a first-aid course. These expenses may be as much as $300 for first year and $400 for second year.

Course of Studies

Year 1	Term 1	Clrm hrs/wk Forestry	F.W.R.
31.145	Technical Communication	3	5
32.145	Mathematics for Forestry I	5	—
32.154	Mathematics for F.W.R. I	—	5
45.102	Forest Measurements I	5	5
45.103	Wood Utilization	3	—
45.104	Natural Resources I	6	6
45.106	Photo Interpretation and Mapping	4	4
45.108	Introduction to Fish, Wildlife and Recreation	—	3
45.110	Fire Management 1	3	—
45.121	Introduction to Micro Computers	2	2
	Library and Research	4	5
		35	35

Year 1	Term 2	Forestry	F.W.R.
31.245	Technical Communication	3	—
31.248	Technical Communication	—	3
32.245	Mathematics for Forestry II	6	—
32.254	Mathematics for F.W.R. II	—	6
44.224	Zoology	—	5
45.202	Forest Measurements II	8	—
45.203	Micro Computer Applications	—	3
45.204	Natural Resources II	5	5
45.206	Photo Interpretation and Mapping	4	4
45.210	Fire Management	2	—
45.220	Soils		
	Library and Research	3	5
		35	35

Year 2	Term 3	Forestry	F.W.R.
10.045	Human Resource Management	3	3
31.345	Advanced Technical Communication	2	2
45.302	Forest Measurements III	6	—
45.305	Timber Harvesting	5	—
45.308	Roads and Transportation I	6	—
45.313	Forest Pestology I	4	—
45.317	Silviculture I	4	—
45.321	Recreational Land Management I	—	5
45.322	Wildlife Management I	—	5
45.323	Fish Management I	—	6
45.327	Projects	—	6

Year 2	Term 3 cont.	Forestry	Clrm hrs/wk F.W.R.
45.328	Summer Technical Report	1	1
45.329	Environmental Inventory Techniques I	—	5
	Library and Research	4	2
		35	35

Year 2	Term 4	Forestry	F.W.R.
31.445	Technical Communication	2	—
45.402	Forest Measurements IV	6	—
45.405	Log Production and Cost Control	4	—
45.408	Roads and Transportation II	5	—
45.413	Forest Pestology II	4	—
45.416	Forest Management	4	—
45.417	Silviculture	5	—
45.421	Recreational Land Management II	—	6
45.422	Wildlife Management II	—	6
45.423	Fish Management II	—	6
45.427	Projects	—	5
45.429	Environmental Inventory Techniques II	—	4
45.430	Law Enforcement	—	2
	Library and Research	5	6
		35	35

Subject Outlines

10.045 Human Resource Management — An introduction to the major personnel and industrial relations programs applicable to the British Columbia workplace with emphasis on the value of the worker and the overall effectiveness of modern human resource management. It develops understanding of the skills required for selection interviews, performance appraisals, compensation reviews, labour contract negotiations, training and development programs, grievance and collective agreement administration and it reviews relevant employment law.

31.145, 31.245 Technical Communication — Writing basics are reviewed and an introduction to technical writing is presented. A lecture each week is followed by two lab sessions where various writing tasks are undertaken, under supervision. Some feedback for students occurs directly in lab periods and some takes place via written comments on assignments handed in. Every student is expected to make an oral presentation to his or her peers. Also included in the course are units of study concerning reading and study skills and job application strategies.

31.245 See 31.145

31.248 Technical Communication — A continuation of 31.145, covering job-finding techniques; letters and memos; long, formal reports. The course is presented through one lecture and two labs per week.

31.345 Advanced Technical Communication — This course covers reports, proposals, briefs, funding requests and other more complicated or sophisticated communication skills required on the job. Two hours of lab each week.

31.445 Technical Communication — Public speaking: oral communication techniques, graphics and audiovisual techniques, answering questions. **Media communication**: interview techniques, press releases, using radios and telephones. **Information packages**: organizing tours and training sessions, designing brochures and public announcements. Two labs per week.

32.145, 32.154 Mathematics for Forestry I — Topics in algebra, trigonometry, logarithms, analytical geometry and vectors, with emphasis on application to the forest industry.

32.154 See 32.145

32.245, 32.254 Mathematics for Forestry II — An introductory course in statistics. Organization and presentation of data; measures of central tendency and dispersion; frequency distributions; probability distributions; sampling; estimation; hypothesis testing; regression and correlation theory. Special emphasis on application of principles to the forest industry.

32.254 See 32.245

44.224 Zoology — General classification of the animal kingdom. Basic vertebrate zoology. The development of the vertebrate from embryo to adult. The study of the vertebrate body, including the skeletal, muscular, digestive, circulatory, urogenital and endocrine systems.

45.102 Forest Measurements I — Fundamental concepts of forest engineering — measurement of distances, direction and elevation. Traverse calculations, obtaining, recording and plotting topographic detail. Care, maintenance and adjustment of equipment. This course is designed to familiarize the student with forest surveying methods used in logging layout and forest measurements.

45.103 Wood Utilization — This course is designed to enable students to appreciate the nature of the woods of the commercial tree species in British Columbia and be aware of how wood in the growing tree is affected by the natural environment and forest practices. Topics include botanical origin of wood, structure, preservation and utilization of waste wood. Non-mechanical and mechanical properties of wood are emphasized.

45.104 Natural Resources I — The structure, physiology, taxonomy and uses of plants, with emphasis on those having important biological and economic significance in the biotic zones of British Columbia. Introduction to reproduction of plants with particular emphasis on conifers. Recognition and evaluation of common plants, in forest, range land and alpine habitats of British Columbia, and their uses in land management practices.

45.106, 45.206 Photo Interpretation and Mapping I and II — Practical use and application of aerial photography in natural resources. Classification, reconnaissance, planning and inventory using aerial photos. Practice in the use of photo-interpretation aids, including the use of stereometers. Construction of forest maps and plans. Transfer of detail from aerial photos, using Map-O-Graph, Kail plotters and pantographs. Drafting and map reproduction techniques.

45.108 Introduction to Micro Computers — Introduction to computers and their application to various Forestry, Fish, Wildlife and Recreation requirements.

45.109 Introduction to Fish, Wildlife, Recreation — Basic identification of various fish and wildlife, and their importance and interaction with other natural resources.

45.110, 45.210 Fire Management I and II — Historical review of fire behavior simulated to show the effects of topography, fuel and weather conditions. Pre-suppression, including fire-danger ratings, detection, reporting and general preorganization of industrial and government agencies. "Forest Act", Part XI. Fire suppression techniques through fire simulation and prescribed burning training in initial action and problem-solving.

45.202 Forest Measurements II — Methods of measuring standing and felled timber. Direct measurement of tree diameters, heights and ages. Characteristics and use of standard volume tables. Construction of local volume tables. Types of sampling and design. Application of aerial sampling and point sampling with elementary statistical analysis. Compilation methods for sample data. Report writing.

45.203 Micro Computer Applications — Applying computer usage to practical problems in natural resources.

45.204 Natural Resources II - This course provides students with background information on and an understanding of the important uses of forest land. It covers those resources associated with forest land and the problems of administration, management, multiple use and utilization. The principal resources considered are forests, fish, wildlife, range land, water, recreation and minerals. The course also covers ecology, from two main viewpoints. Ecological principles first, and the practical application of these principles to renewable resource management second. Examples

are drawn from current environmental issues.

45.206 See 45.106

45.210 See 45.110

45.220 Soils — A study of the geology, landforms and development of soils in British Columbia. Physical and chemical nature of soils. Soil erosion and preventive measures. Soil surveys and land use studies.

45.302, 45.402 Forest Measurements III and IV — Field application of cruising techniques and data compilation by computer. Cruise-report preparation, including recommendations for environmental considerations. Preparation of forest maps. Familiarization with British Columbia cruising systems. Inventory as opposed to operational cruising. Logging-waste assessment. British Columbia log scale applications to coastal and interior operations. British Columbia board-foot rule. Weight-scaling.

45.305 Timber Harvesting — Description and analysis of timber-harvesting systems presently used on the British Columbia coast and in the interior. Techniques in the theory and application of logging layout. Environmental considerations in timber harvesting. Multiple land-use concepts. Woods safety.

45.308, 45.408 Roads and Transportation I and II — Truck road location, construction, maintenance and costing. Preparation of plans and profiles. Measurement of earth and rock work. Optimum road standards, Culvert and simple logspan bridge design, construction and maintenance. Hauling costs. Log dumps, land sorting areas and booming grounds. Water transportation of logs.

45.313, 45.413 Forest Pestology I and II — An integrated study of forest insect and disease problems. Basic life histories. The interactions of damage agencies in the forest. Improved cruise techniques related to insect and disease damage. Use of subject literature. Cooperation with authoritative government agencies. Prevention and control of damage. Measuring and reporting of insect and disease damage. Recognition of the currently important insects and diseases.

45.317 Silviculture I — Foundations of forest management; site, stocking, spacing, forest yield, forest growth and regulation; introduction to silviculture, forest regeneration, seed and stock procurement, principles of seed production and cone collection.

45.321, 45.421 Recreational Land Management I and II — An introductory course in recreational land management. Development and recreational use of areas designed as natural parks. Survey of outdoor recreation, history and organization of agencies providing recreational activities in parks. Park development, planning and design. Practical exercises in site analysis, planning and design for specific uses. Park and natural-history interpretation. Park operation and administration. Assessment and development of wildlife recreational areas both in and out of established parks. Recognition of recreational sites by aerial photo interpretation of land forms. Private and public programs in forest recreation. Land tenures and land acquisition for recreation. Wildland landscaping. Summer and winter sports area developments. Water-oriented activities, wild-land access problems and trail design, mountaineering, search and rescue.

45.322, 45.422 Wildlife Management I and II — The principles and practice of wildlife management, with particular reference to problems and procedures in British Columbia wildlife environments. The dynamics of wildlife populations. Methods of study. Harvesting. Regulations. Natural and artificial regulation of animal numbers. Diseases and parasites. The economics of wildlife, particularly in forest habitats. Extensive field study to support and extend lecture and lab material.

45.323, 45.423 Fish Management I and II — The biology of British Columbia fish, including anatomy, taxonomy, physiology, behavior and ecology. Management aspects of fisheries, including population dynamics, habitat evaluation and improvement, harvesting, pollution and fishery regulations. Labs deal with methodology as it applies to the above, and much of the training in this regard will be done in the field. Emphasis throughout is on the British Columbia situation.

45.327, 45.427 Projects — Special study seminars or projects designed to introduce students to current problems and solutions in resource management. Partial or complete involvement with potential employers will be encouraged.

45.328 Summer Technical Report — A detailed report on a phase of resource management from first-hand experience or from approved library research.

45.329 Environmental Inventory Techniques I — Basic techniques used in establishing the quality and quantity of a variety of resources. The course includes practical exercises in such areas as human use studies, animal population analysis, basic survey techniques, stream and lake survey techniques, hydrological and meteorological techniques, and forest inventory and pollution sampling techniques.

45.402 See 45.302

45.405 Log Production and Cost Control — Log production planning and scheduling. Production and cost control. Cost analysis. Operations research techniques. Contracts and contract logging. Woods organization. Industry and government relationships in logging, particularly as related to development and management of the related resources.

45.408 See 45.308

45.413 See 45.313

45.416 Forest Management — Principles of integrated resource management; planning and administration; relationship of timber production to other forest land uses; structure and organization of a forest business and enterprise; sustained yield management planning and operations; determination of cut; stumpage appraisal.

45.417 Silviculture II — Site examination, analysis and prescriptions; site preparation, planning, methods and evaluating artificial regeneration, methods application, contract, planting, costing and inspection; brush control, methods and application; spacing, methods and evaluation; conifer release, application; fertilization, methods and application.

45.421 See 45.321

45.422 See 45.322

45.423 See 45.323

45.427 See 45.327

45.429 Environmental Inventory Techniques II — A continuation of Environmental Inventory Techniques I.

45.430 Law Enforcement — This course deals with the many aspects involved in the interpretation and enforcement of legislative acts relating to the management of Canada's wildland resource. Among these are the "Fisheries Act", "Parks Act" and the "Wildlife Act".

Faculty and Staff

H.R. Chisholm, B.A.Sc., P.Eng.,
Department Head
N.E. Alexander, M.P.M.
M.R. Angelo, B.S.F., M.F.
D. Campbell, Dipl.T.
W.R. Cannon, B.A., Chief Instructor
F. Cassetta, B.Sc.F., R.P.F.
C.W. Chestnut, B.A., Ph.D.,
T.D. Chisholm, B.Ed.
E.C. Crossin, B.S.F., R.P.F.
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Chief Instructor
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R. Kley, Dipl.T.
H. Lenko, B.S.F., R.P.F.
H. Lynum, B.A.Sc., R.P.F.
R.W. Reisen, E.T.I.
H. Richardson, B.S.F.
J. Simpson, B.Sc.F., M.Sc.
B. Sivak, Ph.D., R.P.F.
P. Willms, Dipl.T.
P. Yanciw, B.A.Sc.

Mechanical

The mechanical technologist may be involved in the design, construction and installation of machines and mechanical devices, or in the production side of manufacturing. It is a field of tremendous scope in that specialists must be able to analyze problems, propose efficient technical solutions, implement these solutions and evaluate the results.

Job Opportunities
Graduates can choose from a diversity of work situations. Consulting engineering offices employ mechanical technologists as design draftsmen for machinery, steelwork, piping, power plants and installation. Others may choose to take up positions in plant engineering offices, production departments or estimating departments. Additional opportunities exist in testing, inspection, installation, service and technical sales. Supervisory posts may be assumed after appropriate job experience.

The Program
In the first three terms, all students in the technology have the same curriculum which includes math and physics, and specialized studies in mechanical engineering, production and materials. Lecture material is given practical application in problem solving and design sessions, and in lab and shop assignments. Field trips to industrial settings are an important adjunct to the classroom and lab. In the final term of their second year, students stream into one of three options: **Design, Production** or **Mechanical Systems.**

The Mechanical Technology reserves the right to limit the number of students in any of its options.

This program is accredited by the Society of Engineering Technologists.

Prerequisites
Graduation from the Selected or Combined Studies Program with Algebra 12 or Math 12 and Physics 11. Applicants should have a solid academic background and good communications skills, be able to apply ideas in practical situations and be able to work effectively with people in a team situation.

Math 12 is only acceptable if taken prior to 1978

Course of Studies

Year 1	Term 1	Clrm hrs/wk
31.149	Technical Communication	4
32.149	Basic Technical Mathematics	5
41.105	Engineering Materials	4
49.100	Mechanical Drafting I	3
49.107	Statics	4
49.145	Manufacturing Processes I	6
49.160	Engineering Economics	4
	Library and Research	5
		35

Year 1	Term 2	
31.249	Technical Communication	4
32.249	Calculus	4
33.216	Physics	4
41.205	Engineering Materials	4
49.200	Mechanical Drafting II	3
49.207	Dynamics (Term 2A)	4
49.208	Mechanics of Materials	4
49.212	Thermal Processes (Term 2B)	4
49.245	Manufacturing Processes II	4
	Library, Research and Field Trips	4
		35

Year 2	Term 3	
32.349	Numerical Methods with BASIC	4
43.353	Electrical Equipment Applications	4
49.300	Mechanical Drafting III	2
49.312	Machine Design I	5
49.325	Thermal Engineering I	5
49.335	Fluid Engineering I	6
49.345	Manufacturing Processes III	4
	Library, Research and Field Trips	5
		35

Production

Year 2	Term 4	
22.449	Operations Management	4
32.449	Statistics and Quality Control	4
49.435	Fluid Engineering II	6
49.445	Manufacturing Processes IV	5
49.450	Production Engineering Management	4
49.455	Tool Design	3
49.460	Metrology	4
	Library, Research and Field Trips	5
		35

Design

Year 2	Term 4	
32.494	Computer Graphics	3
43.455	Instrumentation	4
49.412	Machine Design II	5
49.413	Theory of Mechanisms	4
49.414	Design Projects	3
49.425	Thermal Engineering II	4
49.435	Fluid Engineering II	6
	Library, Research and Field Trips	6
		35

Mechanical Systems and Services

Year 2	Term 4	
22.439	Plant Engineering	4
43.455	Instrumentation	4
49.425	Thermal Engineering II	4
49.430	Heating, Ventilation and Air Conditioning	4
49.435	Fluid Engineering II	6
49.470	Mechanical Equipment	4
49.475	Maintenance Management	4
	Library and Research	5
		35

Subject Outlines

22.439 Plant Engineering — A course designed to relate materials handling and plant layout through detailed analysis of alternative handling systems normally encountered in manufacturing plants.

22.449 Operations Management — Planning and scheduling, job loading and levelling, network diagrams and plant layout are considered in practical applications. The student carries out studies in an industrial plant and presents a term project which encompasses much of the course material studied in class. The course and project work are closely associated with the mechanical engineering field.

31.149 Technical Communication — The objective of this course is to teach students the skills necessary for them to become effective writers and speakers in engineering industries. The lectures introduce students to communication theory and to the style, content and graphics of technical writing. The labs review writing and speaking skills and apply these to oral reporting, writing lab reports, technical letters, memos, and informal reports.

31.249 Technical Communication — This course has three objectives: (1) to teach students job application procedures and techniques; (2) to show students how to become effective researchers of engineering information; and (3) to provide practical training in the technical reporting that is used in engineering industries. Students learn how to write proposals, specifications, progress reports and feasibility studies, and they will submit a formal technical report.

32.149 Basic Technical Mathematics — Topics in algebra, logarithmic theory, trigonometry and analytical geometry, introduction to differential and integral calculus with emphasis on the mechanical field. Prerequisite for 32.249.

32.249 Calculus — An introductory course to calculus and its technical applications. Topics include the differentiation and integration of algebraic functions; related rates; curve sketching; applied maxima and minima; areas; volumes; centroids; moments of inertia; hydrostatic pressure; differentiation and integration of trigonometric, logarithmic and exponential functions; the conics; power series; partial differentiation; solution of equations by iterative methods and an introduction to differential equations.

32.349 Numerical Methods with BASIC — Numerical integration, numerical solution of differential equations, iterative solution of equations, linear programming (simplex) and an introduction to computer programming.

32.449 Statistics and Quality Control — An introduction to statistics covering the organization and presentation of data, measures of central tendency and dispersion, probability distributions, estimation and hypothesis testing and, in addition, linear regression, non-parametric statistics and topics in quality control.

32.494 Computer Graphics — This course introduces students to interactive BASIC, and concepts of programming in two and three dimensions. Students experience "hands-on" practice with computer graphics systems.

33.216 Physics — A general level course covering the elements of wave motion, sound, light and basic electricity and magnetism.

41.105, 41.205 Engineering Materials — Comparative properties of all classes of engineering materials including metals, alloys, polymers, concrete, wood and ceramics. Common causes of failure in service including fatigue, weathering, embrittlement and corrosion.

41.205 See 41.105

43.353 Electrical Equipment Applications — An introduction to industrial electrical equipment. Topics include a.c. and d.c. motors and their application to electromechanical drive systems; protecting and controlling motors; industrial electrical power systems and related equipment; sources of energy; utility rate structures, transformation into primary and secondary voltage levels, distribution of power throughout the plant; switching; voltage control; power-factor correction.

43.455 Instrumentation — Topics include basic devices used for measuring pressure, temperature, level, density and flow. Instrument static and dynamic performance. Instrument application to industrial processes. Design of pneumatic and hydraulic measurement and control equipment using high-gain amplifiers and negative feedback. Basic principles of automatic control, process, dynamic behavior and controllability. On/off, proportional, integral and derivative control. Control strategy. Ratio, cascade, multivariable and feedforward systems. Introduction to computer control.

49.100 Mechanical Drafting I — Techniques of producing and reading mechanical drawings using standard format and the development of basic skills in applying these techniques. Use of instruments, line work, lettering, geometric construction isometrics, with emphasis placed on orthographic projection, auxiliary views, sections, dimensions and working drawings.

49.107 Statics — Vectors, force systems, concurrent and coplanar, nonconcurrent and coplanar. Graphical representation and solutions. Ideas of equilibrium. Mathematical representation of equilibrium. Analysis of frames. Statically determined structures. Redundances. Beams, principle of moments and centroids. Second moment of area. Fluid statics.

49.145 Manufacturing Processes I — A basic orientation course which provides the student with practice in metal joining and metal removal, and a study of related theory.

49.160 Engineering Economics — Designed to emphasize the importance of making sound economical decisions when solving technical problems. Interest, inflation, annual cost, equivalent present worth, equipment depreciation, equipment replacement, break-even points and tax considerations are analyzed.

49.200 Mechanical Drafting II — This course expands on topics previously covered and includes: auxiliary views (simple and compound); pictorial views (isometric and oblique); descriptive geometry; intersections and developments of various shapes, threads and fastening devices; limits and fits supplemented with geometric tolerancing.

49.207 Dynamics — Kinematics; motion equations; Newton's laws; problems involving space, velocity and acceleration; centripetal force, inertia, rectilinear and rotational dynamics; work, energy and power.

49.208 Mechanics of Materials — Study of stresses, strains and deflections resulting from action of tensile, compressive, shear and torsion forces on simple types of structural and machine elements. Consideration of beams, columns, shafts, thin-walled cyclinders, riveted and welded joints. Lab testing of engineering materials and common machine elements.

49.212 Thermal Processes — This course is an introduction to 49.325, Thermal Engineering I. Topics include heat energy, work and pressure; processes and systems; enthalpy and steam properties; first law of thermodynamics.

49.245 Manufacturing Processes II — Metal removal processes: the study of modern machine tools, practical experience in their use and application, effective application of tool materials, tool life, cutting speeds, metal removal, rates and power requirements with experimental work to demonstrate these principles, costs and economics related to metal removal.

49.300 Mechanical Drafting III — This course covers topics in weld symbols, surface finish, process piping, gearing, cams and drawings for numerical control applications.

49.312 Machine Design I — This course consists of a study of the basic principles of machine design. Topics include analysis of combined stresses; theories of failure; factor of safety; stress concentration; fatigue phenomena; welded connections; bolted joints; belt drives; roller chain drives and spur gears.

49.325 Thermal Engineering I — Basic principles of energy, work and heat. Units, 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 I.C. engine cycles. Air compressors. Refrigeration cycles.

49.335 Fluid Engineering I — ISO symbols and pneumatic equipment in industrial circuits; hydraulic pump construction; differences between hydraulic and pneumatic power; design of circuits; fluid statics, pressure measurement, stability; the energy equation, continuity, flow measurement; losses in piping systems; series and parallel flow in piping systems; hydrodynamic forces.

49.345 Manufacturing Processes III — In this course the student makes a detailed study of processes such as casting hot and cold forming, extruding, forging, stamping, pressing and material joining, including machines and materials. Quantities/costs will be investigated. Manufacturing processes will be discussed in oral presentations by the student. Visits to local industries will be arranged.

49.412 Machine Design II — Basic principles derived in 49.312 are applied to various design elements. Topics include springs, anti-friction and journal bearings, power screws, spur and helical gearing, bevel and worm gearing, couplings, brakes, clutches, and critical speeds of rotating assemblies.

49.413 Theory of Mechanisms — This course is designed to provide a study of motion in machines. Topics include velocity and acceleration diagrams, planetary gearing, cams, graphical differentiation and Coriolis acceleration.

49.414 Design Projects — A course to encourage design decision-making as regards selection of materials, proportion and function of parts, drawings, dimensions, specifications and economy.

49.425 Thermal Engineering II — Mixtures of gases and vapors, Gibbs-Dalton Law, psychrometry, air conditioning, combustion processes and nozzle flow; analysis of steam and gas turbines and jet propulsion; heat transfer theory, heat exchangers and black body radiation. Practical lab investigations by students will reinforce theoretical work during the course.

49.430 Heating Ventilation and Air Conditioning — Energy considerations of heating with different fuels; heating units, cooling units; design of supply air systems, exhaust air systems, hydronic heating systems; air cleaning; heating and cooling loads; refrigeration and air cycles; balancing and control of systems.

49.435 Fluid Engineering II — Energy input and output devices; energy control devices; fluid power auxiliaries; fluid power control; dimensional analysis; model testing; fan, pump and system curves; duty point control; duct sizing and pressure losses; specific pump speed and pump types; pump selection and seals.

49.445 Manufacturing Processes IV — This course includes several lab projects designed to enable the student to utilize information and studies covered in previous courses. Emphasis is placed on analyzing the machining operation from the initial stage to completion of a job lot order. Each project includes organizing the sequence of operations, processing, programming, time and cost estimating, machine and tool set up, manufacture, inspection, quality control and the learning process.

49.450 Production Engineering Management — Plant organization and management, plant locations and layouts. Labor management relations, personnel practices, case studies, inventory control, production control and maintenance control.

49.455 Tool Design — Design of special purpose tooling as related to manufacturing. Consideration of design principles for jigs, fictures, blank and pierce, bend and draw dies, gauging practices and standard parts.

49.460 Metrology — Interferometers and associated devices. Optical comparators, measurement of surface texture and surface flatness. Air electronic, mechanical and pneumatic gauging procedures. Metrology of angles and screw threads. Use of precision measuring instruments. Fundamentals of inspection and mass production gauging.

49.470 Mechanical Equipment — A study of working principles, general specifications/characteristics and fields of application from the selection, maintenance and safety point of view for a variety of mechanical equipment commonly used in industry. Included are various drive configurations, pumps, fans, bearings, heat exchangers, air compressors, piping and valve arrangements.

49.475 Maintenance Management — The elements of this course are: basic systems, preventative maintenance and budget costs, maintenance planning, estimating, scheduling, measurement and inventory.

Faculty and Staff

S.C. Todd, M.I.Mech.E., C.Eng., F.I.E.D., P.Eng., *Department Head*
M.E. Acosta, M.I. Mar.E.(Columbia)
A.P. Adamo, B.Sc.
D.K. Bannerman, B.A.Sc., S.M., P.Eng., M.A.S.M.E.
G.T. Benson
R.M. Brown
R.O. Darling, B.Sc., P.Eng.
O.C. Edwards, B.A.Sc., M.A.Sc., P.Eng. Chief Instructor
M. Fairburn, H.N.C.
D.C. Gerlitz, B.Sc., M.S., P.Eng.
E. Graham, C.E.T., M.A.S.M.E., H.N.C.
R.G. Graham, B.Sc., M.A.S.H.R.A.E., P.Eng., Assistant Head
G. Henderson, Dipl.T., C.E.T.
B.E. Horlacher, Dipl.T.
G.D. Johnson, M.I.Mech.E., C.Eng., M.I.Prod.E. P.Eng., Chief Instructor
K. Johnson, A.S.T.M.E.
E.H. Labounty, M.A.S.H.R.A.E.
V.M. Strijack, B.Sc., P.Eng.
J.P. Sullivan, B.Sc., P.Eng., M.A.S.H.R.A.E.

Surveying

The skills of the survey technologist are in demand in a large number of businesses and industries. Surveying and photogrammetry are essential to many phases of industrial and business development including construction, natural resource exploration and development, and mapping. Surveying techniques have become more sophisticated through the use of electronic devices and computers so that shape, size and location of objects or land masses can be determined with precision and speed.

Job Opportunities

Surveying firms, consulting engineers, the oil and gas industry, government mapping, highway, planning and engineering departments and utility companies provide some of the job possibilities for surveying graduates. Employment may be found throughout Canada and around the world. This program is accredited by the S.E.T.

The Program

The British Columbia Institute of Technology offers both two year and specialized one year programs. In conjunction with the Division of Continuing Education, the Survey Department presents a training program to the Technician level.

The major surveying program is the two year course of studies leading to a National Diploma in Surveying. Students in this program acquire a solid background in math, physics, astronomy, photogrammetry, plane and geodetic surveying and computers. The practical skills of note keeping, drafting, field operations and calculations are also covered. Prospective students should have a genuine interest in mathematics, computers, earth sciences and should enjoy a vigorous outdoor lifestyle.

Students desiring a less academic program may take advantage of the more field-oriented Junior Technician level program. Students who select this program will normally complete Term One of the General Survey program and then transfer into a specialized course of studies in applied survey techniques.

Students whose interests are centred in the areas of photography, computers, and cartography, should consider the Photogrammetric Operators program. This program is a two term course of studies specializing in production photogrammetry.

Employment in surveying during the summer break is considered desirable.

Post-graduation

Following completion of the two year diploma program, students are eligible for membership in the Society of Engineering Technologists. Graduates are also granted some course credits at the University of Calgary in the Survey Engineering Division.

Prerequisites

Graduation from the Selected or Combined Studies Program with Algebra 12 or Math 12 and Physics 11. Applicants should have a good understanding of math and physics to the university level. Good health is also important because of the physical demands of survey work. Photogrammetry Option students must have good stereo vision.

Math 12 is only acceptable if taken prior to 1978

Course of Studies

Year 1	Term 1	Clrm hrs/wk
31.151	Technical Communication	3
32.151	Basic Mathematics	7
33.115	Physics for Surveying Technology	5
49.101	Drafting	3
51.101	Plane Surveying Computations	3
51.102	Hand Held Calculators/ Computers	2
51.104	Field Surveying I	8
	Library and Research	4
		35

Year 1	Term 2	
14.222	Computer Applications	2
31.251	Technical Communication	3
32.251	Calculus	7
33.215	Physics for Surveying Technology	3
49.203	Drafting - Survey	3
51.201	Plane Surveying Computations	3
51.204	Field Surveying 1	8
51.207	Photogrammetry	3
	Library and Research	3
		35

Survey Option

Year 2	Term 3	Clrm hrs/wk
14.322	Computer Applications	2
32.351	Statistics	4
51.301	Plane Surveying Computations	2
51.302	Geodetic Surveying II	3
51.303	Adjustments of Surveying Measurements	3
51.304	Field Surveying II	7
51.306	Astronomy	2
51.307	Photogrammetry	2
51.308	Description for Deeds	2
51.321	Natural Sciences	3
	Library and Research	5
		35

Year 2	Term 4	
32.451	Matrix Algebra and Numerical Methods	4
51.401	Plane Surveying Computations	2
51.402	Geodetic Surveying II	2
51.403	Mathematical Cartography	3
51.404	Field Surveying II	6
51.405	Drafting	3
51.406	Astronomy	3
51.407	Photogrammetry	4
51.408	Plane Surveying II	2
51.420	Planning and Land Utilization	2
	Library and Research	4
		35

Photogrammetry Option

Year 2	Term 3	Clrm hrs/wk
14.322	Computer Applications	2
32.351	Statistics	3
51.301	Plane Surveying Computations	2
51.302	Geodetic Surveying II	3
51.303	Adjustments of Surveying Measurements	3
51.306	Astronomy	2
51.311	Surveying	2
51.315	Cartography	2
51.317	Photogrammetry	11
	Library and Research	5
		35

Year 2	Term 4	
32.451	Matrix Algebra and Numerical Methods	4
51.401	Plane Surveying Computations	2
51.402	Geodetic Surveying II	2
51.403	Mathematical Cartography	3
51.411	Surveying	2
51.415	Cartography	3
51.417	Photogrammetry	13
51.420	Planning and Land Utilization	2
	Library and Research	4
		35

Subject Outlines

14.222 Computer Applications — This course covers computer applications in engineering and medical technologies: how a computer works; recognizing problems suitable for computer solution; flowcharting and communicating with computer personnel. Emphasis is on the use of computers to solve problems related to the technology concerned. Where available, "package" programs will be demonstrated and used by students. FORTRAN or BASIC programming language is taught depending on the technology.

14.322 Computer Applications — Advanced programming techniques in FORTRAN are taught and applied to more complicated surveying applications. Packaged programs in surveying are also taught to familiarize students as users of these programs in industry.

31.151, 31.251 Technical Communication — The emphasis of this course is on clear and concise technical writing, although some time will also be spent on oral skills. Students receive core information in the one-hour weekly lab. This information is applied to specific writing and speaking tasks in the weekly two-hour lab. Students also participate in a month-long reading and study skills course during their first year.

31.251 See 31.151

32.151 Basic Mathematics — Logarithmic theory; Euclidean and analytical geometry; plane trigonometry; spherical trigonometry.

32.251 Calculus — Derivatives; Taylor's and Maclaurin's series; the differential; partial derivatives; the definite integrals; multiple integrals.

32.351 Statistics — Descriptive statistics; probability and probability distributions; sampling and estimation; error theory; quality control.

32.451 Matrix Algebra and Numerical Methods — Basic matrix algebra operations; least square theory; correlation; solution of normal equations.

33.115, 33.215 Physics for Surveying Technology — General topics covered include light and optical instruments, kinematics, statics, dynamics, angular motion, energy, work properties of matter, temperature, thermal properties of matter, wave motion, basic electricity and magnetism and electronic distance measuring. The lab program stresses the subjects of measurement, data analysis, experimental investigation of physical laws and technical report writing. Mathematical treatment requires only algebra and trigonometry. Applications of the general topics are relevant to the Surveying Technology.

33.215 See 33.115

42.512 Elementary Hydrology — The application of precipitation data to various run-off areas is learned in order to predict run-off yield and flood magnitude. Measurement of storages and flows in the field is studied, together with characteristics of open-channel flows.

49.101 Drafting — Techniques of reading and producing orthographic drawings using standard format, and the development of basic skills in applying these techniques. Use of instruments, line work, geometric constructions, orthographic projection, isometric drawing and sketching, sections and dimensioning.

49.203 Drafting—Survey — Techniques in ink; intersections and developments; contours; profiles; rights-of-way; survey problems and projects.

51.101, 51.201 Plane Surveying Computations — Mathematical basics; plane trigonometry; solution of triangles; computers; coordinate systems (Rectangular, Polar); inversing bearings and angles; traverses (open and closed); adjustments, compass and transit rules; location of errors; missing parts; U.T.M. traverses; adjustment of level loops; areas by D.M.D. and coordinates; geometry of the circle; application of curves in surveying; vertical curves; introduction to transition curves; areas and volumes; intersection and resection, inaccessible base.

51.102 Hand Held Calculators/Computers — The student is oriented to the efficient use of their calculator/computer to solve various survey and mathematical problems through calculating and programming. It is assumed that the student has purchased an inexpensive, hand held, programmable calculator computer in BASIC. An introduction to BASIC language is taught, with structure and use of programs.

51.104, 51.204 Field Surveying I — An introduction to the types of surveying and the history of surveying. The course also covers fundamental principles; accuracy and precision; linear measuring; trigonometric and differential levelling; plane table; angular measurement; compasses; theodolites; basic electronic distance measuring; stadia; circular curves; and topographic surveys.

51.201 See 51.101

51.204 See 51.104

51.207 Photogrammetry — Introduction to aerial photographs and other remote sensing acquired data; use of map and air photo; geometry of the air photo (scale, displacement and parallax); optics for photogrammetry (refraction, reflection, prisms and lenses); stereoscopy and stereoscopes; radial line triangulation and planimetric map compilation; and aerial cameras.

51.301, 51.401 Plane Surveying Computations — Geometric spaces in surveying, surveying measurements, propagation of errors, computers and numerical approaches in surveying; computations of control surveys, triangulation, trilateration, traversing, reduction of eccentric measurements, intersection, resection, inaccessible base; transformation of coordinates, partitioning of land, horizontal and vertical curves; integrated surveying; deformations; three dimensional surveying systems.

51.302, 51.402, Geodetic Surveying II — This course generally deals with surveys which take into account curvature of the earth. It covers computations on the ellipsoid, triangulation, trilateration, trigonometric levelling, geodetic levelling, satellite geodesy and electronic surveying.

51.303 Adjustments of Surveying Measurements — Definitions and classification of errors, measures of precision; propagation law of standard errors; weights and propagation of weights; principle of least squares (in matrix notation); adjustment by variation of parameters; conditional observations; combined adjustments; adjustments of triangulation — trilateration nets—and of traversing.

51.304, 51.404 Field Surveying II — This course deals with the field methods used in conjunction with plane and geodetic surveying. Course work is done together with 51.304 (students learn how to use the different instruments) and 51.404 (students make use of the instruments in practical projects). The projects are aimed at engineering, hydrographic, mining, legal and precise surveys, and include some triangulation and trilateration work.

51.306, 51.406 Astronomy — An introduction to practical astronomy: spherical trigonometry; the celestial sphere; the astronomical triangle; universal time; mean solar time; sidereal time; the ephemeris and star almanacs; instruments used in solar and stellar observations; star identification; observations for latitude; observations for time and longitude; observations for azimuth.

51.307, 51.407 Photogrammetry — 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 sterioplotters; sterioplotters with mechanical or optical mechanical projection systems and automated stereo plotting instruments; application of on- and off-line projection systems and automatic contouring during orthophotoproduction; and the location of points by intersection from two or more terrestrial photographs.

51.308 Description for Deeds — The purpose and characteristics of descriptions; systems of survey, township system and district lot system; the preamble; the correct use of the words "more or less" descriptions by adjoiners; descriptions by aliquot parts; description by metes and bounds; descriptions by exceptions; descriptions of right-of-way by means of centre line; plans to accompany descriptions; Land Registry Office procedure; strata and space titles.

51.311, 51.411 Surveying — Control surveys by triangulation, trilateration and traversing; indirect optical distance measurement; electro-magnetic distance measurements; the gyro-theodolite; trigonometrical and barometric levelling.

51.315, 51.415 Cartography — Drafting principles as applied to photogrammetric compilation and cartography; inking and scribing techniques; surround detail; lettering and scales; production procedures.

51.317 Photogrammetry — The geometry and physical nature of the photograph; optics for photogrammetry; principles of photography; dark room procedures; aerial cameras; stereoscopy; the spatial model; comparator measurements of photocoordinates; planning aerial photography; plotting instruments; classification and operation of stereoplotters; aerial triangulation; photogrammetric control extension, coordinate transformation; use of electronic computers; photo-interpretation; terrestrial and oblique photogrammetry; map compilation; cartography; remote sensing; photogrammetric refinement; general specifications.

51.321 Natural Sciences — A study of the forest flora of British Columbia; the characteristics of native trees, their identifying features and common uses; elementary geology, including the study of rocks and minerals, geologic structures, general location and uses of common ores, soil classification and location.

51.401 See 51.301

51.402 See 51.302

51.403 Mathematical Cartography — Concepts and properties of maps; classifications of maps; theory of distortions; conformality; equivalency; Tissot's indicatrix, conical projections; cylindrical projections; perspective projections; polyconic projection of British Columbia; UTM projection; stereographic projection of New Brunswick.

51.404 See 51.304

51.405 Drafting — Application of drafting for the preparation of topographical plans; subdivision plans; drafting principles for scribing and inking of contours; drafting materials and reproduction procedures.

51.406 See 51.306

51.407 See 51.307

51.408 Plane Surveying II — This course generally deals with surveys which do not have to account for curvature of the earth. Analysis of methods and instrumental errors, use of specialized equipment. Application of survey methods to engineering surveys, mining surveys, hydrographic surveys, legal surveys and higher order surveys.

51.411 See 51.311

51.415 See 51.315

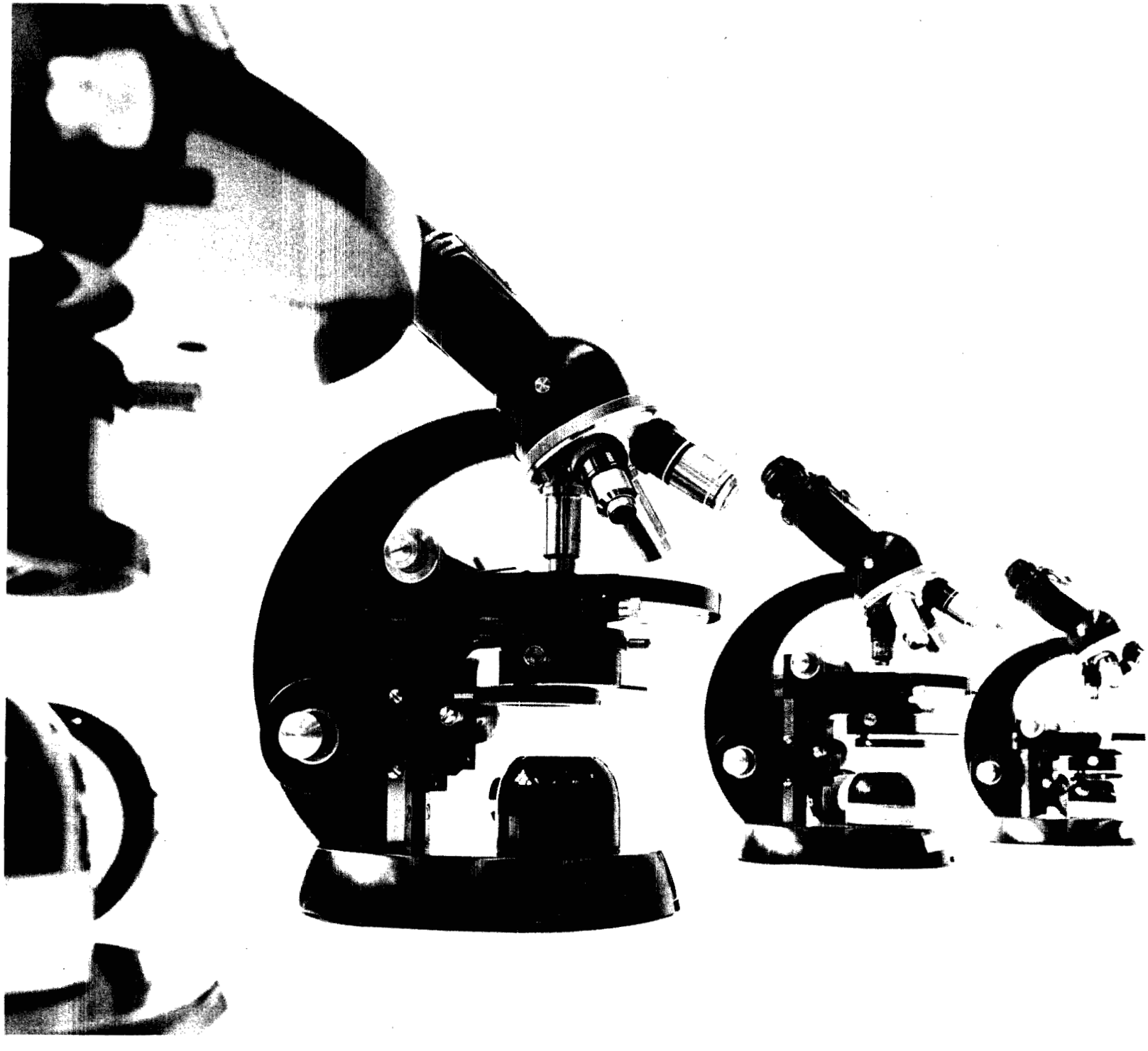
51.417 Photogrammetry — Coordinate transformations; colinearity and coplanarity equations; accuracy of coordinate determination; aerial triangulation — preparation, measuring, and adjustment; applications of photogrammetry in survey and mapping projects; introduction to digital mapping.

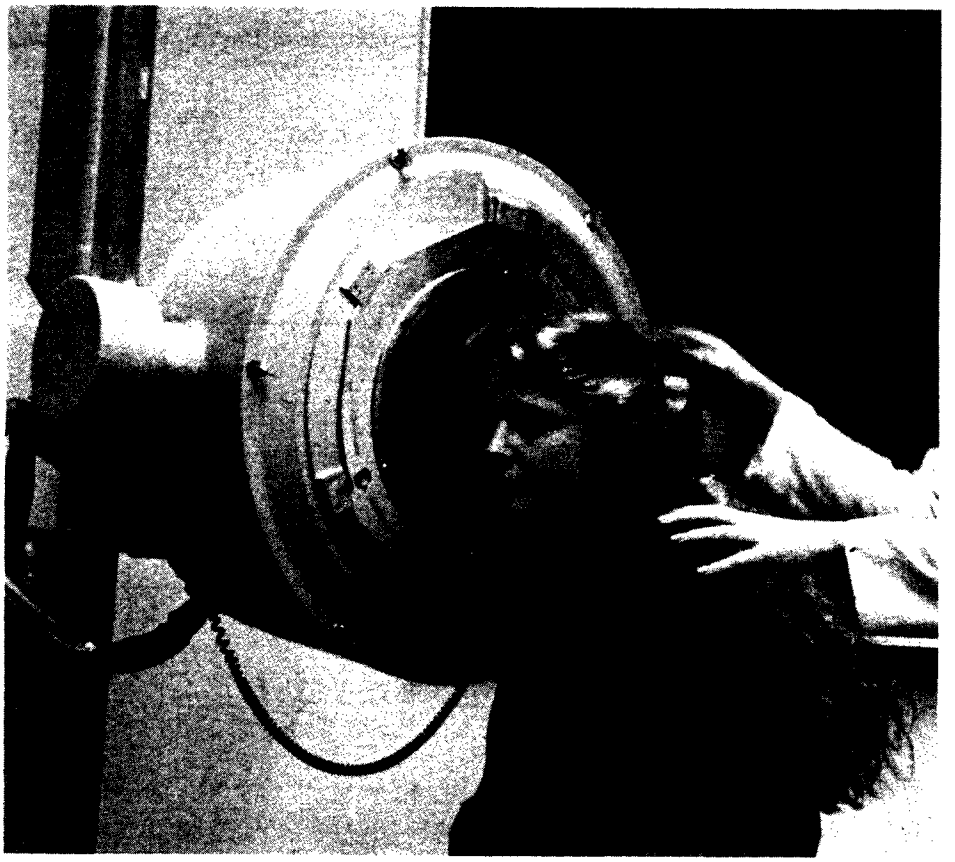
51.420 Planning and Land Utilization — The planning process as it applies to physical planning; planning authorities and their powers; government legislation in the planning field; zoning and its implications in land use and development; land use and land use studies; subdivision design and economics.

Faculty and Staff

R.I. McNeil, B.Surv., B.C.L.S., D.L.S., Dipl. Adult Ed., P.Eng., *Department Head*
G.E. Anderson, Dipl.Adult Ed.
G.T. Bedwell
R. Bremner, Dipl.T.
J.S. Caldwell
D.C. Deans, B.A., Chief Instructor
K. Errington, B.C.L.S., Cert.Min.Surv., Senior Instructor
K. Frankich, Dipl.Ing., M.A.Sc.
K. Gysler, B.Eng., M.Eng., D.L.S., P.Eng., Chief Instructor
D. Jarvos, Dipl.T.
G. Kehoe, B.A.Sc., B.C.L.S.
A.M. Nelson, C.E.T., Senior Instructor
E.H. Schlegel
W.A. Tupper, Dipl.Ing.
N. Wong, Dipl.Ing., A.R.I.C.S.

Health





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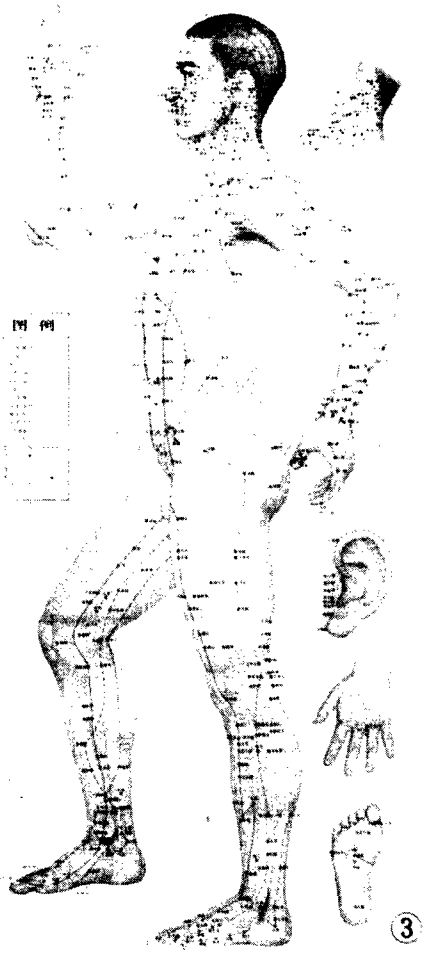
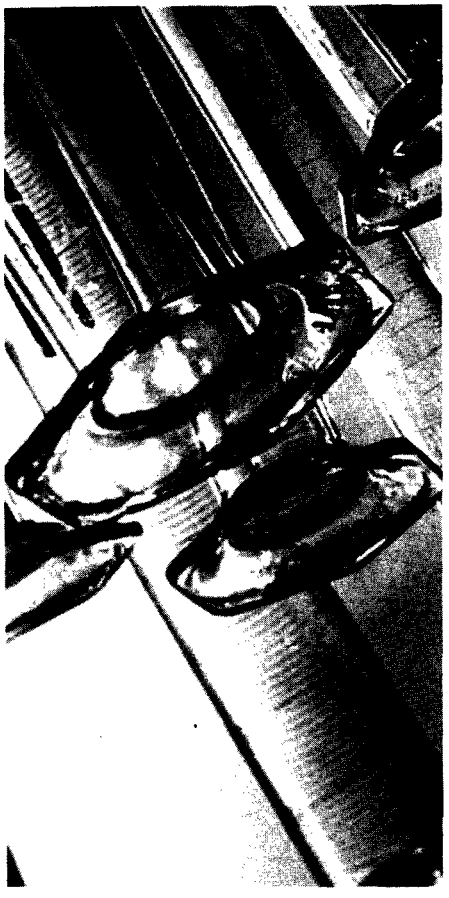




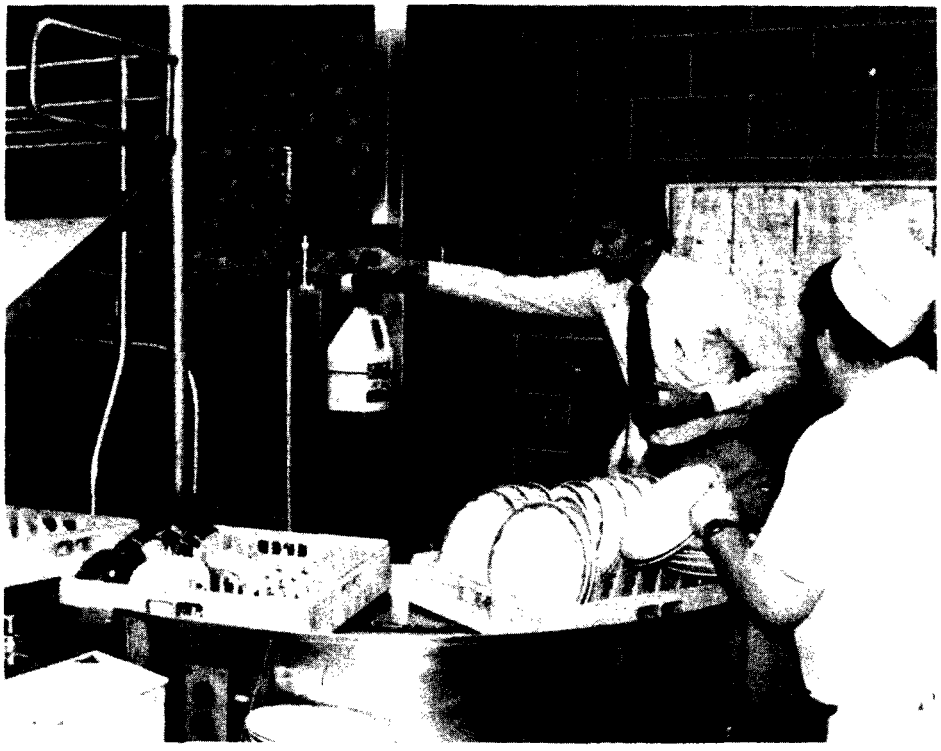
Basic Health Sciences

Department of Basic Health Sciences

This department provides basic courses in human anatomy and physiology, genetics, immunology, microbiology and the behavioral sciences for students enrolled in health technology programs. These courses are designated by the prefix "98". Each course is oriented towards a particular technology so that, although the material studied is introductory in nature, the student quickly becomes aware of applications. In many cases these courses become the foundation upon which specific technology subjects are built. The department's responsibility, therefore, is to teach those concepts of biological and behavioral sciences which are most important for the health technology student and graduate.

Faculty and Staff

D.W. Martin, B.Sc. (Hons.), M.S.R.
Department Head
B.M. Alder, B.S.N., R.N., M.A.
R. Bakan, B.A., M.A., Ph.D.
Miss M.E. DuVernet, B.A.
J.H. Emes, B.Sc. (Hons.), M.Sc., Ph.D.
A.G. Handford, B.A.
G.R. Marshall, B.Sc. (Kines.), M.Sc. (Kines.)
T.J. Nowak, B.A., Dipl.Ed.
E. Shkurhan, B.Sc., M.Sc., Chief Instructor



Environmental Health

Department of Environmental Health Services

Public Health Inspector Training

The public health inspector is a vital member of the community health delivery system. His or her role includes improving the environment through the use of education, consultation, inspection and monitoring techniques and, if necessary, by the enforcement of health legislation. This role is applied in the areas of food hygiene, insect and rodent control, communicable disease investigation, public accommodation, community care facilities, public recreational facilities, water supply and waste disposal systems, occupational health and safety and environmental pollution — air, water, soil and noise.

The graduate provides leadership and technical expertise in the development of long-range planning to protect and improve community health.

To meet these demands the candidate must be a mature, practical person and possess excellent communicative skills, as well as considerable tact and discretion in working with people at all levels within the community.

Job Opportunities

Employment possibilities for public health inspectors include municipal, provincial and national health agencies, environmental and pollution control agencies and private businesses and industries like food processing, catering and fisheries. Occasional openings occur in the teaching field. Some employment opportunities exist in the industrial health and hygiene area for students who also possess an undergraduate degree.

The Program

The cross-disciplinary curriculum includes general studies in health, engineering, math and the physical and social sciences in order to give students a thorough understanding of the many health hazards in the environment and to equip them to measure, evaluate and recommend controls of these hazards. Modes of instruction include lectures, labs and field experience.

Prerequisites

Graduation from the Selected or Combined Studies Program with Algebra 12 or Math 12 and Physics 11 and Chemistry 12. Applicants must be in good health. The nature of the work precludes individuals who are severely handicapped. Applicants should be able to show evidence of maturity, have a positive outlook and be interested in serving the community. Acceptance is dependent on a preselection interview.

Math 12 is only acceptable if taken prior to 1978

Post-graduation

After completing the requirements of the two-year program leading to a Diploma of Technology, graduates must complete six months of field training in a recognized health unit under the direction of a medical health officer and a public health inspector. Successful candidates may then sit a national oral examination to qualify for a Certificate in Public Health Inspection (Canada) granted by the Board of Certification of the Canadian Institute of Public Health Inspectors.

Course of Studies

		Clrm
Year 1	**Term 1**	hrs/wk
30.108	General Chemistry for Environmental Health	6
31.188	Communication for Health Technologists	3
32.182	Basic Mathematics	4
82.101	Environmental Health and Engineering I	4
82.102	Food Sanitation	4
82.103	Public Health Inspection I	4
98.123	Public Health and Pollution Control/Microbiology	3
	Library and Research	7
		35

Year 1	**Term 2**	
30.208	General Chemistry for Environmental Health	6
31.282	Communication for Health Technologists	3
32.282	Statistics	4
33.212	Environmental Physics	3½
82.204	Drafting and Blueprint Reading (and Surveying)	2
82.205	Public Health Inspection II	4
82.206	Private Water Supplies and Waste Disposal Systems	4
98.204	Basic Anatomy and Physiology	2
98.223	Public Health and Pollution Control/Microbiology	3
	Library and Research	3½
		35

Year 2	**Term 3**	
30.313	Instrumental Analysis	4
82.307	Public Health Administration I	2
82.308	Environmental Health and Engineering II	4
82.309	Air Pollution	3½
82.310	Technical Research Methods	7
82.311	Environmental Health Relations	5
82.312	Environmental Noise	3½
	Library and Research	6
		35

Year 2	**Term 4**	
30.418	Industrial Chemical Processes	2
41.413	Environmental Analytical Methods	3
82.413	Food Hygiene	3
82.414	Public Health Administration II	2
82.415	Personnel Administration	3
82.416	Public Health Law	3
82.417	Municipal Water and Sewage Treatment Systems	3

Year 2	Term 4 cont.	Clrm hrs/wk
82.418	Industrial Hygiene and Toxicology	5
82.419	Technical Research Methods	3
98.424	Communicable Disease Control	3
	Library and Research	5
		35

Note: Curriculum subject to revision.

Subject Outlines

30.108, 30.208 General Chemistry for Environmental Health — A special introductory course which covers general, organic, biochemistry and a selection of topics of special interest in the environmental health field. The general chemistry deals with stoichiometry and examples stress the calculations associated with water and waste water analysis. Structures of the most common organic functional groups, and the physical properties of these are discussed. When organic chemicals are introduced they are related to environmental problems that occur in oil refining; fuel combustion and pesticides. Biochemistry covers proteins, carbohydrates and fats with particular emphasis on the end-products of biological degration. Special topics like alkalinity, hardness, water softening, colloids, swimming pool chemistry, volatile acids, biological oxygen demand and chemical oxygen demand are covered.

30.208 See 30.108

30.313 Instrumental Analysis — This course introduces basic theoretical concepts, instrument construction and operation and general application of the following methods: potentiometry, polarography, refractometry, polarimetry, visible, ultra-violet and infra-red, and includes absorption and emission flame photometry and gas chromatography.

30.418 Industrial Chemical Processes — This course is designed to give the student an overview of the various chemical processes used in industry; the chemicals used, chemical reactions, products manufactured, waste products and pollutants produced and the hazards to personnel. Students will make field trips to selected industries.

31.188, 31.282 Communication for Health Technologists — This course provides an introduction to the general principles of writing and their application to professional writing tasks. A short course in reading and study skills is included.

32.182 Basic Mathematics — Measurements systems of units; review of algebra, functions and graphs; exponents and logarithms, logarithmic and exponential equations; log-log and semi-log graphs; trigonometry.

32.282 Statistics — Descriptive statistics; probability; binomial and normal distributions; sample mean and estimation; hypothesis testing; regression and correlation.

33.212 Environmental Physics — An introduction to the physical principles, properties and relationships of physical quantities and how they affect each other. Motion, force, energy, power, properties of matter, thermal energy, electricity, wave motion, sound light and radiation as they apply to environmental topics. The lab program emphasizes measurements, data analysis and experimental techniques while confirming and expanding the lecture concepts.

41.413 Environmental Analytical Methods — This course embraces a survey of methods suitable for the examination of many types of water, waste water and materials related to control of sanitation and water quality. Reference is made to the "Standards Methods" for the analysis of water and waste water, 13th edition, published by the American Public Health Association. However, in many instances adaptations and improvements are introduced. Typical industrial pollution problems related to local industry are discussed during the lab periods and special attention is given to proper sampling techniques. Ecosystems are discussed leading to various methods from B.O.D. analysis and C.O.D. A selection is made from the following analysis of field samples: cyanide (Serfass distillation method), pesticides (sampling, extraction, clean-up and detection methods), arsenic, mercury, nitrogen (ammonia, nitrate, organic), oxygen (D.O., B.O.D., C.O.D.), surfactants, phosphates (total, ortho, poly), sulphates, chlorides, proteins, carbohydrates, tarmin and lignin, phenols, heavy metals (Cu, Fe, Pb, Cr, Hg, and Cd). Two field trips are included on practical water sampling and the provincial environmental water resources lab.

82.101, 82.308 Environmental Health and Engineering I and II — This course will cover a number of topics relevant to the field of environmental health. Topics included will be insect and rodent control, solid waste collection and disposal, emergency measures, camp and recreational sanitation, housing, community planning and swimming pools.

82.102 Food Sanitation — This is an introductory course in the sanitary practices and inspection techniques associated with the production, processing and distribution of food. Given lectures and field situations, the student will be able to explain the danger of food-borne illness in Canada, identify potential places where food may become contaminated in food service outlets and investigate and analyze how food-borne disease outbreaks occur.

82.103, 82.205 Public Health Inspection I and II — This course will provide the student with a knowledge of duties and responsibilities in governmental organizations. A detailed review of related environmental and health legislation will be covered, as well as the division of control and authority at the federal, provincial and local levels. Control techniques and methodology used by governmental organizations is stressed.

82.204 Drafting and Blueprint Reading (and Surveying) — Fundamental introduction to drafting: lettering, oblique and isometric perspective presentation techniques, charts and graphs, topographic maps, subdivisions and plan and profile of sewer systems. Fundamental introduction to blueprint reading; principles in design of buildings; food processing plants; swimming pools; campsites; plumbing; ventilation; lighting; acoustics; floor and building layouts. Surveying.

82.205 See 82.103

82.206 Private Water Supplies and Waste Disposal Systems — An introductory course which examines the means, methods and the design and construction of facilities required to provide adequate potable water and sewage disposal in areas where municipal treatment systems are not available. Associated health hazards, protective measures and how to solve problems encountered in individual systems will be considered. Further topics will include the characteristics of, and disposal methods for, agricultural wastes.

82.307, 82.414 Public Health Administration I and II — The theoretical aspects of public health administration will be examined, showing the administrative philosophies from the classical school of administration to present-day philosophy. These administrative concepts will be dealt with as they apply to the functioning of governmental agencies and health departments. Particular reference will be made to Canadian governmental organization.

82.308 See 82.101

82.309 Air Pollution — This course will place emphasis on the contemporary problem of air pollution in terms of the nature, sources and effects of air pollutants, regulatory guidelines and the application of engineering control measures. The associated lab work will emphasize sampling and analytical procedures for evaluating atmospheric contaminants and stack emissions.

82.310, 82.419 Technical Research Methods — This course provides for the development of research methods and communication skills necessary in designing technical research reports. Special emphasis will be placed on predicting future trends in the field of public health. This course is designed to encourage the student to be self-assertive and creative.

82.311 Environmental Health Relations — — This course examines the interrelationships and interactions between various government departments, agencies and corporations. Additionally, the

forces which underly the social behavior of groups, large organizations and communities will be examined. Interpersonal relations will be exemplified through the practical application of public health education and the interaction of personnel in the environmental health field. Principles of public relations will also be examined with emphasis on problems peculiar to public health.

82.312 Environmental Noise — This course will cover noise topics relevant to the field of environmental health with emphasis on occupational and community noise assessment and control. The lab course will emphasize audiometry, noise measurement and analysis and calibration techiques, utilizing state-of-the-art instrumentation.

82.413 Food Hygiene — This course reviews food preservation techniques and sanitary practices in the food processing industry. Given lectures and field situations, the student will be able to assess and analyze public health related problems in primary food production and processing outlets; e.g. dairies, abattoirs, fish canneries. He or she will also be able to investigate and analyze common food-borne illness outbreaks related to the above industries.

82.414 See 82.307

82.415 Personnel Administration — An introduction to the fundamental procedures of personnel administration as applied to public health organizations. Particular emphasis will be placed on individual interaction within the structure, and techniques used to obtain the maximum effectiveness and efficiency of public health personnel.

82.416 Public Health Law — An examination of the legal system which serves our society, followed by a detailed look at certain areas of substantive law which the public health official is likely to come in contact with in carrying out his or her duties. Special attention will be given to that body of legislation designed for the protection and promotion of individual and community health. Court procedure and evidence giving are examined in depth.

82.417 Municipal Water and Sewage Treatment Systems — This course is designed to familiarize the student with the protection, treatment, distribution and associated problems of municipal water supplies. Various methods of municipal sewage treatment, the collection system, characteristics and treatment of domestic and industrial wastes and waste disposal problems will be studied. Future trends will be considered.

82.418 Industrial Hygiene and Toxicology — This is a survey course in occupational health. Given lectures, laboratory exercises and field situations, the student will be able to recognize common occupational health hazards, demonstrate how to use appropriate environmental sampling equipment and recommend control measures which would alleviate potential health hazards.

82.419 See 82.310

98.123, 98.223 Public Health and Pollution Control/Microbiology — An introduction to those areas of microbiology which the public health inspector will use in his or her daily work. The areas include the structure and physiological characteristics of bacteria, viruses and fungi and their significance to food, water, sewage and waste disposal.

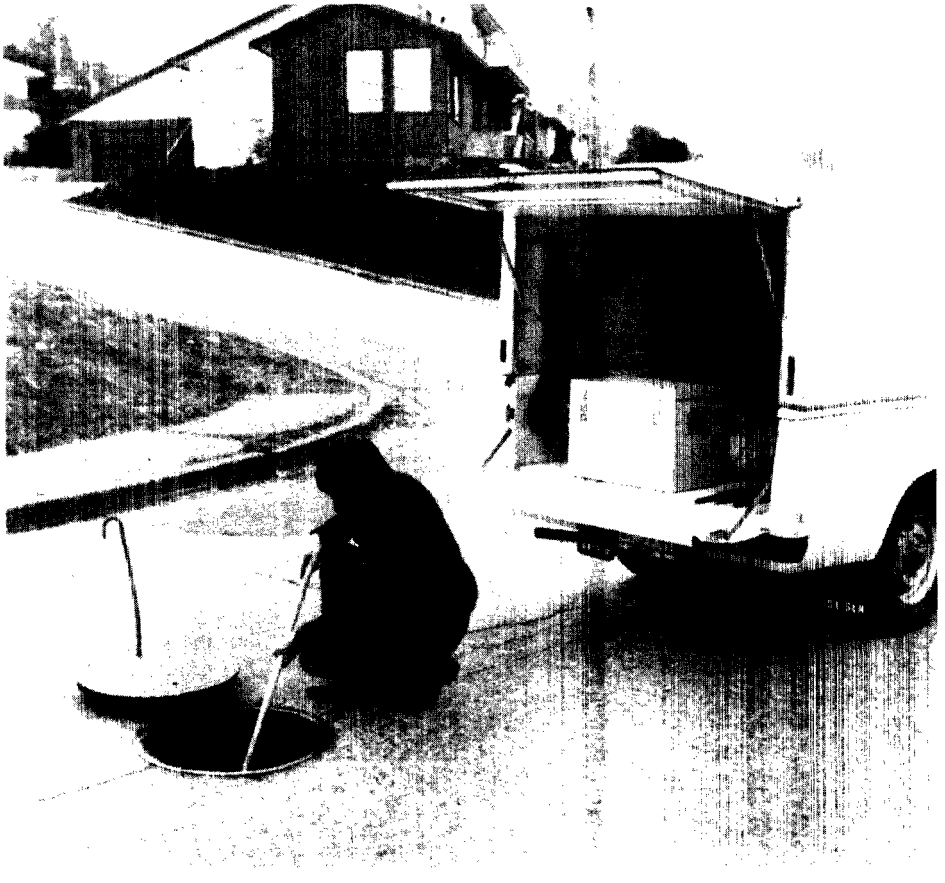
98.204 Basic Anatomy and Physiology — This course is designed to provide a basic knowledge of human anatomy and physiology. Emphasis is placed on the physiology of the human body systems and how environmental factors can affect these systems.

98.223 See 98.123

98.424 Communicable Disease Control — This course is designed to provide the student with a sound knowledge of the natural history, spread and control of communicable diseases. Emphasis is placed on modes of transmission and control of diseases of provincial and national importance.

√ Faculty and Staff

John M. Pelton, B.A., C.P.H.I. (C),
Department Head
E.J. Borsky, Dipl.T.
A.A. Guite, B.Sc., M.P.M., C.P.H.I. (C)
C.L. Young, C.E.T, C.P.H.I. (C)



Occupational Health and Safety

Department of Environmental Health Services
One of the primary purposes of this program is to graduate individuals who are able to provide the knowledge and leadership necessary to develop programs in industry that will assist in conserving life, health and property. They will consult with company and labor officials on ways to improve productivity by implementing loss control programs.

Graduates will also identify health and safety hazards in the work environment and advise corrective action.

The occupational health and safety officer will assume a major role in the development and conduct of safety-training programs for workers. Accidents will be investigated to identify their root causes, and methods found to eliminate recurrences.

To achieve these career objectives the applicant is expected to be a mature, objective person who possesses the ability to communicate decisions and goals in a tactful and professional manner.

Job Opportunities
Employment opportunities in the Occupational Health and Safety field are excellent. Private industry and the public sector have shown a definite need for graduates.

Career openings are available in industries where the health and safety of the workers is of concern.

The Program
The science-oriented program includes combined studies in the health, engineering and business fields. This ideal combination prepares the student to understand the potential safety and health hazards of the work environment, as well as the human relations involved in seeking a beneficial solution or method of improving the workplace environment.

Prerequisites
Graduation from the Selected or Combined Studies Program with Algebra 12, Chemistry 11 and Physics 11 or their equivalents. Mature students lacking a prerequisite will be considered on their related academic or employment records. Candidates will be interviewed.

Course of Studies

		Hrs./wk Clrm	Lab
Year 1	**Term 1**		
30.118	Chemistry I (Fundamental Principles)	3	2
31.188	Communication and Technical Report Writing I	3	—
	Library and Research	9	—
		25	10
Year 1	**Term 2**		
10.021	Organizational Behaviour Fundamentals	2	—
30.218	Chemistry II	3	2
31.288	Communication and Technical Report Writing II	3	—
32.283	Calculus, Probability and Statistics	3	2
33.210	Physics II	3	2
41.288	Engineering Concepts I	1	2
88.202	Principles of Accident Prevention II	4½	—
98.204	Anatomy and Physiology	2	—
	Library and Research	4	—
		25½	8
Year 2	**Term 3**		
10.047	Personnel Fundamentals	2	—
22.388	Management Engineering (with Ergonomics)	2	3
30.318	Organic Chemistry I	2	3
41.388	Engineering Concepts II	2	2
88.302	Fire Protection	3	2
88.303	Policies in Industrial Health and Safety	3	—
88.304	Industrial Hygiene I	1	—
	Library and Research	9	—
		24	10
Year 2	**Term 4**		
10.032	Industrial Relations Fundamentals	2	—
30.418	Organic Chemistry II	2	3
31.488	Communication and Technical Report Writing III	2	—
49.488	Machine Design	2	2
78.488	Fundamentals of Electrical Power and Electrical Machinery	2	2
88.403	Loss Control and Auditing	4	—
88.404	Industrial Hygiene II	4	2
88.412	Industrial Chemical Processes	3	—
	Library and Research	5	—
		26	9

Subject Outlines

10.021 Organizational Behaviour Fundamentals — This course is the study of man's behaviour and attitudes in an organizational setting. Topics include the organization's effect on personal perceptions, feelings, and actions and their effect on the organization, as well as the individual's effect on the achievement of the organization's purposes. Concepts such as leadership, communications, power, authority, change and conflict are examined.

10.032 Industrial Relations Fundamentals — 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.

10.047 Personnel Fundamentals — An introduction to the fundamentals of personnel management including human resource planning; recruiting and selection techniques; job analysis, descriptions and evaluation; compensation administration; performance appraisal systems; training; and employee safety and health. Current British Columbia employment legislation is also reviewed.

22.388 Management Engineering (with Ergonomics) — The scientific approach to problem-solving, with particular attention to business enterprises. Topics include method study, activity sampling, layout, forms design and control, the critical path method of scheduling, planning, and work measurement. The projects require research and detailed analysis, plus the preparation and presentation of technical reports.

30.118, 30.218 Chemistry I and II (Fundamental Principles) — An introductory course in which emphasis is placed on topics of primary importance to Occupational Health and Safety, including: flammable and explosive materials; fire and fire extinguishing materials; corrosive materials; mutagenic, carcinogenic and toxic materials. In dealing with more general topics, cases and examples are selected which are of particular interest to the student in this technology. Weekly laboratory exercises reinforce awareness of chemical hazards and develop basic chemical knowledge.

30.218 See 30.118

30.318 Organic Chemistry I — Includes a study of the major functional groups with emphasis on the nomenclature, structure, and physical and chemical properties of those compounds that are occupational health hazards within each functional group.

30.418 Organic Chemistry II — Includes a study of the structure and function of proteins, enzymes, carbohydrates, fats and nucleic acids. The emphasis will be on the biochemical factors that affect the toxicity of organic chemicals.

31.188, 31.288, 31.488 Communication and Technical Report Writing I, II, and III — Course content consists of lectures in theory, and lab sessions to practice writing skills. A summary of content includes: writing fundamentals, medical terminology, letter writing strategy, employment correspondence, memo writing strategy, construction and use of forms, writing the short report, library research techniques, oral communication skills, and efficient reading/listening techniques.

31.288 See 31.188

31.488 See 31.188

32.183 Basic Mathematics — Topics covered include mensuration; applied mathematics from algebraic and analytical geometry topics; exponential theory and applications including log graphing; trigonometry with some vector analysis; some numerical methods for hand calculator or mini computer use; and introduction to differential calculus.

32.283 Calculus, Probability, and Statistics — Topics covered include algebraic derivatives and applications of differentiation; integration, applications of integration and elementary differential equations; descriptive statistics; probability, bionomial, poisson and normal distributions; sampling; estimating; and regression.

33.110, 33.210 Physics — An introductory course with emphasis on the application of physics within the health and safety field. Topics covered include kinematics, dynamics, friction, statics, angular motion, energy, momentum, simple machines, properties of matter, fluid mechanics, temperature and heat, basic electricity and magnetism, wave motion and sound, optics and atomic and nuclear phenomena. The lab program stresses the subjects of measurements, data analysis, experimental technique and report writing. Mathematical treatment requires algebra and trigonometry.

33.210 See 33.110

41.288, 41.388 Engineering Concepts I and II — This course covers test procedures for mechanical properties; non-destructive testing and failure analysis; and the basic concepts of engineering materials including metals, alloys, plastics, woods, ceramics and concrete.

41.388 See 41.288

49.488 Machine Design — An introductory course in machine design, with emphasis on elementary design and analytical procedures for machine components. The course covers theories of failure, combined stresses, stress concentration, fatigue phenomena, welded and threaded connections, shafts, belt and chain drives, spur gearing, and an introduction to various other machine elements. Selection procedures for standard machine components are reviewed. Problems are handled in both S.I. and British units.

78.488 Fundamentals of Electrical Power and Electrical Machinery — This is an introductory course in electrical power and machinery with an emphasis on safety aspects. Topics include electrical technology, insulators, conductors, magnetism, capacitors, transformers, Canadian electrical code, motors, generators, high voltage, hazardous locations, overload, electrical injuries, grounding, transformers, lock-out procedures and limits of approach.

88.102 Principles of Accident Prevention I — This course covers the history of the safety movement, a management approach to accident prevention, the root cause of accidents, the real cost of accidents, accident investigation, inspections, job safety analysis, maintaining interest in safety, special problem solutions, motivation, the problem employee, and off-the-job safety.

88.108 Drafting and Blueprint Reading — This is an introductory course in drafting and blueprint reading with emphasis on areas of concern to the safety professional. Specific areas include construction features such as plant designs, lighting layouts, ventilation systems, fire doors and fire walls, machine details, guarding, and electrical details.

88.202 Principles of Accident Prevention II — This course covers accident prevention for industrial operations. The engineering and technology involved in the various operations is examined. Topics include industrial buildings and plant layouts; construction and maintenance; manual handling and material storage; hoisting apparatus and conveyors, ropes, chains and slings; powered industrial trucks; elevators; principles of guarding; woodworking and metal working machinery; cold forming of metals; hot working of metals; and welding and cutting.

88.302 Fire Protection — This course covers handling and storage of flammable and combustible liquids, chemical hazards, dust explosions, bleve, electrical hazards, construction features, chemistry of fire, fire detection, portable extinguishers, automatic sprinkler systems, and inspection procedures.

88.303 Policies in Industrial Health & Safety — This course deals with legislation relevant to the safety field. The various legislative requirements as well as the agencies enforcing them will be examined. Also covered are advisory and testing organizations.

88.304 Industrial Hygiene I — This course will review relevant topics in acoustics, audiometry, noice 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. Prerequisites: Year 1 of the Occupational Health and Safety program, or permission of the instructor.

88.403 Loss Control and Auditing — This course covers emergency planning, insurance aspects, computers in safety, auditing, design of a complete safety program, office safety and a study of the loss control aspects of typical B.C. industries.

88.404 Industrial Hygiene II — This basic course is designed to allow the student to identify, monitor, evaluate and recommend control measures for common chemical and physical hazards in the work place. The first part of the course reviews the concepts of toxicity and hazard as they apply to the development of permissable levels. The toxicity of common gases, vapours, dusts, and fumes is reviewed. The second part of the course discusses the hazards associated with excessive exposure to ionizing and non-ionizing radiation, temperature extremes, and pressure extremes.

The laboratory portions of the course will teach the student to use equipment commonly used in surveying for industrial hazards. Ventilation control measures and respirators will also be reviewed. Prerequisites: Industrial Hygiene I, or permission of the instructor.

88.412 Industrial Chemical Processes — This course is designed to give the student an understanding of the chemical processes involved in selected industries; the chemicals used, chemical reactions, products manufactured, waste products, pollutants produced and methods of emission control. Chemical aspects of air pollution and health effects of pollutants are also discussed. Tours: Guided tours to selected industries will be conducted. Attendance is compulsory.

98.204 Anatomy and Physiology — This course is designed to provide a basic knowledge of human anatomy and physiology with emphasis on the physiology of the human body systems and how environmental factors can affect these systems.

NOTE: Curriculum subject to revision.

Faculty and Staff

John M. Pelton, B.A., C.P.H.I. (C), *Department Head*
Lars G. Larsson, C.R.S.P., Program Head

Biomedical Electronics

Department of Health Engineering Services — In recent years there has been a growing demand for technologists with knowledge in both medical and engineering fields. The widespread use of medical electronic apparatus for diagnostic and therapeutic purposes, and an awareness of the need for its safe use and maintenance, have further increased this demand.

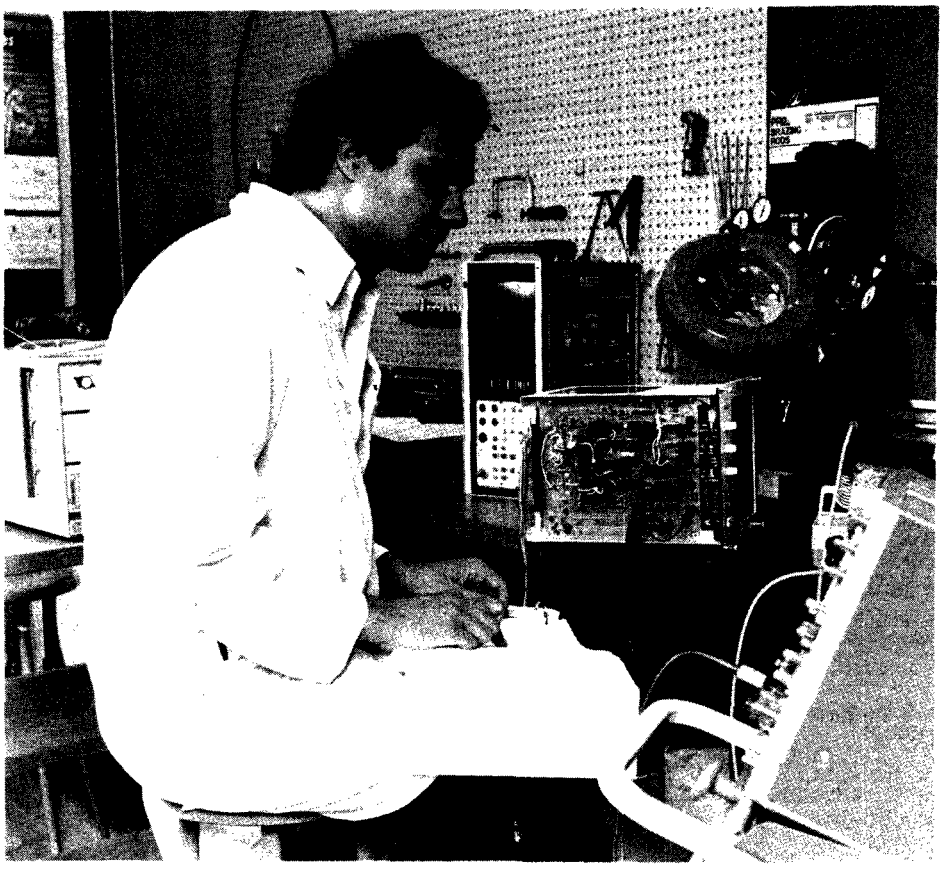
For students interested in the Biomedical Electronics Technology there are two program options — Biomedical Electronics and Electrophysiology. While the two programs may appear similar in design, they do offer two alternative career opportunities.

The **Biomedical Electronics** option is a two year program designed to train students in the technical aspects of the equipment used in medical and biological applications.

The **Electrophysiology Clinical** option is a two year program designed to train students in the use of sophisticated electronic and electromechanical equipment to measure biomedical signals in a clinical environment. An example would be the measurement and processing of electroneurophysiologic signals.

Faculty and Staff

A.D. Nichols, B.A.Sc., P. Eng.,
Department Head
M.J. Barrett, Dipl.T., C.E.T.
P.K. Chiu, B.Eng., M.Sc., Ph.D., P.Eng.
N. Fong, B.Sc., B.A.Sc., P.Eng., C.C.E.,
Program Head
R. Gravelle, Dipl.T., C.E.T., Instructor



Biomedical Electronics Programs

Biomedical Electronics Option

Job Opportunities

A biomedical electronics technologist can be employed in a hospital, a clinic, a research lab or in industry. His or her basic capability is to maintain and repair electronic equipment used in medicine and biology. Occasionally this equipment will be used by the technologist to obtain biomedical data to aid physicians in their diagnosis and treatment of disease. Such equipment may include patient monitors, electroencephalographs, defibrillators, electrosurgical units, telemetry devices, analytical, chemical and biochemical instruments, x-ray machines and ultrasound diagnostic and therapeutic units. Some of the servicing may involve mechanical/electro-mechanical devices such as respirators, pumps and opto/electronic instruments. In addition to servicing equipment, the biomedical electronics technologist may also be responsible for the following equipment procedures: inventory control; preventive maintenance programs; specification, evaluation and purchasing; instruction in operation and handling; safety inspections.

As well as the servicing of equipment, job opportunities for biomedical electronics technologists do exist in other areas. A limited number are employed to design and modify equipment for special purpose tasks in research and/or product development. In addition, an increasing number of technologists are employed in the sales departments of various medical equipment supply companies.

The Program

The Biomedical Electronics Program provides education and training in the following subject areas: technical communications; algebra; calculus; statistics; basic, organic and biochemistry; analytical chemistry; human anatomy and physiology; materials science; biophysics; electricity and electronics; biomedical electronics; digital techniques and microprocessor applications. This exposure allows the graduate to work in close association with biomedical engineers, physicians and others who use, maintain, design and supply scientific and medical equipment. During the second year, each student spends four weeks in clinical training, under supervision, in a local hospital, research agency or equipment supply firm.

Throughout the program emphasis is placed on practically-oriented instruction. Authentic "hands-on" laboratory experience is provided and students are trained in engineering problem solving methodology to allow them to upgrade and maintain their knowledge.

A professional attitude is encouraged throughout the program. Membership in the Society of Engineering Technologists (SET) and active participation in the local chapter of the Canadian Medical and Biological Engineering Society (CMBES) is recommended.

The Biomedical Electronics program is nationally accredited by SET. Graduates are eligible for registration as Certified Engineering Technologists (CET's) after two years of relevant work experience following graduation.

Prerequisites

High School graduation from the Selected or Combined Studies Program with Algebra 12, Physics 11, Chemistry 11 and a selection/counselling interview with members of the Department. It has been found that those applicants with post-secondary education, or a period of full-time employment after high school graduation, usually obtain maximum benefit from the program.

Course of Studies

Year 1	Term 1	Clrm. Hrs/wk
30.107	General Chemistry	6
31.178	Technical Writing	4
32.178	Basic Mathematics	8
43.151	Electrical Measurements	4
78.100	Electronics Principles and Practice I	7
78.102	Devices & Techniques I	2
	Library and Research	4
		35

Year 1	Term 2	
30.207	Introduction to Organic and Biochemistry	6
31.278	Technical Writing	2
32.278	Calculus, Numerical Methods & Boolean Algebra	8
76.102	Patient Care	1
78.200	Electronics Principles and Practice II	8
78.202	Devices & Techniques II	1
98.202	Human Anatomy and Physiology	6
	Library and Research	3
		35

Year 2	Term 3	
32.378	Statistics	3
33.330	Biophysics	3
43.352	Measurement Principles and Techniques	4
78.300	Electronics Principles and Practice III	6
78.301	Biomedical Electronics I	7
78.310	Digital Principles and Techniques	8
	Library and Research	4
		35

Year 2	Term 4	4A
30.411	Instrumental Analysis Methods for Biomedical Electronics	4
31.478	Advanced Technical Writing	1
41.491	Materials and Lab Workshop	4
43.451	Video Fundamentals	3
78.401	Biomedical Electronics II	6
78.402	Biomedical Electronics Project	3
78.403	Medical Imaging	4
78.410	Digital Systems and Microprocessors	7
	Library and Research	8
		35
78.420	Practical Experience in Biomedical Electronics (5 weeks including seminar week)	35

Most courses taken within the program require successful completion of certain prerequisites. For further information contact the Department Head. An example of the prerequsites in effect at the time of printing is given below (subject to change):

Course	Course Name	Prerequisite(s)
Term 2		
30.207	Introduction to Organic and Biochemistry	30.107
31.278	Technical Writing	31.178
78.200	Electronics Principles and Practice II	78.100
78.202	Devices and Techniques II	78.102
Term 3		
78.300	Electronics Principles and Practice III	78.200 43.251, 78.202
78.301	Biomedical Electronics	78.200, 78.202, 43.251, 98.202
78.310	Digital Principles and Techniques	78.200, 78.202, 43.251, 31.278
Term 4		
30.411	Instrumental Analysis Methods for Biomedical Electronics	30.207
31.478	Advanced Technical Writing	31.278
43.451	Video Fundamentals	78.300, 78.310
78.401	Biomedical Electronics II	78.300, 78.301, 78.310
78.402	Biomedical Electronics Project	78.300, 78.301, 78.310
78.403	Medical Imaging	78.300, 78.301, 98.202
78.410	Digital Systems and Microprocessors	78.300, 78.310
78.420	Practical Experience in Biomedical Electronics	Successful completion of all components of the program prior to the practicum.

Electrophysiology Clinical Option

Department of Health Engineering Services

Modern hospitals and health care clinics require the services of trained technologists to operate sophisticated electroneurophysiological testing equipment and other related biomedical equipment. In order to understand the operation of this equipment the graduate will have studied mathematical, physical science and engineering subjects. Course work in the basic health sciences will inform the student about human physiology and the biological signals to be measured. In addition, course work in the social sciences will prepare the student for interpersonal relationships with the clinical environment. Extensive clinical experience is built into the program to ensure that the student develops the necessary practical skills in the work environment.

Job Opportunities

Graduates of the Electrophysiology Program will find employment in hospitals or private clinics in the following fields: electroencephalography (electrical activity of the brain), electromyography (electrical activity of the neuro-muscular system), cardiology (electrical and mechanical activity of the heart), and evoked potentials (activities generated by stimulation of the neuro otologic system) which include electronystagmography, electroretinography, electrooculography and visual evoked response.

Graduates will principally find employment in the Neurophysiology Departments of hospitals. In addition to performing a wide variety of tests on patients, the graduate will be expected to evaluate the results in order to assess the performance of the test equipment. Where necessary, tests will be repeated if an equipment/patient interface problem is identified. In addition to an ongoing evaluation of performance, the graduate will perform quality control procedures on equipment and simple calibration/maintenance functions.

The Program

The program is a combination of lab and lecture instruction at BCIT and clinical experience in the Neurophysiology Departments of local hospitals.

The first year of the program is essentially the same as first year Biomedical Electronics. Electrophysiology students and Biomedical Electronics students take their classroom and lab instruction in the common subjects together.

In the fall term special courses in Electrophysiology, Digital Techniques, Medical Terminology, Neuroanatomy and Neurophysiology will train students in the basics of biological signal measurement and clinical apparatus. In the spring term (20) weeks different areas of clinical experience will be covered: electroencephalography; audiology; opthamology (and other evoked potentials); cardiology; and other clinical areas that might include cardiac perfusionry and diagnostic vascular labs.

Upon successful completion of the two year program the student will receive a National Diploma of Technology in Electrophysiology. After a period of work experience in a clinical situation the student will become eligible to write the National Certification Examinations of the appropriate certifying body of their chosen field of interest.

It is expected that a few students will undertake a double-diploma in both Biomedical Electronics and Electrophysiology. This would be a desirable qualification for small hospitals where the workload in either field could not justify hiring a full-time technologist.

Prerequisites

High school graduation from the Selected or Combined Studies Program with Algebra 12, Physics 11 and Chemistry 11. Individuals wishing to enter this new and growing field should be interested in the welfare of people, and should have an aptitude for physics and things electrical and mechanical.

Course of Studies

Year 1	Term 1	Clrm hrs/wk
30.107	General Chemistry	6
31.178	Technical Writing	4
32.178	Basic Mathematics	8
43.151	Electrical Measurements	4
78.100	Electronics Principles and Practice I	7
78.102	Devices & Techniques I	2
	Library and Research	4
		35

Year 1	Term 2	
30.207	Introduction to Organic and Biochemistry	6
31.278	Technical Writing	2
32.278	Calculus, Numerical Methods & Boolean Algebra	8
76.102	Patient Care	1
78.200	Electronics Principles and Practice II (a)	8
78.202	Devices & Techniques II	1
98.202	Human Anatomy and Physiology	6
	Library and Research	3
		35

Year 2	Term 3	
*subject to change		
78.300	Electronics Principles and Practice III	6
78.301	Biomedical Electronics I	7
78.310	Digital Principles and Techniques	8
78.350	Electrophysiology	7
80.378	Medical Terminology	2
98.312	Neuroanatomy and Neurophysiology	2
	Library and Research	3
		35

Year 2	Term 4	
78.450	Clinical Experience in Electrophysiology	35

Most courses taken within the program require successful completion of certain prerequisites. For further information contact the Department Head. An example of the prerequisites in effect at the time of printing is given below (subject to change):

Course Prerequisites

Course	Course Name	Prerequisite(s)
Term 2		
30.207	Introduction to Organic and Biochemistry	30.107
31.278	Technical Writing	31.178
32.278	Calculus, Numerical Methods and Boolean Algebra	32.178
43.251	Electronics Principles and Practice II(b)	78.200
78.200	Electronics Principles and Practice II(a)	78.100
78.202	Devices and Techniques II	78.102
Term 3		
78.300	Electronics Principles	78.200
78.301	Biomedical Electronics I	78.200, 76.102, 98.202
78.310	Digital Principles and Techniques	78.200, 31.278
78.350	Electrophysiology	76.102, 78.200, 98.202
Term 4		
78.450	Clinical Experience in Electrophysiology Successful completion of all components of the program prior to the practicum.	

Subject Outlines

30.107, 30.207 General Chemistry — This course covers basic general chemistry, electrochemistry and an introduction to organic chemistry, including the naming, properties and reactions of the major classes of organic compounds, as well as an introduction to biochemistry, including the nature and metabolism of carbohydrates, fats and proteins. Lab work consists of quantitative analysis, both gravimetric and volumetric, techniques and syntheses in organic chemistry and some biochemical techniques frequently encountered in the clinical lab.

30.207 See 30.107

30.411 Instrumental Analysis Methods for Biomedical Electronics — This course introduces basic theoretical concepts, instrument components and operation and general application of the following methods: potentiometric absorption, flame absorption and emission, fluorescence, gas and liquid chromatography and automated analysis.

31.178, 31.278 Technical Writing — The basics of English are briefly reviewed and tested in a series of directed self-study lessons. The theory and practice of effective letter writing are thoroughly covered, culminating in an intensive examination of the principles. Students will practice preparing all the documents needed in the job search; formal and informal reports, with emphasis on the most used forms of technical writing and graphics; and oral reporting, with some emphasis on the use of audiovisual devices.

31.278 See 31.178

31.478 Advanced Technical Writing — Seminar based course applying fundamentals of technical writing to student technical papers for Term 4 courses.

32.178 Basic Mathematics — Linear equations, matrices and determinants with application to mesh circuit analysis; logarithmic and exponential functions with applications to transient and power problems; trigonometry with emphasis on wave-forms, vectors and use of identities; complex numbers and their use in a.c. circuit analysis.

32.278 Calculus, Numerical Methods and Boolean Algebra — A course in calculus, numerical methods and Boolean algebra covering topics with applications throughout the electrical and electronics fields, e.g. the differentiation and integration of algebraic, trigonometric, logarithmic and exponential functions; techniques of integration, partial differentiation, first and second order differential equations; an introduction to numerical methods using the computer to solve problems; an introduction to Boolean algebra concepts which can be applied to digital circuit simplification and design.

32.378 Statistics — This course provides students with a basic knowledge of statistics. Topics include random sampling, measurement and rounding, frequency distributions, measures of central tendency, measures of dispersion, normal distribution, ranks and percentiles. Estimation, central limit theorem, standard errors, confidence intervals, hypothesis testing, null and alternate hypothesis, large sample hypothesis testing, t-distribution, small sample hypothesis testing and non-parametric testing will also be covered. Computer packages will be discussed.

33.330 Biophysics — A study of biophysics covering mechanics, fluids, waves and heat. The emphasis in lectures, seminars and projects is on the application of physics to biological systems.

41.491 Materials and Lab Workshop — Comparative properties of all classes of engineering materials with emphasis on biomedical applications, including metals, plastic materials; adhesives and composite materials; bonding forces in solids, microstructures, plastic deformation and annealing, alloying; heat treatment of steels and non-ferrous metals; polymers, elastomers and organic adhesives; corrosion and aging of materials; interaction of materials with biological tissues; toxicity; reference sources and materials selection. In the laboratory workshop students will be instructed in the use of hand and bench tools; soldering, brazing, welding and adhesive bonding; basic glass-working; sheet metal working and compression fittings.

43.151 Electrical Measurements — Safety in electrical measurement techniques is emphasized throughout this course. **Topics**: error % and prediction, standards and calibration, device testing, analog and pulse signals, electrical noise, earthing, understanding service manuals. **Equipment used**: analog and digital meters, function and signal generators, bridges, frequency counters, curve tracers, oscilloscopes and attachments.

43.352 Measurement Principles and Techniques — An orientation course covering basic devices for measuring pressure, temperature, density and flow. A study of the principles of analysis instruments, using potentiometric, amperometric and polarographic techniques; ultraviolet, visible and infrared spectroscopy; flame photometry; paper and column chromatography; electrophoresis and refractometric methods. Concept of regulation and feedback control.

43.451 Video Fundamentals — An introductory course covering the basic principles of video display. Topics include raster scan, industrial composite video signals, character generation, video projects.

76.102 Patient Care — This course 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.

78.100 Electronics Principles and Practice I — This course provides students with the basic knowledge of electrical quantities, their units and relationship. The course includes dc circuit analysis techniques for R, RC, RL and RLC circuits; ac circuit analysis for R, RC, RL circuits. Examples of applications to biomedical

electronics are included. Lab exercises are coordinated with course content.

78.102, 78.202 Devices and Techniques I, II — A lab/lecture course designed to introduce the student to various electrical/electronic devices. In addition, various techniques in circuit construction, fabrication, operation, testing and troubleshooting are explained. Course includes an introduction to the various test equipment in the program.

78.200 Electronics Principles and Practice II — Analyzes the properties of passive RLC circuits and introduces basic active devices and integrated circuits. Topics include RLC resonant circuits, bipolar transistor and FET fundamentals, discrete amplifier circuits (single and multistage), amplifier stability, bootstrapping, Miller effect, power amplifiers, oscillators, power supplies, regulators, IC regulators, differential amplifiers, and operational amplifiers.

78.202 See 78.102

78.300 Electronics Principles and Practice III — This course covers advanced topics such as tuned amplifiers, integrated circuit components and the use of various other semiconductor components, e.g. Op Amp, FET, SCR and so on. Included is an introduction to Video Circuitry. Lab exercises are coordinated with course content.

78.301 Biomedical Electronics I — This course introduces students to some basic properties of biomedical signals, various types of transducers used in the biomedical environment and requirements and problems encountered in the processing and display of biomedical signals. Lab exercises are coordinated with course content.

78.310 Digital Principles and Techniques — A study of techniques basic to digital equipment, and their application in communications, instrumentation and industrial control systems. Topics include switch and relay control; number systems; Boolean algebra; codes and coding; solid state logic (TTL, CMOS, HTL); noise and loading; encoders, decoders, display generators, relay drivers and delay devices; counters, shift registers and arithmetic systems; LSI and VLSI digital systems; NMOS, CMOS, ECL, Schottky ITL circuits, A/D and D/A conversion, multiplexing, time and frequency measurement and frequency synthesis.

78.350 Electrophysiology — The following areas will be covered: theory and operation of EEG equipment and its use, telemetry and EEG; theory and operation of equipment related to ECG, echocardiograms, phonocardiograms and stress testing; monitoring and evaluation of implanted pacemaker performance; theory and operation of non-invasive techniques to assess patients for blood vessel disease; theory and operation of EMG equipment and its use; theory and operation of equipment related to ERG, EOG, VER, and CVA (color vision assessment) theory and operation of ENG related to equipment; related important clinical tests for the above equipment; and ultrasonics.

78.401 Biomedical Electronics — This course introduces students to the various types of electronic equipment used in the biomedical environment. Selected equipment types are covered in detail — patient monitoring, cardiac resuscitation, EEG, electrosurgical, telemetry and nuclear medicine equipment. General and specific electrical safety considerations are also included. Lab exercises are coordinated with course content.

78.402 Biomedical Electronics Project — Students are taught proper fabrication methods, including printed circuit design. Two projects will be created, including a design of the students choice (from a sample of practical biomedical circuits). (subject to change)

78.403 Medical Imaging — This course introduces the concepts involved in imaging systems use in medicine. Equipment examined includes X-ray, nuclear medicine, ultrasound, etc.

78.410 Digital Systems and Microprocessors — This course expands the student's basic digital knowledge into microprocessor hardware (8080/8085) and systems. The course also introduces students to assembler level programming. Topics include: microprocessor fundamentals, microprocessor/microcomputer system organization, machine language instruction set, assembler programming, interrupts, I/O, subroutines, interrupt I/O, real-time system concepts. Lab exercises are coordinated with course content.

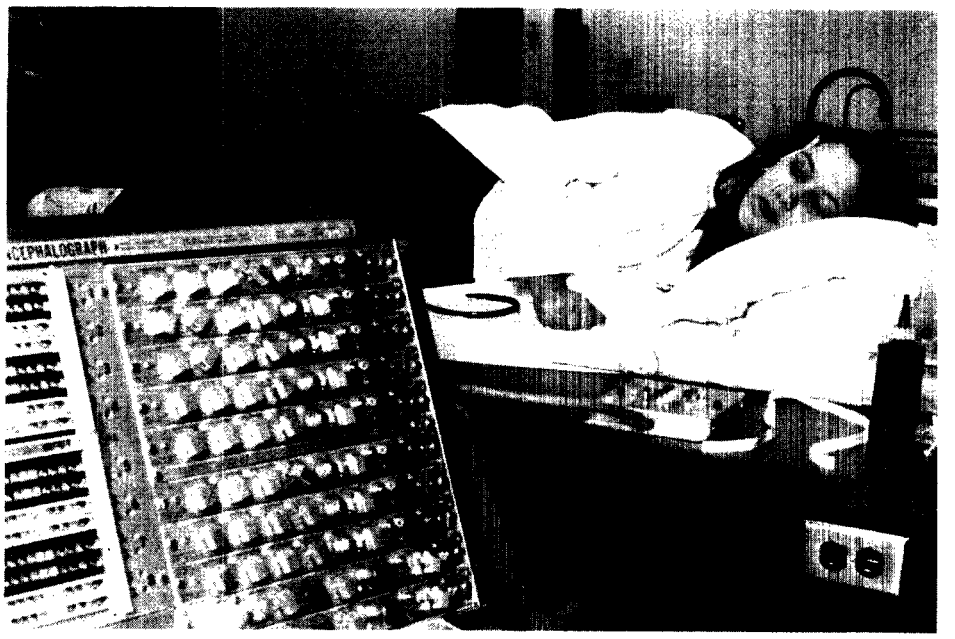
78.420 Practical Experience in Biomedical Electronics — During this period of training students gain practical experience in biomedical electronics and related fields while working, under supervision, at a number of hospitals, research agencies and private companies throughout the province. The work experience portion of this course is four weeks in duration and is followed by one week of student presentations, lectures and seminars at BCIT. The seminar week may include short course work (for credit).

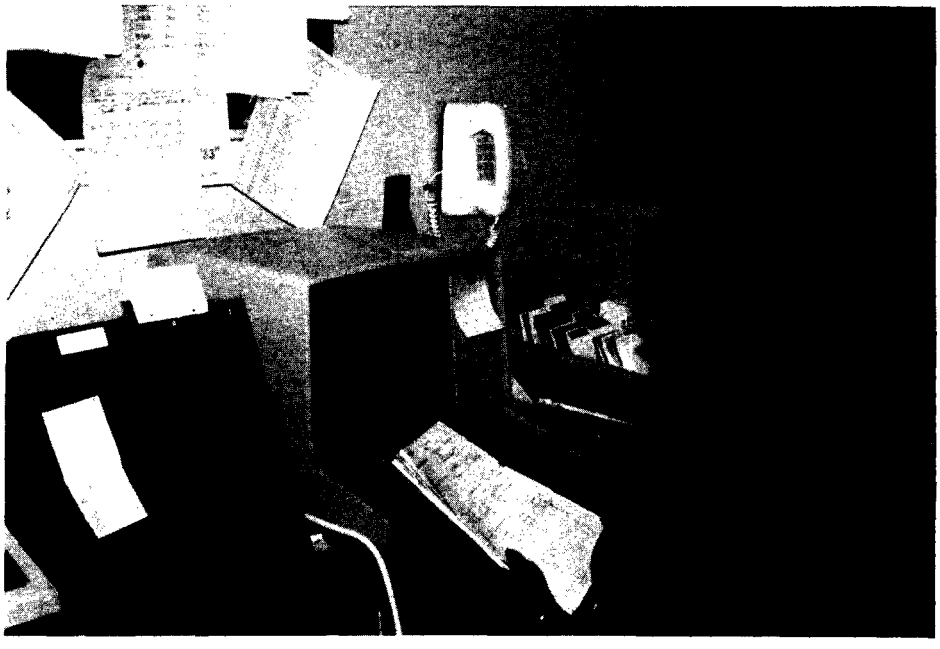
78.450 Clinical Experience — An appropriate amount of time is spent in each of the following clinical areas: EEG; EMG; cardiovascular laboratory; audiology; apthalmology. Program will be tailored to the specific student. Clinical work may be out-of-town.

80.378 Medical Terminology — A study of the medical terminology and concern to medical technologists with regard to patient records.

98.202 Human Anatomy and Physiology — The basic structure and function of the human body is discussed using the systems approach. The cell's role as the unit of structure and function is emphasised. Emphasis is also placed on the regulation of body functions, and the role of control systems in homeostasis. Examples of the uses of biomedical instrumentation in diagnosis and treatment are given.

98.312 Neuroanatomy and Neurophysiology — Reviews the normal anatomy and functions of the brain, and disease states encountered in EEG practice. Also includes the neuromuscular system and nerve condition; the eye, optic nerves and tract; the ear and auditory nerves; fetal development and physiology; and the cardiovascular system.





Health Information Technology

Department of Health Engineering Services

Health Information Technology offers students interested in this important field of health care the advantage of two program options—the Health Record Administrator option and the Health Record Technician option. While the two programs may appear similar in design, they offer two alternative career opportunities.

***Health Record Administrator Option**

This is a **two-year** program designed to train students for management and administration in the health record departments of hospitals and health agencies. Each graduate receives a *Diploma of Technology from BCIT and is* eligible for registration by the Canadian College of Health Record Administrators at the Certificant Level (CCHRA(C)).

***Health Record Technician Option**

This is a **one-year** program designed to train students in the technical aspects of the health record department. Each graduate receives a Certificate of Technology from BCIT and is eligible for registration by the Canadian College of Health Record Administrators at the Associate Level (CCHRA (A)).

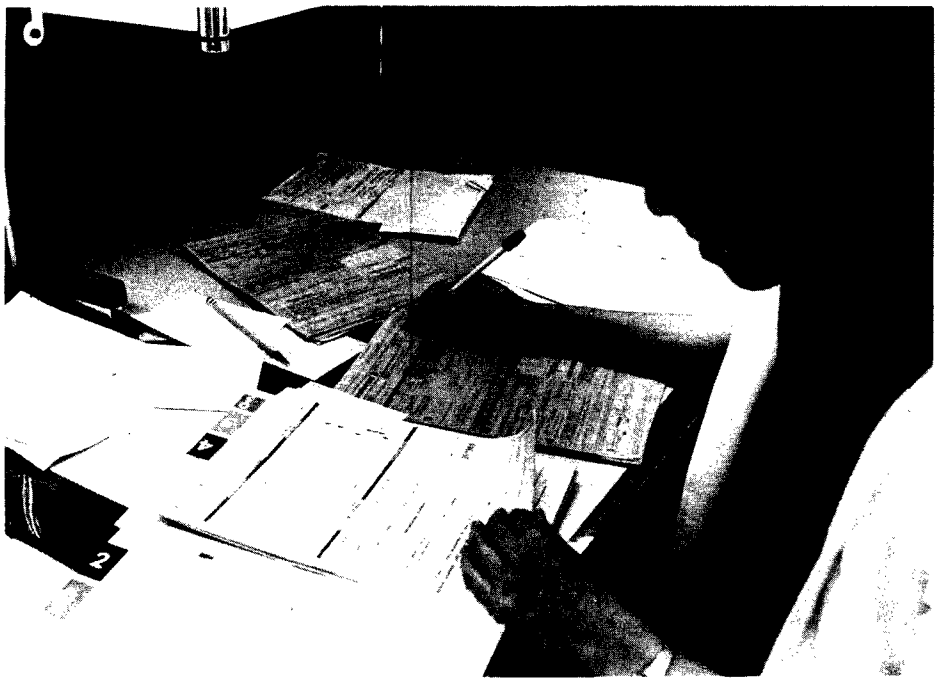
Health Records

Health records are maintained in all health care facilities, and provide a permanent, confidential report of the individual patient's encounter with the health care delivery system. The health record is a complete and accurate document of medical observations concerning health, illness or injury and is an important tool in evaluating the quality of care. As the necessity for accurate documentation in health care grows, computerization is also becoming an important consideration in the recording and utilizing of health information, including the linking of records.

*See following pages

Faculty and Staff

A. Nichols, B.A.Sc., P.Eng., *Department Head*
Ms. E. Gibson, C.C.H.R.A. (C), Program Head
Ms. L. Montgomery, B.H.R.S., CCHRA(C)
Mrs. B. Nelson, C.C.H.R.A. (C)



Health Information Programs

Department of Health Engineering Services

Health Record Administrator

Health record departments of hospitals and health agencies require the specialized services of health information technologists to develop, manage and utilize health information systems. Through the Health Information Technology, BCIT offers students interested in this field a two year program in health record administration.

Job Opportunities

The health Record Administrator can be employed in the hospital health record department, as the director of the department or in a staff position. In addition to the traditional employment in hospitals, other facilities such as community health centres, government agencies and industry may also employ health record personnel to develop, implement and maintain health information systems.

Health record administration is an expanding field. With initiative, today's health information technologist can enter any area in which knowledge of health record standards and systems is necessary. As the use of computers grows, the health information technologist can expect the design, analysis and use of computerized information systems to become an increasingly important part of his/her work.

The Program

In collaboration with the Health Record Association of British Columbia and health care agencies, BCIT has designed the Health Record Administrator Program to provide two years of instruction in the form of lectures, lab exercises and practical experience. In the first year, students concentrate on the basic health sciences and will acquire a fundamental knowledge of health record science. Some practical experience in Lower Mainland hospitals will be provided. In the second year, health record administration, management, organization theory and computer applications will be stressed. During the last term of the program, classroom and lab instruction at BCIT will be supplemented by a ten week practicum in health record departments of local hospitals and various health agencies. Students may incur the costs of travel and living expenses during practicum sessions.

Students are expected to become members of the Health Record Association of British Columbia (HRABC) while attending the program. Graduates will write the national examination of Canadian College of Health Record Administrators (CCHRA) and become Certificant members of the CCHRA. Graduates are expected to continue their professional memberships.

Graduates of this program will be granted a Diploma of Technology. They will possess the skills required to meet today's demand for technologists trained in health record procedures and managerial skills, as well as the needs of the future.

Prerequisites

Graduation from the Selected or Combined Studies Program plus Algebra 12, Biology 12 and proficiency in typing (approximately 50 wpm). Maturity, responsibility and an interest in health care and information management are essential. The work involved demands attention to detail, accuracy, initiative, and effective interpersonal skills.

Course of Studies

	Year 1 Term 1	Tech.	Admin.
31.180	Communication for Health Technologists	4	4
32.180	Statistics	4	4
70.107	Introduction to Clinical Laboratory Procedures	3	3
80.100	Health Record Science	5	5
80.101	Medical Terminology	4	4
80.102	Health Record Practicum	—	6
80.152	Health Record Laboratory	4	—
80.154	Medical and Surgical Transcription I	2	—
98.103	Human Anatomy and Physiology	4	4
98.122	Microbiology	3	3
	Library and Research	2	2
		35	35

	Year 1 Term 2		
14.210	Introduction to Data Processing	3	3
31.280	Communication for Health Technologists	3	3
32.280	Statistics	—	4
76.190	Introduction to Pharmacology	1	1
80.200	Health Record Science	4	4
80.201	Concepts of Disease Processes	4	4
80.203	Health Information Processing	7	7
80.204	Medical and Surgical Transcription I	—	2
80.252	Health Record Practicum	6	—
80.254	Medical and Surgical Transcription II	2	—
98.203	Human Anatomy and Physiology	3	3
	Library Research	2	4
		35	35

	Year 1 Term 2C	
80.253	Health Record Practicum (Five week block practicum in May-June)	35

	Year 2 Term 3	
14.310	Computer Applications I	3
22.380	Management Engineering I	4
70.307	Introduction to Clinical Laboratory Procedures	3
80.300	Health Record Administration	7
80.303	Health Information Processing	8
80.304	Health Record Technological Developments	3
98.337	Organizational Psychology	4
	Library and Research	3
		35

Year 2 Term 4*		
14.410	Computer Applications II	4
22.480	Management Engineering II	4
80.400	Health Record Administration	6
80.403	Health Information Processing	8
80.405	Health Labor Relations	3
80.410	Health Information Practicum	35*
98.415	Genetics	3
98.437	Organizational Psychology	4
	Library and Research	3
		35

*Courses run from January to spring break in March to be followed by 35 hours/week, 10 week practicum from mid-March to end of May.

Students return to BCIT following the practicum until the end of the term for seminars, panel discussions, workshops, field trips and/or short course work (for credit).

Health Record Technician

The health record technician is a highly-skilled member of the health care team. Through the Health Information Technology BCIT has designed a one year program of study for those individuals interested in pursuing this career option.

Job Opportunities

In a small health care facility the health record technician may be fully responsible for the operation of the health record department, i.e. the initiation, development, operation and maintenance of health information systems. In a larger institution the health record technician may specialize in one particular area of work. This includes assembling, and technically evaluating health records according to established standards; compiling various health and administrative statistics; coding and abstracting data from health records according to recognized classification and data collection systems; and maintaining and using a variety of indices, storage and data retrieval systems.

Optimum patient care is of prime importance. The health record technician contributes to this goal, especially in the area of confidentiality. Health record technicians are sensitive to the confidential nature of the information they handle and are trained in the ethics which govern all members of the health care team.

The Program

Lectures, lab exercises and practical experience are combined in the training of health record technicians. Basic health sciences and the fundamentals of health record science are taught in depth. Some practical experience in hospitals in the Lower Mainland will be provided during term 2. Also during term 2, the student will be introduced to health information processing, data processing, department management and supervision as well as continuing some term 1 courses. There is a five week practicum at the end of term 2, in which classroom and lab instruction at BCIT will be supplemented by experience in the health record departments of local hospitals. Students may incur costs of travel and living expenses for practicum sessions.

Students are expected to become members of the Health Record Association of British Columbia (HRABC) while attending BCIT. Upon graduation, students become members of the Canadian College of Health Record Administrators (CCHRA) at the Associate level. Graduates are expected to continue their professional memberships.

Graduates of this program will be granted a Certificate of Technology.

Graduates who wish to become health record administrators may do so in a number of ways, such as completing certain specified BCIT continuing education courses, or with suitable prerequisites, returning to BCIT for the second year of the Health Record Administrator Option.

Prerequisites

Graduation from the Selected or Combined Studies Program plus Algebra 12, Biology 12 and proficiency in typing (approximately 50 wpm). Maturity, responsibility and an interest in health care and information handling are essential for a successful career in the health information field. The work involved demands attention to detail, accuracy and steadfastness.

Within Health Information Technology, course content presumes successful completion of prior course work. Students will not be allowed to attend courses without passing the prerequisites as listed below. For informational purposes, the following prerequisites are in effect for 1983-84, subject to change. For further information consult the course outline.

Course Prerequisites

Year 1 Term 2		
31.280	Communication for Health Technologists	31.180
32.280	Statistics	32.180 (HRA)
76.190	Introduction to Pharmacology	80.101
80.200	Health Record Science	80.100
80.201	Concepts of Disease Processes	80.101, 98.103, 98.122, 70.107
80.203	Health Information Processing	32.180, 80.100, 80.102 (HRA)
80.204	Medical and Surgical Transcription I	80,100, 80.101 (HRA)
80.254	Medical and Surgical Transcription II	80.154 (HRT)
Year 2 Term 3		
14.310	Computer Applications I	14.210
80.300	Health Record Administration	80.200
80.303	Health Information Processing	80.203
80.304	Health Record Technological Developments	80.204, 14.210
Year 2 Term 4		
14.410	Computer Applications II	14.210
22.480	Management Engineering II	22.380
80.400	Health Record Information	80.300
80.403	Health Information Processing	80.303
80.405	Health Labor Relations	80.300
98.437	Organizational Psychology	98.337

Subject Outlines

14.210 Introduction to Data Processing — Presents data processing principles and their applications to health information. Computer terminology, elementary programming, flowcharting, and systems design concepts are presented. Input, output and storage devices; computer languages; and concerns for data accuracy and security are also discussed.

14.310 Computer Applications I — Introduction to computer systems design with particular emphasis on medical applications. Students participate in the design of computer systems using magnetic disk and magnetic tape and learn to effectively communicate their information needs to data processing specialists.

14.410 Computer Applications II — The objectives and components of health information systems are examined from various perspectives: types of systems, reasons for computerizing health information, and the role of the health record administrator in the needs assessment, analysis, design, and management of health information systems. The evaluation and selection of hardware and software are also discussed.

22.380 Management Engineering I — Presents management principles related to the health care industry in such areas as health care financing, a systems approach to health care, organizational structure, planning, organizing, directing and controlling.

22.480 Management Engineering II — A continuation of the scientific principles of management as applied to work improve-

ment and innovation in health care including problem solving, data collection and analysis; methods of work measurement and work sampling techniques; and implementation strategies.

31.180, 31.280 Communication for Health Technologists — An introduction to the general principles of effective written and oral communications as they relate to the work performed by health record technicians and administrators.

31.280 See 31.180

32.180 Statistics — Presents definitions and terminology relating to statistics and research. Also covered are the basic principles of descriptive statistics (measure of central tendency, variance, standard deviation, frequency distribution); the construction of tables and graphs; the calculation of ratios and percentages; and the sources of statistical data.

32.280 Statistics — This course, for students in the health record administrator option only, covers the principles of inferential statistics—sampling techniques, normal distribution, inference on population means and proportions, survey design. It also includes principles of research and epidemiology as related to the health sciences.

70.107 Introduction to Clinical Laboratory Procedures — An introduction to clinical lab procedures in the fields of clinical chemistry, urinalysis, hematology, histotechnology and immunohematology for the purpose of interpreting lab reports in reference to documentation requirements and evaluation of patient care.

76.190 Introduction to Pharmacology — Designed to familiarize the student with common drugs and acceptable abbreviations used in the health field. The legal implications of drug usage are discussed as well as documentation requirements and procedures.

80.100, 80.200 Health Record Science — The first year course provides students with knowledge and practice in the fundamental principles and procedures of health record science. After an orientation to the program and the profession, areas studied in the first term include a detailed examination of all aspects of the health record from formation to completion including numbering and filing systems; microfilming, record retention; hospital accreditation; interdisciplinary relations and intrahospital organization. Emphasis is on confidentiality and release of health information. The second term incorporates a more detailed analysis of the profession, legal aspects of health records, the Canadian health care delivery system, and an introduction to management and supervision of a health record department.

80.101 Medical Terminology — An introduction to the language of medicine. Basic rules of medical terminology, medical abbreviations, medical specialties, hospital services, and hospital statistical definitions are included, along with a detailed study of medical prefixes, stems and suffixes, with emphasis on analysis and word-building.

80.102 Health Record Practicum — An opportunity for students in the health record administrator option to gain practical experience in the basic clerical and technical tasks performed in a health record department. This course coordinates with 80.100 Health Record Science and is conducted in the health record departments of local hospitals.

80.152 Health Record Laboratory — An opportunity for students in the health record technician option to gain practical experience in the basic clerical and technical tasks performed in a health record department. This course coordinates with 80.100 Health Record Science and is conducted in a simulated health record department on campus.

80.154 Medical and Surgical Transcription I — Transcription practice with medical, obstetrical, pathological and surgical reports, including an introduction to the electronic typewriter with limited memory capacity, as well as an introduction to word processing. The emphasis is on accuracy of transcription and increasing facility with electronic equipment.

80.200 See 80.100

80.201 Concepts of Disease Processes — An introduction to the concepts of pathophysiology. Common diseases for each body system are studied in detail, including medical and surgical treatments, according to body systems. Diseases studied will be correlated with patient records in laboratory assignments.

80.203 Health Information Processing — This course deals with data collection, analysis, and presentation. Topics include classification systems, information systems (with emphasis on HMRI and PAS), data quality control, statistical formulae for health information, and an introduction to quality assurance. Labs consist of practice in coding and abstracting and in the retrieval and presentation of data from PAS and HMRI printouts.

80.204 Medical and Surgical Transcription I — See 80.154

80.252 Health Record Practicum — An opportunity for students in the health record technician option to gain practical experience in the basic clerical and technical tasks performed in a health record department. This course is conducted off-campus in the health record departments of local hospitals.

80.254 Medical and Surgical Transcription II — A continuation of 80.154, stressing increased production. A major project concerned with the implementation and evaluation of word processing services in the health record department is included with continuing experience on word processing equipment.

80.300, 80.400 Health Record Administration — These second year courses emphasize the problem-solving approach to certain aspects of health record science and health record department administration. Areas of advanced study include specialized hospitals (patient records, statisics and accreditation), the problem oriented record, medicolegal and ethical aspects, the health care delivery system and the health record profession. Health record policies, procedures and forms design; health record linkage; office space and environmental planning; and administration of the Admitting Department are also studied.

80.303, 80.403 Health Information Processing — These courses emphasize the compilation and use of data for quality assurance and risk management activities. After a detailed examination of principles and practices associated with these topics, students apply the theory to various patient care committees as well as to the functions of a health record department, particularly those functions relating to the collection and analysis of health information.

80.304 Health Record Technological Developments — Examines the technological advances found in health record departments today. Some of the "office of the future" areas discussed include computerized coding and abstracting, computerized CR/ADT, electronic mail and advances in word processing. Emphasis is on implementation and evaluation of these systems.

80.400 See 80.300

80.403 See 80.303

80.405 Health Labour Relations — A discussion of the development of labour relations in the health care environment, with detailed study of the basic principles of union practices, the application of certain labour contracts, the grievance procedure, and the collective bargaining process.

80.410 Health Information Practicum — Practical experience in the health record departments of general and specialized hospitals and other health facilities under the supervision of the director of health record services and a faculty member. After orientation to the clerical and technical duties, emphasis is placed on providing practice and instruction in the duties commonly performed by a health record administrator. All courses must be successfully completed prior to participating in this practicum.

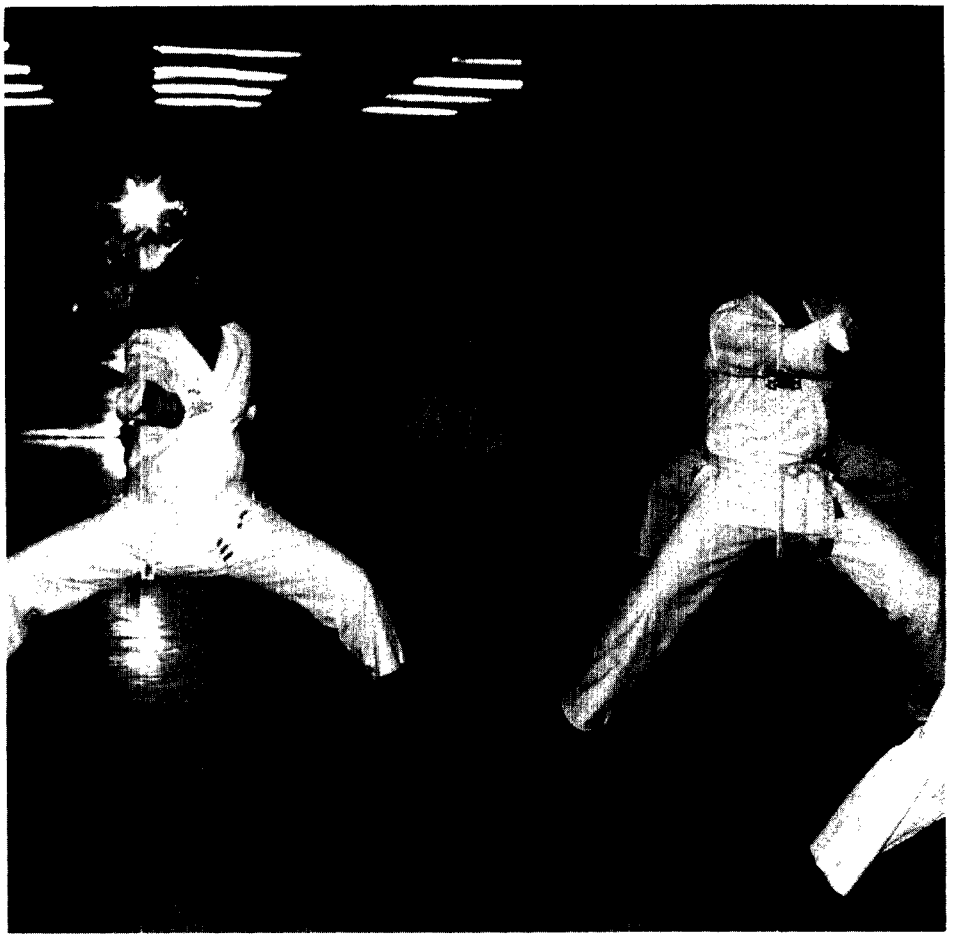
98.103, 98.203 Human Anatomy and Physiology — Provides students with an understanding of normal body structure and function and relates this knowledge to various aspects of the work performed by health record technicians and administrators. Topics include coding and abstracting, data collection for evaluation of patient care, and specification of documentation requirements in the health record.

98.122 Microbiology — Covers the basic characteristics of various types of microorganisms that cause disease in humans. The concepts of communicability and host resistance are included and related to nosocomial infections.

98.203 See 98.103

98.337, 98.437 Organizational Psychology — A study of organizational psychology as it pertains to health care organizations. Emphasis is placed on providing knowledge and skills that enable the health record administrator to communicate, supervise and evaluate the health records work situation.

98.347 See 98.337



Prosthetics and Orthotics

Department of Health Engineering Services

Prosthetists and orthotists help people who have become disabled or who were born with physical defects by fitting them with artificial limbs or supports. The prosthetist designs, constructs, and fits artificial limbs, while the orthotist designs, constructs, and fits orthopaedic braces and supports. Both work closely with doctors, physiotherapists, and others in rehabilitation medicine. After assessing the needs of a patient, the prosthetist or orthotist may assemble the components of an artificial limb or support, or may develop specifications for its construction by a technician. The device is then fitted and adjusted to the patient. From time to time, repairs and maintenance work must also be done.

Job Opportunities

Prosthetists and orthotists work in rehabilitation hospitals and ambulatory care services, in special treatment facilities such as arthritis centres, and in private practice. Many are employed by the Department of Veterans' Affairs. Starting salaries are about $18,000 per year, rising to about $25,000 after certification.

The Program

The two year course of studies will combine lectures, labs and practical experience in local health agencies. The curriculum will equip the graduate to recognize patient problems, assess individual needs, design and construct appliances, select appropriate materials and deal with the emotional difficulties of patients. Graduates will also have a thorough understanding of the required business procedures.

The Prosthetics and Orthotics Program is jointly funded by three western Canadian provinces: B.C., Alberta and Saskatchewan. Applications are accepted on a pro-rated basis from each of the three provinces. For further information please contact the Department Head, Health Engineering Services Department.

The next intake of students is set for September, 1984. At that time, subject to funding, a yearly intake of ten students is anticipated.

Post-graduation

After three year's work experience under the guidance of a certified orthotist or prosthetist, graduates may write the national certificate examination of the Canadian Board of Certification for Prosthetists and Orthotists.

Prerequisites

Graduation from the Selected or Combined Studies Program with Algebra 12 and Physics 11. Metalwork and woodwork courses are recommended. Applicants should have a good academic background, manual dexterity, mechanical aptitude and good interpersonal skills. Patience and inventiveness are of considerable importance.

Expenses

In addition to tuition fees, students will need approximately $600 for textbooks and supplies for the two year program. Students are also responsible for costs of travel to and from agencies where practicums are held, and should be prepared to purchase certain small hand tools.

Course of Studies

		Clrm hrs/wk
Year 1	**Term 1**	
31.184	Technical Writing	3
32.184	Mathematics	4
33.121	Biomechanics I	4
49.184	Shop Practice	3
98.110	Anatomy & Physiology (Systems)	4
84.100	Prosthetics & Orthotics I	14
	Library and Research	3
		35

		2A	**2B**
Year 1	**Term 2**		
31.284	Technical Writing	3	3
32.284	Mathematics	2	2
41.284	Materials	2	2
76.206	Introduction to Patient Care	—	3
84.200	Prosthetics & Orthotics II	13	13
84.220	Biomechanics II	2	—
98.210	Anatomy & Physiology (Systems)	2	2
98.211	Anatomy & Physiology (Regional)	3	3
98.242	Behavioral Science	3	3
	Library and Research	5	4
		35	35
84.202	Practicum — 3 weeks		35

Year 2	**Term 3**	
78.384	Electronics Circuits	8
84.300	Prosthetics & Orthotics III	15
84.320	Biomechanics III	2
98.310	Pathology & Pathophysiology	3
98.311	Anatomy & Physiology (Regional)	2
	Library and Research	5
		35
84.302	Practicum — 3 weeks	35

Year 2	**Term 4**	
10.005	Management 1	3
84.400	Prosthetics & Orthotics IV	24
84.410	Patient Assessment & Care	3
	Library and Research	5
		35
84.402	Practicum — 5 weeks	35

Within Prosthetics and Orthotics Technology, course content presumes successful completion of course prerequisites. These course prerequisites are listed on each detailed course outline distributed by the course instructor and are listed below. For further information contact the Department Head.

Course	Course Name	Prerequisite(s)
Term 2		
31.284	Technical Writing	31.184
32.284	Mathematics	32.184
41.284	Materials	49.184
84.200	Prosthetics & Orthotics II	84.100
84.220	Biomechanics II	33.121
98.210	Anatomy & Physiology (Systems)	98.110
98.211	Anatomy & Physiology (Regional)	98.110
84.202	Practicum	84.200, 84.220, 98.210, 98.211
Term 3		
78.384	Electronic Circuits	32.284
84.300	Prosthetics & Orthotics III	84.202
84.320	Biomechanics III	84.202
98.310	Pathology & Pathophysiology	98.210
98.311	Anatomy & Physiology (Regional)	98.211
84.302	Practicum	84.300, 84.320, 98.310, 98.311
Term 4		
84.400	Prosthetics and Orthotics IV	84.302
84.410	Patient Assessment & Care	84.302
84.402	Practicum	84.400, 84.410, 10.303

Subject Outlines

10.005 Management Fundamentals — The objective of this course is to give students 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.

31.184, 31.284 Technical Writing — Through a series of lectures and projects, students improve their ability to express themselves clearly and appropriately to patients and their families, to other health care professionals, and to such groups as government and fee-paying agencies. Topics include: basic skills in writing instructions, memorandums, letters, and reports; general medical terminology; and effective public speaking. Library orientation and research techniques are also emphasized.

31.284 See 31.184

32.184, 32.284 Mathematics — Students are provided with a solid grounding in the mathematical elements essential to their work. The course includes graphs and functions, systems of linear equations, trigonometry, and complex numbers. Wherever possible, alternative methods of solution are suggested to encourage creativity in problem solving. Students are provided with enough background material to pursue more advanced investigation of specialized areas of their technology.

32.284 See 32.184

33.121 Biomechanics I — A general level course with emphasis on the application of physics to prosthetics and orthotics. Topics lie in the general field of mechanics and include, specifically, kinematics, dynamics, statics, simple machines, energy, and fluid mechanics. Measurement and problem solving techniques are stressed. Mathematical treatment requires algebra and trigonometry.

41.284 Materials — This course provides a basic coverage of the structures, properties, and applications of common engineering materials with emphasis on those used in prosthetic and orthotic devices. Concepts such as tensile and yield strength, fatigue, hardness, and deformation will be explored both in theory and in the testing laboratory. The aim is to provide an appreciation of the materials which are, or may be used in prosthetic/orthotic devices, and to explain at least some of the factors involved in selecting a material for a specific purpose.

49.184 Shop Practice — This course is intended to develop manual skills and to utilize some of the basic machine tools available in most metal-working laboratories. On completion, the student will be able to operate most basic hand and machine tools well enough to produce relatively simple metal projects. Time is also spent on the joining of metals by solder, braze and electric arc.

78.384 Electronic Circuits — The student is introduced to basic and modern electronic principles and utilizes these principles in the operation, building and laboratory testing of control systems. Students become familiar with such concepts as: the basic theory and operation of D.C. and A.C. circuits; techniques in measuring electrical quantities; and the basics of modern electronics used in control systems, including analog and digital control systems. To supplement and implement the theory, strong emphasis is placed on "hands on" training.

84.100 Prosthetics and Orthotics I — Initially, students are oriented to the terminology, general concepts, and devices commonly prescribed in the field. The area of Lower Limb Orthotics is then treated in detail, with the aim being to develop students' competence in the use of the materials, components, and tools commonly used in the construction of ankle-foot and knee-ankle-foot orthoses. Students design, construct and fit a variety of devices, including shoe modifications, from the point of prescription to final evaluation.

84.200 Prosthetics and Orthotics II — The area of Lower Limb Prosthetics is examined in detail. Design principles underlying the patellar-tendon-bearing prosthesis, its variants, and the quadrilateral above-knee prosthesis are analyzed. Students design, construct, fit, and align a variety of prostheses for below-knee and above-knee 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.

84.202, 84.302, 84.402—Practicum — The student is given the opportunity to apply his/her knowledge of design principles and fitting procedures to a variety of patients under the supervision of a practicing prosthetic or orthotic clinician. Participation in clinical activity and discussion of unusual fitting problems are encouraged. Specific projects aimed at amplifying work done in the Prosthetic and Orthotic courses are required.

84.300 Prosthetics and Orthotics III — Lower Limb Prosthetics is completed with the treatment of, first, Symes and partial foot prosthesis and, second, hip disarticulation prosthesis. The area of Upper Limb Orthotics is then examined. While the emphasis again is on the principles of design and alignment, each student will construct and fit a variety of devices, both to apply the appropriate principles and to gain familiarity with the tools, materials, and components currently in use.

84.302 See 84.202

84.400 Prosthetics and Orthotics IV — The area of Spinal Orthotics is covered, from the principles involved in fitting a corset, to the construction of a CTLSO, Milwaukee type. Biomechanical principles and fitting guidelines will be emphasized more than construction techniques. The area of Upper Limb Prosthetics is then explored. Students become familiar with the components and socket designs commonly used for different levels of amputation, and fit a variety of upper limb prostheses. Towards the end of this course, the topics of external power in Upper Limb Prosthetics and Orthotics is examined, with students fitting various myoelectric or switch-controlled devices.

84.402 See 84.202

84.410 Patient Assessment and Care — A series of presentations and projects help students learn how to evaluate patients from the viewpoint of functional loss, select appropriate devices to restore function, and design solutions to specific needs not met by available componentry. Basic principles and procedures for handling the disabled are also covered.

84.420 Biomechanics — Force tolerance and mobility of the skeletal system are examined in some detail to determine the functional loss associated with various physical disorders or amputations, and the

residual function upon which a prosthesis or orthosis can be based. The effect of pressure on soft tissue is also explored. Various prostheses and orthoses are analyzed from the viewpoint of the mechanical forces at work and their effect on the disabled person.

98.110, 98.210 Anatomy and Physiology — The aim of this course is to make the student knowledgeable about the composition and functions of the human body, with emphasis on the nervous, muscular and skeletal systems. Functional anatomy of the musculo-skeletal system is treated in detail. Emphasis is also placed on growth and aging processes.

98.210 See 98.110

98.242 Behavioral Science — In a series of lectures, discussions and planned experiences, students are given a greater understanding of how various people react to physical loss or illness, and of the role to be played in assisting the handicapped to reintegrate into society. Topics include: the psychology of being ill; understanding stress behavior; pain management; interpersonal communication; adjustment in self-image; the disabled person in society; and relationships among health care professionals.

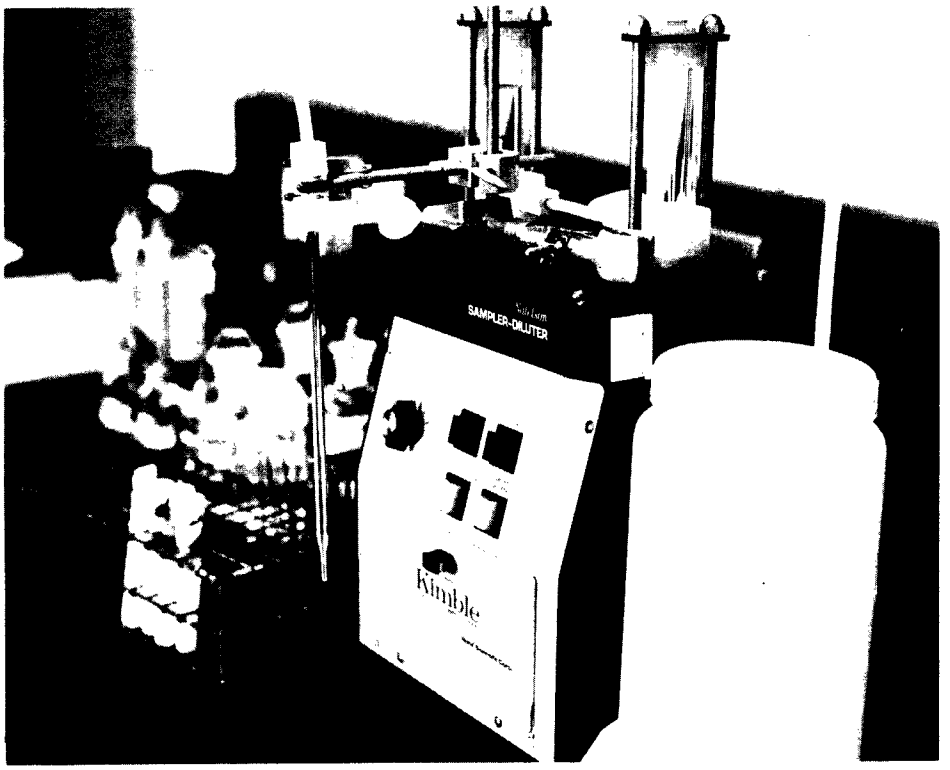
98.310 Pathology and Pathophysiology — Students explore basic concepts of the disease process, and the nature of the various disorders they are most likely to see in their prosthetic/orthotic practices. Topics such as cellular injury and death; trauma; inflammation; and healing are covered. Specific disorders include bone, joint and muscle pathologies; neurological and hemodynamic disorders; metabolic and congenital abnormalities; and neoplasia.

Faculty and Staff

A.D. Nichols, B.A.Sc., P.Eng., *Department Head*

I. Dyck, C.P (C)

Wm. J. McGuinness, M.A., C.P.O., Program Head



Medical Laboratory

Department of Medical Laboratory Services
The medical laboratory technologist, as a member of the health team, performs the many and varied laboratory procedures which are used by physicians as important aids to the diagnosis and treatment of the patient. Laboratory screening programs are being developed to alert the physician to disease processes which, though not yet clinically evident, are nevertheless present in the patient. Automation, instead of decreasing the need for the medical laboratory technologist, has created a demand for more highly trained technologists. The increasing use of sophisticated new lab procedures and the rising demand generally for health services assures a wide range of employment opportunities.

Job Opportunities
Medical laboratory technology offers a variety of scientific pursuits within the modern hospital, the private clinic and the research laboratory. These fields include histotechnology, clinical chemistry, hematology, microbiology and immunohematology. The trained technologist may pursue any one or a combination of these fields after completion of training.

The Program
An academic, science-oriented first year is followed by a didactic second year, during which the five disciplines within medical technology are studied in depth. Students spend these two years at BCIT and a third and final year of training in a medical laboratory approved conjointly by the Canadian Medical Association and the Canadian Society of Laboratory Technologists. At the end of this year, the student is eligible to take the Canadian Society of Laboratory Technologists examination which leads to the Registered Technologist, the recognized qualification for working as a technologist in a medical laboratory.

Prerequisites
Graduation from the Selected or Combined Studies Program with Algebra 12 (or Math 12 if completed before 1978), Chemistry 11 and 12 and Physics 11. Preference will be given to those students who have also successfully completed Biology 12. Applicants should have a strong interest in science and be meticulous in their work habits. Color blindness precludes admission.

Course of Studies

Year 1	Term 1	Clrm hrs/wk
30.105	General Chemistry for Medical Laboratory Technologists	6
31.170	Communication	4
32.170	Mathematics for Medical Laboratory Technologists	5
33.110	Physics for Medical Laboratory Technologists	5
70.101	Medical Laboratory Orientation	4
98.101	Human Anatomy and Physiology	4
98.136	Behavioral Science Library and Research	3 4
		35

Year 1	Term 2	Clrm hrs/wk
14.211	Introduction to Data Processing	3
30.205	General Chemistry for Medical Laboratory Technologists	6
32.270	Mathematics for Medical Laboratory Technologists	5
33.210	Physics for Medical Laboratory Technologists	5
70.201	Medical Laboratory Orientation	4
98.201	Human Anatomy and Physiology	4
98.230	Introductory Principles of Immunology	3
	Library and Research	5
		35

Year 2	Term 3	Clrm hrs/wk
70.302	Clinical Chemistry	9
70.303	Hematology	4
70.304	Histotechnology	9
70.305	Microbiology	9
	Library and Research	4
		35

Year 2	Term 4	Clrm hrs/wk
70.402	Clinical Chemistry	10
70.403	Hematology	5
70.405	Microbiology	9
70.406	Immunohematology	8
	Library and Research	3
		35

Subject Outlines

14.211 Introduction to Data Processing — Training in basic data processing principles to develop recognition of the possible application of these principles in industry. The principal functions of data processing will be illustrated and practiced with an H.P. minicomputer operating interactively. Elementary computer programs will be written and tested on the computer. Use of flow-charting and elementary data processing systems design will illustrate the achieving of data processing objectives.

30.105, 30.205 General Chemistry for Medical Laboratory Technologists — This course includes basic inorganic and physical chemical principles, an introduction to organic chemistry and the properties and reactions of the major classes of organic compounds, as well as a selection of biochemical materials such as carbohydrate and fat metabolism, amino acid metabolism, properties of proteins and their synthesis, enzyme action, hormones. Lab work consists of

quantitative analysis, with emphasis on gravimetric and volumetric techniques, organic techniques and synthesis, properties of biological materials, enzyme reactions and physical methods of analysis.

30.205 See 30.105

31.170 Communication — An introduction to the oral and written communications applicable to the health field. Students will be taught the basic skills of effective writing for reports, letters, job applications, resumés and memoranda. Students will also be instructed in the techniques and skills necessary to effectively present an oral report and to function effectively in meetings.

32.170 Mathematics for Medical Laboratory Technologists — Review of basic algebra with applications; functions and graphs; general base and natural logarithms; logarithmic response; logarithmic and exponential functions with applications; use of logarithmic graph paper; limits and slopes; the derivative; differentiation of algebraic functions.

32.270 Mathematics for Medical Laboratory Technologists — Further differentiation; applications of the derivative; max-min problems, rate of change, error computations; integration; area and volume by integration; simple differential equations with application to the medical laboratory; reaction kinetics; mechanical methods of integration; introduction to statistical problems in the lab; descriptive statistics; measures of central tendency and spread; probability; Poisson, binomial and normal distributions; sampling and estimating; the t-distribution; hypothesis testing; comparison of means; linear regression.

33.110, 33.210 Physics for Medical Laboratory Technologists — An introductory level course for the Medical Laboratory Technology, with emphasis on the application of physics within the health fields. Topics covered include kinematics, dynamics, friction, statics, angular motion, energy, momentum, simple machines, properties of matter, fluid mechanics, temperature and heat, basic electricity and magnetism, wave motion and sound, optics and atomic and nuclear phenomena. The lab program stresses the subjects of measurements, data analysis, experimental technique and report writing. Mathematical treatment requires algebra and trigonometry.

33.210 See 33.110

70.101, 70.201 Medical Laboratory Orientation — A critical review of the basic theory and use of various types of microscopes. An introduction to principles and use of precision instruments and equipment pertaining to the clinical lab. The principles and procedures of volumetric analysis and of the preparation and use of buffers. An introduction to the clinical lab as a potentially hazardous environment, with precautions necessary to make it a safe environment.

70.201 See 70.101

70.302, 70.402 Clinical Chemistry — An introduction to the various medical laboratory instruments used in the chemical analysis of biological specimens with emphasis on the principles, components, operation and care of these instruments. The study of protein and related nitrogenous substances—metabolism, function, measurement and relationship to disease states. The physiology of liver, kidney, brain and gastro-intestinal tract. The study of electrolytes, acid-base balance, enzymes, carbohydrates, lipids, urine, gastric juice and cerebrospinal fluid. The measurement of various constituents of body fluids and the association of their levels with pathological conditions. The methods and importance of quality control as applied to clinical chemistry.

70.303, 70.403 Hematology — Consists of a study of the cellular composition of the blood and of the blood-forming tissues with emphasis placed on normal levels and functions. An introduction to abnormal functions and test results is also included. Detailed studies of cell series, both normal and abnormal, in blood and in bone marrow are stressed. The anemias, abnormal hemoglobins, leukemias, certain infectious disorders, coagulation and performance of special test procedures conclude the course.

70.304 Histotechnology — The course is designed to acquaint and familiarize the student with current techniques used in medical lab and to prepare tissue for pathological diagnosis and morphological study. The course deals with concepts and factors affecting tissues from specimen reception to final diagnosis both histologically and histochemically.

70.305, 70.405 Microbiology — An introduction to the principles and procedures of microbiology, including the detailed study of methodology and lab techniques utilized in clinical microbiology and in parasitology.

70.402 See 70.302

70.403 See 70.303

70.405 See 70.305

70.406 Immunohematology — An introduction to the general principles of blood grouping, inheritance of blood groups, immunology, equipment and reagents required. Methodologies with their advantages and limitations, donations and their utilization and blood group systems.

98.101, 98.201 Human Anatomy and Physiology — The course involves a systematic approach to the study of human anatomy and physiology for Medical Laboratory Technology students. This course includes basic cytology and introduction to histology and the skeletal, muscular, nervous, circulatory, respiratory, digestive, urinary and reproductive systems. The primary emphasis is on the physiology of these systems. Basic biochemistry related to each system is also included.

98.136 Behavioral Science — This course presents basic psychological and sociological concepts of health and illness behavior. Emphasis is placed on analytical examination of these concepts.

98.201 See 98.101

98.230 Introductory Principles of Immunology — A basic course designed to give the medical laboratory student encountering immunology for the first time, a general background in this broad field of study. The course deals with body defenses against disease; types of immunity and their physiological characteristics; biologicals used; nature and function of antigens and antibodies; the basic principles and mechanics of "in vitro" immunologic diagnostic tests; hypersensitivities, their characteristics and management; immune deficiency diseases and auto-immunity.

Faculty and Staff

Mrs. M.J. Blair, B.A., A.R.T., *Department Head*
Mrs. W. Basford, R.T.
Mrs. A. Bootsveld, R.T. (on leave)
P. Bradbury, F.I.M.L.S., A.R.T., *Senior Instructor*
Mrs. J. Brechin
F.L. Curtis, F.I.M.L.S., A.R.T.
Mrs. J.B. Davis
Mrs. E.E. Hudon, R.T.
Mrs. M.H. Kyriakidis
Mrs. K.P. MacCulloch, R.T.
Miss L.J. Marshall, A.R.T.
Mrs. K.E. Nicolson, B.Sc., A.R.T.
Mrs. H.A. Pedlar, R.T.
Mrs. J.M. Scriabin, B.Sc. (Hons.), M.Sc., A.R.T, *Chief Instructor*
Mrs. G.M. Sealy, R.T.
L. Simandl, A.R.T.
Mrs. A.J. Striha, A.R.T.
Miss E.A. Whiteside, B.A., R.T., *Senior Instructor*
Miss D. Yarema, B.Sc., R.T.

Medical Radiography

Department of Radiological Technical Services

The medical radiographer is an x-ray Technologist who works as part of a health team composed of radiologists, internists, surgeons, nurses, lab technicians, biomedical technicians and other specialists. X-rays are widely used as an aid in making medical diagnoses. A radiograph (x-ray picture) 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 or brain abnormalities. X-ray technologists work under the direction of a medical specialist (a radiologist), and may work in the hospital x-ray department, at the patient's bedside or in the operating room. Radiographers are also employed in private x-ray clinics. Medical radiography is not a hazardous occupation. The dangers of radiation are well-recognized and rigidly controlled. The conscientious radiographer can derive much personal satisfaction as a contributor to the success of the health team. Medical Radiography is a field suited to both men and women.

Prior to enrolment at BCIT, a one-week orientation period in a hospital x-ray department is required. Arrangements for this orientation will be made by BCIT.

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. In the second year, students spend alternate 2 week periods at BCIT and in a hospital. A third year of in-service training must be completed at one of the participating hospitals (four in the Lower Mainland; two in the Interior; one on Vancouver Island). This additional training is a prerequisite for writing the certification examination set by the Canadian Association of Medical Radiation Technologists.

Job Opportunities

BCIT graduates in medical radiography find employment in hospitals and private clinics. These vary in size, employing from one to thirty-five technicians. Most x-ray technologists work a thirty-five hour week with the usual statutory holidays. Night work and on-call duty may be necessary, depending on the requirements of the department. It is also possible to work outside Canada since certification by the Canadian Association of Medical Radiation Technologists is recognized in the U.K., the U.S.A., and several other countries.

Prerequisites

Graduation from the Selected or Combined Studies Program with Math 12, Algebra 12 or Algebra 12 (Honors), two science 11s and one science 12.* A C+ average in the final year of secondary school is required.

Math 12 is only acceptable if taken prior to 1978

Applicants must have a strong sense of responsibility, an interest in the welfare of others, particularly the sick and injured, and meticulous work habits.

Students must complete an immunization program. A preadmission interview with a member of the Medical Radiography Program staff is conducted to assess the applicant's suitability for this field. Students are expected to be competent in written and oral English.

**Experience has shown that Physics 11 is an advantage.*

Course of Studies

		Clrm hrs/wk
Year 1	**Term 1**	
31.172	Communication	3
32.172	Basic Mathematics of Radiography	4
33.109	Physics of Medical Radiography	5
72.101	Radiographic Technique	4½
72.102	Medical Imaging	3½
98.107	Basic Anatomy & Physiology	6
	Tutorial	1
		27
Year 1	**Term 2A**	
31.272	Communication	2
33.209	Physics of Medical Radiography	5
72.201	Radiographic Procedures I	9
72.203	Radiographic Anatomy & Physiology	6
72.206	Clinical Experience (hospital)	4
76.203	Patient Care	3
	Tutorial	1
		30
Year 1	**Term 2B**	
33.209	Physics of Medical Radiography	5
72.201	Radiographic Procedures I	7½
72.202	Medical Imaging	3½
72.203	Radiographic Anatomy and Physiology	6
72.206	Clinical Experience (hospital)	4
	Tutorial	1
		27
Year 2	**Term 3**	
72.301	Radiographic Procedures 2	9
72.302	Medical Imaging	7
72.304	Emergency Care	1
72.307	Pathology	4

Year 2	Term 3 cont.	Clrm hrs/wk
76.306	Patient Care	6
	Tutorial	1
		28*
72.306	Clinical Experience (hospital)	35*
Year 2	**Term 4A**	
72.401	Specialized Procedures	8
72.403	Radiation Biology	4
72.407	Pathology	4
72.408	Radiograph Evaluation	2
72.409	Quality Control	3
98.427	Microbiology & Epidemiology	3
98.440	Human Behaviour	5
	Tutorial	1
		30*
72.406	Clinical Experience (hospital)	35*
Year 2	**Term 4B**	
72.401	Specialized Procedures	8
72.404	Management and Instructional Skills	4
72.405	Radiation Protection	4
72.408	Radiograph Evaluation	2
72.409	Quality Control	3
72.410	Digital Imaging	4
98.440	Human Behaviour	4
	Tutorial	1
		30*
72.406	Clinical Experience (hospital)	35*

**Alternate two week periods.*

Subject Outlines

31.172, 31.272 Communication — An introduction to the oral and written communications applicable to the health field. Students are taught the basic skills of effective writing for reports, letters, job applications, resumés and memoranda. Students are also instructed in the techniques and skills necessary to effectively present an oral report and to function effectively in meetings.

31.272 See 31.172

32.172 Basic Mathematics of Radiography — Plane geometry, functions and graphs, exponents, common and natural logarithms, exponential growth and decay, log-log and semi-log graphs, trigonometry and sinusoidal functions. Applications of the above topics to radiography and to relevant physics.

33.109, 33.209 Physics of Medical Radiography — An introductory level course which emphasizes the application of physical phenomena in medical radiography. It includes the structural and physical properties of matter, static electricity, direct and alternating current, magnetism, mechanics, energy, wave motion, sound, ultrasound, thermodynamics, optics, quantum concepts, production of x-rays, interaction of x-rays with matter, radioactivity, x-ray tubes, photomultipliers and other detectors of radiation.

33.209 See 33.109

72.101 Radiographic Technique — This course introduces the student to the basic principles of radiography. A study is made of the application of the basic factors in producing a radiograph. Sessions in the x-ray laboratory allow the student to produce radiographs in an experimental setting.

72.102 Medical Imaging — This course introduces students to the standard equipment used in the production of a radiograph. Fundamentals of the photorecording 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. Lab work related to all these subjects is included.

72.201 Radiographic Procedures 1 — Basic radiographic procedures of the upper and lower extremities, vertebrae, thoracic cage and skull are studied. An introductory study is made of the radiography of the digestive, urinary and biliary systems. Five hours each week in the x-ray laboratory allow the student to practice positioning and x-ray the phantoms in the areas covered in class. One hour a week is devoted to radiograph evaluation.

72.202 Medical Imaging — Rectification, control circuits and x-ray tubes comprise the apparatus studied in this course. The image-recording portion covers sensitometry and all aspects of radiographic processing. This includes developers, replenishers, fixers, ancillary chemicals, deep-tank and various automatic processing systems.

72.203 Radiographic Anatomy and Physiology — In the first half of this course a detailed study is made of the human skeleton. In the second half the body organs, glands, vessels and nerves are studied according to region. Throughout the course much attention is given to surface anatomy and the radiographic appearance of structures. Emphasis is placed upon those details of structure and function which are pertinent to radiographic procedures.

72.206, 72.306 Clinical Experience (Hospital) — The student acquires a basic knowledge of medical radiographic techniques by applying classroom and laboratory training in actual clinical situations in the affiliated hospitals.

72.301 Radiographic Procedures 2 — This course represents a continuation of the study of the urinary, digestive and biliary systems introduced in 72.201. The skull is studied in greater detail as are the special techniques related to the skeletal system. Instruction is given in contrast media. The students are able to reinforce the classroom material in the x-ray laboratory. One hour a week is devoted to radiograph evaluation. This course runs concurrently with 72.306.

72.302 Medical Imaging — The equipment used in fluoroscopy, serial, radiography and skull, dental and mobile units is studied. Special imaging equipment —spot cameras, cinecameras, image amplifiers and closed circuit television is also included. Image storage, retrieval and enhancement methods are covered, and some allied medical imaging systems are introduced.

72.304 Emergency Care — Instruction is given in basic first-aid procedures and skills required during an emergency situation where no professional help is present. Instruction is also provided in basic life support procedures that would enable the student to recognize respiratory and cardiac arrest and start proper application of cardio pulmonary resuscitation.

72.306 See 72.206

72.307 Pathology — Students are introduced to pathologic terminology and the basic mechanisms underlying disease processes. The balance of the course deals with pathological conditions of bone.

72.401 Specialized Procedures — The course includes discussion of the specialized radiographic procedures utilized to demonstrate the vascular tree, the central nervous system, and the digestive, biliary and genito-urinary tracts. Also included is a brief discussion of pediatric radiography and C.T. scanning.

72.403 Radiation Biology — The student is reintroduced to the basic interactions of radiation with matter. An in-depth study of intracellular responses to radiation is made. The latter part of this course deals with radiation pathology and human experience with radiation injury.

72.404 Management and Instructional Skills — The management skills portion of the course explores some of the technical skills required for today's medical radiography supervisor. It is intended to complement 98.440 Human Behavior given in terms 4A and 4B. The instructional skills portion of the course presents a broad overview of the teaching/learning process with specific emphasis on clinical teaching skills in order to facilitate maximum student learning through effective student teaching.

72.405 Radiation Protection — The aims and objectives of radiation protection are discussed, as well as the various organizations responsible for establishing protection standards. The course then deals with regulations governing the use of diagnostic radiation and methods of reducing exposure to the patient, the technologist and fellow workers.

72.406 Clinical Experience (Hospital) — This course runs concurrently with 72.401. The student applies more advanced classroom and lab training in a clinical situation.

72.407 Pathology — This course, which follows 72.307, deals with pathological conditions affecting the remainder of the body. The student is also made aware of how pathology will affect technical factors used in the production of a diagnostic radiograph.

72.408 Radiograph Evaluation — A systematic review of the radiographic examinations taught during Radiographic Procedures 1 and 2, is carried out during Term 4. The student evaluates radiographs for positioning, image quality and structures demonstrated.

72.409 Quality Control — This course covers the concepts and application of quality control in the Radiology Department. Emphasis is placed on the significance of quality control in modern radiography. Control of processing machines is stressed. Quality control planning, cost control, reject analysis, machine calibration and various mechanical tests are covered.

72.410 Digital Imaging — This course reviews the basic structure of a computer, the process of attenuation of radiation and then describes the digital processing of various images. The latest clinical application of digital image processing, including NMR, is described. Emphasis is placed on the changing role of the technologist in the near future.

76.203 Patient Care — This course 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.

76.306 Patient Care — This course provides the student with advanced concepts and techniques necessary to meet the comfort and safety measures of patients undergoing x-ray. 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.

98.107 Basic Anatomy and Physiology — This course is a systematic study of the basics of human anatomy and physiology to prepare the student for the course 72.203. Included are basic physiological chemistry, cytology and histology.

98.427 Microbiology and Epidemiology — An introductory course designed to present the student with a basic knowledge of medically important microorganisms; host-parasite relationships; communicability of infection; sources of infection, particularly as they exist in a hospital environment; methods of control, including asepsis and use of destructive agents.

98.440 Human Behavior — This course provides students with social and psychological concepts relating to processes occurring within hospitals, particularly in radiography departments. Professional and ethical considerations, and ways of dealing with common hospital events are explored.

Faculty and Staff

D.W. Martin, B.Sc. (Hons.), M.S.R.,
Acting Department Head
Miss A. McMillen, R.T.
Mrs. M. Moores, B.Sc., R.T.
Miss P.M. Rogers, R.T.
E. Seeram, B.Sc., R.T.
Miss N. Smith, B.A., R.T., Program Head
R.J. Smith, M.S.R., R.T.
Mrs. O.H. Tomasky, R.T.&N.
Mrs. S.G. Williams, R.T.

Nuclear Medicine

Department of Radiological Technical Services

Nuclear medicine is the application of radioactive materials to the diagnosis and management of disease in humans. It is a relatively young diagnostic specialty and one of the most challenging and exciting branches of medicine.

Radioactive atoms are chemically identical to stable atoms of the same species and can be introduced into the basic chemical structure of many compounds. The radiation that is emitted from the radioactive atoms in the compound permits the detection and measurement of the compound even within the human body. This provides a means of investigating normal and abnormal functions of specific chemical and physiological processes within a human being while those processes are going on. Virtually all physiological processes within the body are now measurable and can be "seen" using radio-compounds and sophisticated instrumentation. Nuclear technology is also employed to assay the extremely small concentration of certain substances in blood plasma and other body materials.

Nuclear medicine is responsible for a host of revolutionary, safe, non-invasive diagnostic procedures that are now available to physicians in all branches of medicine.

Job Opportunities

A nuclear medicine technologist performs the diagnostic procedures of nuclear medicine. Certified graduates work primarily in the nuclear medicine departments of hospitals. In addition to performing a wide variety of tests on patients, the technologist may also perform lab tests on patients' samples; prepare radiopharmaceuticals for injection into patients; record test results; receive, handle, record, store and measure radioactive materials; and perform quality control procedures on a wide variety of instrumentation and imaging devices.

The Program

Designed to prepare graduates to function as technologists in nuclear medicine departments, the program is a combination of lecture and lab instruction at BCIT and clinical experience in the nuclear medicine departments of those clinical facilities presently affiliated with the program.

The student will spend terms 1 and 2 of first year at BCIT for lectures and labs in basic subjects applicable to nuclear medicine technology and patient care. The Institute is equipped with a lab containing facilities and equipment commonly used in nuclear medicine departments. The student spends the summer term of first year in the nuclear medicine department of a hospital.

In the second year at BCIT, the student spends alternate weeks at BCIT and the nuclear medicine department of one of the Lower Mainland hospitals. The summer term of second year is spent in a nuclear medicine department gaining further clinical experience.

On successful completion of the two year (six term) program, the student receives the BCIT Diploma of Nuclear Medicine Technology and is eligible to write national certification examinations.

Post-graduation

Graduates of the BCIT program are eligible to take the National Certification Examinations set by the Canadian Association of Medical Radiation Technologists. Successful candidates may use the designation **R.T. (N.M.)** after their names and work as registered nuclear medicine technologists anywhere in Canada or in many parts of the world. An **Advanced Certification** is now available for those technologists wishing to advance in the field.

Prerequisites

Graduation with a C+ standing from the Selected or Combined Studies Program with Math 12 (pre-June, 1978), Algebra 12, or Algebra 12 (Honors) (post June, 1978), Chemistry 11 and 12 and one other science 11, Physics 11 is an advantage. Since the work is highly technical and exacting, the student must feel comfortable with complex instruments, possess manual dexterity and meticulous work habits. Applicants must have a strong sense of responsibility and a desire to work with and for patients of all age groups. Applicants are expected to be competent in oral and written English. The Nuclear Medicine Technology is open to men and women.

A preadmission interview is conducted with members of the Nuclear Medicine Program staff to assess the applicant's suitability for the field. Students must undergo a medical examination by their own physician and a complete updating of immunizations. Students are required to complete the Safety-Oriented First Aid Course (St. John Ambulance) prior to admission, or during the first term of the program.

Course of Studies

Year 1	Term 1	Clrm hrs/wk
30.106	General Chemistry for Nuclear Medicine Technology	6
32.174	Basic Technical Mathematics	5
33.105	Basic Physics for Nuclear Medicine	6

Year 1	Term 1 cont.	Clrm hrs/wk
70.109	Clinical Laboratory Orientation	3
74.107	Radioassay Procedures	3
98.106	Basic Anatomy and Physiology	4
98.126	Basic Medical Microbiology and Immunology	2
		29

Year 1	Term 2	
30.206	General Chemistry for Nuclear Medicine Technology	6
32.274	Statistics and Calculus	5
33.205	Radioactivity and Instrumentation	7
74.204	Clinical Orientation	2
74.205	Radiobiology and Protection	2
74.207	Radiopharmaceuticals	4
76.202	Fundamentals of Patient Care	3
98.206	Physiology and Pathophysiology	4
		33

Year 1	Summer Term	
74.209	Clinical Experience in Diagnostic Procedures	35

Year 2	Term 3	
31.374	Communication for Health Technologists	2
33.305	Measurement of Radioactivity	6
74.304	Applied Physiology	17
74.308	Imaging	2
98.306	Physiology and Pathophysiology	4
		31*
74.305	Clinical Experience in Diagnostic Procedures	35*

Year 2	Term 4A	
14.412	Computer Applications	3
31.474	Communication for Health Technologists	4
33.405	Measurement of Radioactivity	2
74.404	Applied Physiology	17
98.439	Human Behavior	4
		30
74.405	Clinical Experience in Diagnostic Procedures	35*

Year 2	Term 4B	
14.412	Computer Applications	3
31.474	Communication for Health Technologists	4
74.404	Applied Physiology	17
98.439	Human Behavior	4
		28*
74.405	Clinical Experience in Diagnostic Procedures	35*

Year 2	Summer Term	Clrm hrs/wk
74.409	Clinical Experience in Diagnostic Procedures	35

alternate weeks

Subject Outlines

14.412 Computer Applications — Applications of the computer in engineering and medical technologies: how a computer works, recognizing problems suitable for computer solution, flowcharting and communicating with computer personnel. Emphasis is on the use of computers to solve problems related to the technology concerned. Where available, "package" programs will be demonstrated and used by students. FORTRAN or BASIC programming language is taught depending on the technology.

30.106, 30.206 General Chemistry for Nuclear Medicine Technology — This course covers basic general chemistry, including electrochemistry, an introduction to organic chemistry (including the naming, properties and reactions of the major classes of organic compounds) and an introduction to biochemistry (including the nature and metabolism of carbohydrates, fats and proteins). Lab work consists of quantitative analysis (both gravimetric and volumetric), techniques and syntheses in organic chemistry and some biochemical techniques frequently encountered in the clinical lab.

30.206 See 30.106

31.374, 31.474 Communication for Health Technologists — An introduction to the oral and written communications applicable to the health field. Students will be taught the basic skills of effective writing for reports, letters, job applications, resumés and memoranda. Students will also be instructed in the techniques and skills necessary to effectively present an oral report and to function effectively in meetings.

31.474 See 31.374

32.174 Basic Technical Mathematics — Topics in algebra, logarithms (common and natural), logarithmic and exponential equations, graphical analysis and statistics (organization and presentation of data, measures of central tendency and dispersion).

32.274 Statistics and Calculus — Frequency distributions; estimations; sampling; hypothesis testing; nuclear medicine counting statistics; linear and curvilinear regression. An introductory course in calculus with applications involving differentiation and integration of algebraic, logarithmic and exponential functions.

33.105 Basic Physics for Nuclear Medicine — A special introductory level course covering topics of forces and motion, energy, static electricity, D.C. electricity, magnetism, A.C. electricity, atomic structure, nuclear structure and nuclides.

33.205 Radioactivity and Instrumentation — The theory portion of this course includes topics on nature and production of x-rays, measures of radioactive decay, modes of decay, and interaction of radiation with matter and nuclear reactions. The measurement portion of the course concentrates on instrumentation. Topics include an in-depth study of scintillation-type detector systems and Anger-type gamma cameras.

33.305, 33.405 Measurement of Radioactivity — This course completes the instrumentation work begun in 33.205. Topics include sensitivity and resolution in scanning, collimators, liquid scintillation counting, G.M. detectors, proportional counters, ionization detectors, semiconductor detectors, TLD, positron scanning and the Pho-Con camera.

33.405 See 33.305

70.109 Clinical Laboratory Orientation — An introduction to the principles and use of precision instruments employed in the lab, along with an introduction to hematology pertinent to the nuclear medicine lab.

74.107 Radioassay Procedures — This course covers the basic principles of radioassay procedures. A study is made of the components of the test system, the practical aspects of performing the tests and data reduction techniques. The clinical significance of routinely performed assays is discussed.

74.204 Clinical Orientation — This course involves familiarization with the affiliated Nuclear Medicine departments of the lower mainland hospitals, and a series of lectures given by technologists on the clinical applications of nuclear medicine techniques.

74.205 Radiobiology and Protection — A detailed study is made 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.

74.207 Radiopharmaceuticals — A study is made of the preparation and quality control of radiopharmaceuticals in routine use. Emphasis is placed on the radionuclide generator. Dosage forms and calculation and dispensing of doses are covered, along with the clinical application of various pharmaceuticals.

74.209, 74.305, 74.405, 74.409 Clinical Experience in Diagnostic Procedures — These courses require full-time attendance in the nuclear medicine department of an affiliated hospital. The purpose is to further develop the skills necessary for students to function safely and adequately in a nuclear medicine lab. Hands-on experience will be gained in all aspects of "in vitro" and "in vivo" procedures.

74.304, 74.404 Applied Physiology — The student is instructed in all aspects of current applied physiology including criteria, methodology, instrumentation, patient problems and approach, data collections and manipulation.

74.305 See 74.209

74.308 Imaging — This course is designed to familiarize Nuclear Medicine Technology students with the many methods and materials used to visually display the spatial distribution of radioactivity in nuclear imaging procedures. The utilization of optical, photographic, video tape and computer visual displays will be covered in theory and practice.

74.404 See 74.304

74.405 See 74.209

74.409 See 74.209

76.202 Fundamentals of Patient Care — This course assists the student to understand the hospital environment and the health problems of the patient. Emphasis will be placed upon observation and communication appropriate for the nuclear medicine technologist. The nursing lab will be used to practice basic technical skills and procedures required in emergency situations.

98.106 Basic Anatomy and Physiology — An introduction to cellular structure and function, followed by a survey of the anatomy and physiology of the body systems.

98.126 Basic Medical Microbiology and Immunology — This course deals with basic properties of medically important micro-organisms, the communicability of infection, host-parasite relationships and methods of destruction and control of micro-organisms, 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.

98.206, 98.306 Physiology and Pathophysiology — A systematic examination of the normal physiology of the human body and its derangement in disease states. General concepts of the disease process are included, as well as disturbance in function of specific body systems. Pathological examples are chosen to complement those conditions commonly encountered by students of nuclear medicine.

98.306 See 98.206

98.439 Human Behavior — An introduction to the basics of the psychological and social environment of health care organization, with the aim of understanding how communication patterns affect task activities.

Faculty and Staff

D.W. Martin, B.Sc. (Hons.), M.S.R., *Acting Department Head*
Ms. B. Clark, R.T., (T.&N.M.), Program Head
Miss J. Miki, R.T. (N.M.), R.T.C.S.L.T.
R.A. Singer, R.T. (N.M.)
R.J. Smith, M.S.R., R.T.

General Nursing

Department of General Nursing

Today's nurse works with other members of the health care team—physicians, physiotherapists, orderlies and social workers—to assist people in meeting their health needs. Demands made upon nursing professionals range from providing information on health concerns to promoting proper health care and preventing disease, as well as providing restorative care and emotional support. Although it is a high-stress profession, both men and women find the challenges of general nursing a deeply satisfying career experience.

Job Opportunities

The graduate of this nursing program is eligible to apply for licensure as a Registered Nurse in the Province of British Columbia. Graduates who pass the R.N. licensure exams may seek employment in hospitals and community agencies. Positions for the new graduate are available in medicine, surgery, pediatrics, maternity, psychiatry and in long-term care units.

The Program

In accordance with the recommendations of the Registered Nurses' Association of British Columbia, the nursing program prepares graduates to seek employment in general hospitals or other health care agencies where a comparable level of patient care and nursing judgement are required. It provides 22 months of instruction during a 2⅓ year period. Enrolment in the program is in January or August of each year. The program has five general areas of instruction: medicine, surgery, maternity, pediatrics and psychiatric nursing. Lectures and tutorials are complemented by clinical experience in a variety of settings.

Students will complete a program consisting of five terms. Each term is approximately 17 weeks in length. The fall term extends from late August to mid-December and the winter term from January to mid-May. Students are free of studies from mid-May to mid-August.

Admission Requirements

For applicants under 23 years of age at the time of entry into the program:

1. Graduation from grade 12 (B.C. secondary school or equivalent), with Chemistry 11 and either Chemistry 12 or Biology 12.
2. A minimum of C+ or better in both of the above courses; a minimum of C in Algebra 11 and English 12.
3. A valid St. John Ambulance standard First Aid certificate is required by the end of term 1, and preferably prior to entry into term 1.
   CPR (Basic 1) prior to entry into Term IV.
4. Completion of the immunization program is required before complete acceptance into the program.
5. A physical examination by a physician of the applicant's choice, indicating satisfactory health.
6. An interview with a member of the General Nursing Department who will assess the applicant's:
   - knowledge of and motivation towards a nursing career
   - financial preparation
   - communication skills
   - experience in the health care field as a volunteer and/or employee.

The Student Selections Committee of the General Nursing Department is responsible for the selection of applicants who meet, to the greatest degree, the requirements outlined above.

For applicants over 23 years of age (mature) at the time of entry into the program:

1. Successful completion of grade 11 and grade 12 equivalency e.g. BTSD.
2. Chemistry 11 and either Chemistry 12 or preferably Biology 12, to be completed within two years prior to enrolment.
3. A C+ or better in both of the above courses.
4. Part-time or full-time employment in the health care field prior to entry into the program. (A reference will be requested from the agency in which the applicant's latest experience was obtained).
5. A valid St. John Ambulance standard First-Aid certificate by the end of term 1 and, preferably, prior to entrance into term 1.
   CPR (Basic 1) prior to entry into Term IV.
6. Completion of the immunization program.
7. A physical examination by a physician of the applicant's choice, indicating satisfactory health.
8. An interview with a member of the

General Nursing Department, who will assess the applicant's:
- — knowledge of and motivation towards a nursing career
- — financial preparation
- — communication skills

The Student Selections Committee of the General Nursing Department is responsible for selecting applicants who meet, to the greatest degree, the requirements outlined above.

Expenses
In addition to tuition fees, students will spend approximately $400 for textbooks over the 2⅓ year program. Uniforms and shoes are about $200. The registration examination fee is $118. Most students also purchase a graduation pin for $120. The student is also responsible for transportation to the community agencies and hospitals where he or she will have selected learning experiences.

Financial Assistance
BCIT has a comprehensive financial assistance program—scholarships, loans and bursaries. Details are available from Student Financial Services.

Special Note on Applications
Applications are accepted for review by the Student Selections Committee between January 2 and May 31 for the August class and June 1 and October 31 for the January class.

Post-graduation
Following completion of the nursing diploma program, students may write the Canadian licensure examinations in order to obtain the R.N. (Registered Nurse) designation. After gaining some experience, graduates may elect to undertake one of many post-basic programs available in Canada or the U.S. to further their knowledge and skills in specialty areas of nursing. Most universities in the major cities also offer Bachelor of Nursing programs for graduates from diploma programs.

Part-Time Program
BCIT also offers a part-time program in General Nursing at the Downtown Education Centre. Prerequisites are the same as for the full-time program and students have seven years to complete the entire program. For further information contact the General Nursing Department.

Course of Studies

		Clrm hrs/wk
Year 1	**Term 1**	
76.100	Nursing I: Theory	9
	Clinical	13
98.105	Anatomy and Physiology	3
98.118	Personal Fitness Management	2
	Library and Research	5
		35
Year 1	**Term 1 cont.**	
98.139	Sociology	1.5
98.140	Human Development I	1.5
	Library and Research	5
		35
Year 1	**Term 2**	
76.150	Nursing II: Theory	8
	Clinical	13
98.205	Physiology	3
98.225	Microbiology	1
98.226	Immunology	1
98.240	Human Development II	3
	Library and Research	6
		35
Year 2	**Term 3**	
31.376	Writing for Nurses	3
76.200	Nursing III: Theory	9
	Clinical	18
	Library and Research	5
		35
Year 2	**Term 4**	
31.476	Modern Literature	3
76.250	Nursing IV: Theory	8
	Clinical	18
	Library and Research	6
		35
Year 2	**Term 5**	
76.300	Nursing V: Theory (1 week)	28
	Clinical (for 16 weeks of term)	37.5

Subject Outlines

31.376 Writing for Nurses — This course teaches general writing skills and their specific application to professional writing tasks in the clinical area.

31.476 Modern Literature — This course is a general study of 20th Century literature with emphasis on social and psychological issues.

76.100 Nursing I — An overview of the nursing curriculum and the study of individuals who are able to satisfy their own needs or who require minimal assistance to satisfy needs. Emphasis is placed on the normal requirements for need satisfaction and the stressors associated with lifestyle patterns. The student is introduced to the nursing process, the basic concepts of communication and the nurse-patient relationship, organizational skills and the responsibilities of the professional nurse. Concurrent theory, lab and clinical practice will focus on assessment skills, basic communication skills and psychomotor skills related to comfort. Clinical experience is provided in community and hospital setttings.

76.150 Nursing II — The study of individuals of all ages whose responses to stressors may be appropriate and/or inappropriate and have no immediate potential to interfere with survival. Emphasis is placed on stressors associated with the stages and tasks of growth and development. Concurrent theory, lab and clinical practice will focus on the nursing skills required to assist individuals to satisfy needs. Clinical experience is provided in community agencies where normal growth and development can be emphasized, and in hospital, extended care units and general surgical units. Prerequisite: Nursing I (76.100)

76.200 Nursing III — The study of individuals of all ages whose responses to stressors may be appropriate and/or inappropriate but have the potential to interfere with survival. Emphasis is placed on the stressors associated with both the selected unanticipated events and the growth and development tasks related to birth. Concurrent theory, lab and clinical practice will focus on the nursing skills required to assist individuals to satisfy needs. Emphasis is placed on developing supportive relationships with individuals and their involved family members. Clinical experience is provided in hospital settings, on family-centered maternity units and on pediatric units. Community visits are integrated throughout the course. Prerequisite: Nursing II (76.150).

76.250 Nursing IV — The study of individuals of all ages whose inappropriate responses to stressors threaten survival. Emphasis is placed on the stressors associated with selected unanticipated events. Concurrent theory, lab and clinical practice will focus on the nursing skills required to assist individuals to satisfy needs. Emphasis is placed on developing therapeutic relationships with individuals and their involved family members. Clinical experience is provided in hospital settings on psychiatric and general medical-surgical units. Community visits are integrated throughout the course. Prerequisite: Nursing III (76..200).

76.300 Nursing V — Nursing emphasizes the integration of previously presented knowledge and skills. Theory focuses on leadership skills and the responsibilities of the graduate nurse. Clinical experience is provided on general medical-surgical units, where students are assigned to registered nurses, who assume the role of preceptor. Prerequisite: Nursing IV (76.250).

98.105 Anatomy and Physiology — A survey of the basic structure and function of human body systems. An introduction to the basic principles of genetics is also included.

98.118 Personal Fitness Management — A combined theory and practice course designed to emphasize the relationship of physical fitness to lifestyle patterns. The focus is placed on the student's own activity pattern.

98.139 Sociology — This course provides an introduction to the study of human behavior. Basic terminology & concepts of sociology are presented. Emphasis is placed on the study of the family as a social institution, as well as on other forms of group processes & collective behavior.

The relationship between behavioral sciences and problems of health care is examined.

98.140 Human Development I — This course focuses on the processes of growth and development from conception through early childhood. Physical, cognitive, affective and social development are surveyed with emphasis on relating developmental concepts to health care.

98.205 Physiology — A study of physiological regulation and control based on the fundamentals established in 98.105.

98.225 Microbiology — This course provides an introduction to basic microbiological concepts, including the distinguishing characteristics of micro-organisms, methods of controlling infectious disease and host-parasite relationships.

98.226 Immunology — This course provides an understanding of the immune response as is applied to immunity, surveillance, homeostasis, hypersensitivity, autoimmunity and immunohematology. The course progresses from discussions on the components and biological activities of the immune response to the immune response role in protective as well as disease conditions. Prerequisites: Anatomy and Physiology (98.105).

98.240 Human Development II — This course focuses on the growth and development from middle childhood to death. Physical, cognitive, affective and social development are surveyed. Emphasis is placed on relating developmental concepts to health care. Prerequisites: Human Development I, 98.140.

Faculty and Staff

Mrs. M. Neylan, M.A., B.S.N., R.N., *Acting Department Head*
Mrs. L. Barratt, R.N., Diploma Psychiatric Nursing.
Ms. M.J. Belfry, B.N., R.N., Chief Instructor Term V
Mrs. D.M. Belyk; B.S.N., R.N.,
Mrs. E. Carr, B.S.N., R.N.
Ms. V. Cartmel, B.S.N., R.N., Chief Instructor Year 1
Ms. K. Doyle, B.N., R.N.
Mrs. K. Edwards, B.S.N. (Honors), R.N.
Ms. E.M. Fraser, B.S.N., R.N.
Mrs. S. Gallo, B.Sc., Ph.N., R.N.
Mrs. N. Goad, B.S.N., R.N.
Ms. B.A. Greenlaw, B.N., R.N., Chief Instructor Year 2
Mrs. H.D. Hintz, B.S.N., R.N.
Mrs. A. Kenney-Lee, B.N., R.N., M.Ed.
Mrs. M. LaBelle, B.N., Diploma P.H., R.N.
Ms. B.A. Lawes, B.Sc.N., R.N.
Mrs. M.E. Martin, B.S.N., R.N.
Ms. A.J. Mazzocato, M.S.N., B.N., R.N.
Ms. L.P. Meredith, M. Adult Ed., B.S.N., R.N., LTD.
Mrs. L. Milligan, R.N., B.S.N.
Mrs. K. Negoro, Diploma Nrsg.Ed., R.N.
Mrs. A.L. Novada, B.S.N., Diploma T.S.
Mrs. M. Olson, B.S.N., R.N.
Mrs. K. Quee, B.Sc.N., R.N.
Ms. M.N. Renwick, B.S.N., Diploma T.S., R.N.
Ms. A. Rose, B.Sc., R.N.
Mrs. A. Taylor, B.Sc.N., R.N.
Mrs. J. Verner, B.S.N., R.N.
Mrs. M. Walmsley, M.Ed., B.S.N., R.N.
Ms. M.W. Whitehead, M.A. (Educ), B.S.N., R.N. Diploma Obs., R.N.
Ms. P.V. Zabawski, B.Sc.N., R.N., Chief Instructor Curriculum.
Mrs. D. Zimka, B.Sc.N., R.N.

Support Staff

Mrs. A. Derosier, Clerk Typist.
Mrs. F. Nordstrand, R.N.
Mrs. B.V. Tearse, Clerk Typist.

Psychiatric Nursing

Department of Psychiatric Nursing
The psychiatric nurse works with people of all ages who have mental health problems or who are mentally retarded. These patients may also have common medical conditions such as diabetes. As a member of a health care team, the psychiatric nurse is able to assist individuals to solve mental health problems more effectively.

The Program
The Psychiatric Nursing Program is designed to provide basic preparation for practice in psychiatric nursing. Over a 2⅓ year period, it provides 85 weeks of instruction in classroom, laboratory and clinical settings. Throughout the first four terms, theoretical and laboratory courses are given concurrently with clinical practicums, as well as support courses in the biological/behavioral sciences and English. In the fifth term, students are assigned on an individual basis to preceptors who are practising nurses.

Clinical experience is provided in a variety of hospitals, health centres and community agencies. Psychiatric nursing students are assigned to selected agencies for clinical experience. In general hospitals, students are placed in medical-surgical, extended care and pediatric units. In psychiatric and mental retardation services, students receive experience in acute, long-term and community agencies. During the first four terms, clinical assignments are in the Greater Vancouver area. In the fifth term, placements will be in agencies throughout British Columbia.

Students will complete a program consisting of five terms. Each term is 17 weeks in length. The fall term extends from late August to Christmas and the winter term from January to early May. From early May to late August students are not enrolled in studies. Depending upon the individual student's needs, this interval may be used for remedial study or program related employment. However, it is strongly recommended that students plan a month's vacation to assure physical and mental readiness for the next term of studies.

New students are expected to attend a "Head Start" program prior to registration. This program provides instruction in study skills as well as pre-tests in English and arithmetic. Remedial instruction will be recommended for individuals with unsatisfactory scores.

Prerequisites
Graduation from the Selected or Combined Studies Program with Chemistry 11, and either Chemistry 12 or Biology 12 is required. Mature applicants must have English 12 or its equivalent, as well as the science prerequisites. A C+ standing or better in these subjects is preferred for all applicants.

Students are expected to be competent in written and oral English communication. Those whose English language performance in course work is unsatisfactory, may be required to undertake remedial instruction during the program.

All students are required to have a current St. John Ambulance Safety-Oriented First Aid certificate or equivalent. Students who are unable to complete a satisfactory first aid course before admission are expected to do so before the second term in their own time and at their own expense. Students are required to complete a Cardio Pulmonary Resuscitation course prior to Term 3. Typing and life-saving skills are desirable.

Students electing the psychiatric nursing program should have a strong desire to work with people, especially those who are mentally retarded or who have mental health problems. It is important that the student's physical and mental health is compatible with the requirements of the educational program and practice in psychiatric nursing.

A health examination and an interview are required as part of the selection procedure. Applicants are required to complete a specified immunization program as a condition of acceptance into the program. The immunization program includes: diphtheria and tetanus toxoid, Sabin oral poliomyelitis vaccine, rubella H.1. test and tuberculin tests. The immunization program for tuberculosis is strongly recommended but not required. The immunization program is one component of a health program to protect faculty, students and patients.

Educational Expenses
In addition to regular tuition fees, students should be prepared for further educational expenses. In Term 1 about $500 will be needed for expenditures such as textbooks, school supplies, uniforms and first aid course fees. In terms 2, 3 and 4 additional expenses are estimated to be $125 per term.

In the final term of the program students will require approximately $100 for the registration examination fee and $25 for school supplies. Many graduates also purchase a ring, which costs approximately $150. Students are responsible for transportation to community agencies and hospitals making the use of a motor vehicle two days per week in terms 1, 2, 3 and 4 and five days per week for term 5 highly desirable. The monthly cost of operating a motor vehicle is estimated to be $100. Additional costs for accommodation and travel may be incurred during the fifth term preceptorship.

Note: Figures given are estimates only. Expenses may vary considerably depending on individual preference and need.

Financial Assistance
Assistance for students in financial need is available through programs such as the **B.C. Student Assistance Program** (consisting of a loan/grant, plus an additional health bursary for qualifying health students) and the **BCIT Bursary Program**.

For more details please refer to the Student Financial Services section of this calendar. All applicants requiring financial support are urged to consult Student Financial Services early in the application process to discuss their individual situations with a counsellor.

Registration of Graduates
The Registered Psychiatric Nurses' Association of B.C. serves as a registering body and a professional association. Requirements for registration of BCIT graduates are:

1. Successful completion of the Psychiatric Nursing Program.
2. Recommendation by the Psychiatric Nursing Department to write the registration examinations.
3. Proof of age and legal name.
4. Writing and passing the registration examinations within two years of graduation from BCIT (fees currently $100).
5. Payment of an initial registration fee within one year of passing the examinations.
6. Fluency in writing and understanding English.
7. Good moral and ethical standing in the practice of psychiatric nursing.

Applicants who have had a criminal conviction for any charge other than a minor vehicle infraction, should confer with the Association prior to admission to the program.

Students are advised to apply for registration prior to completion of the program in order to ensure that documentation is complete, so that they are eligible to write the registration examinations following graduation from BCIT.

Employment Opportunities for Graduates
Following graduation and registration (RPN), employment opportunities in B.C. are excellent, with competitive salaries and benefits.

Effective December 1982 starting salary for a Nurse I is $1,945. per month.

Registered psychiatric nurses are employed by: psychiatric hospitals, psychogeriatric hospitals, schools for mentally retarded, general hospitals, forensic facilities, rehabilitation agencies, extended and intermediate care services and other specialized agencies.

The Registered Psychiatric Nurses' Association of B.C. provides labor relations services for its members. The Health Sciences Association provides this service for registered psychiatric nurses employed in general hospitals.

Educational Opportunities for Graduates
Graduates are eligible to enter the General Nursing diploma programs at BCIT, Douglas and Okanagan Colleges with one year's advance credit. Graduates interested in administration are eligible to enter the One Year Management Program in Health Services available in the evenings through Continuing Education and Industry Services.

How to Apply
The Psychiatric Nursing Department welcomes applications from men and women and mature students, as well as recent high school graduates. Most students enrol in full-time study. There is also some opportunity for part-time study.

Registered nurses (R.N.'s) who wish to increase their skills in psychiatric nursing will be considered for admission into second year of the program, where they are required to complete one year of study before becoming eligible for a Diploma in Psychiatric Nursing.

Licensed practical nurses (LPN's) will be considered for direct entry into Term 2 of the program.

Applicants are advised to apply as early as possible to ensure adequate time for assessment and academic and financial counselling. For more information on the program, contact the Department of Psychiatric Nursing for an interview.

Dates of application:
January 2 for August classes
June 1 for January classes

Dates of Terms - 1984/85
August 20 - December 14 (inclusive)
January 2 - May 3 (inclusive)

Course of Studies

		Clrm hrs/wk
Year 1	**Term 1**	
77.100	Psychiatric Nursing 1	6
77.105	Psychiatric Nursing Practicum I	9
77.110	Interpersonal Relationship Laboratory I	2
77.120	Psychomotor Laboratory I	3
98.105	Anatomy and Physiology	3
98.118	Personal Fitness Management	2
98.142	Sociology	2
98.143	Human Development I	2
		29
Year 1	**Term 2**	
77.150	Psychiatric Nursing 2	6
77.155	Psychiatric Nursing Practicum 2	10
77.160	Interpersonal Relationship Laboratory 2	2
77.170	Psychomotor Laboratory 2	3
98.208	Physiology	3
98.225	Microbiology	1
98.226	Immunology	1
98.243	Human Development II	4
		30
Year 2	**Term 3**	
31.377	Writing for Nurses	3
77.200	Psychiatric Nursing 3	6
77.205	Psychiatric Nursing Practicum 3	15
77.210	Interpersonal Relationship Laboratory 3	2
77.220	Psychomotor Laboratory 3	2
98.308	Pathophysiology	2
		30
Year 2	**Term 4**	
31.477	Modern Literature	3
77.250	Psychiatric Nursing 4	6
77.255	Psychiatric Nursing Practicum 4	15
77.260	Interpersonal Relationship Laboratory 4	2
77.270	Issues in Psychiatric Nursing	2
		28
Year 2	**Term 5**	
77.300	Psychiatric Nursing 5	27 (3 wks)
77.305	Psychiatric Nursing Preceptorship	30 (14 wks)

Subject Outlines

Year 1 Term 1

77.100 Psychiatric Nursing 1 — An overview of psychiatric nursing and the health care system as it relates to mental health. Emphasis is placed on human functional behavior in response to stressors in the environment. Students are introduced to the nursing process, a conceptual model for psychiatric nursing practice and the professional responsibilities of a psychiatric nurse.

77.105 Psychiatric Nursing Practicum 1 — A clinical practice course offered concurrently with Psychiatric Nursing 1. Experience is provided in general hospitals, mental health, mental retardation and community settings with clients of all ages. Emphasis is placed on the development of skills related to assessment and activities of daily living, and the development of interpersonal relationships.

77.110 Interpersonal Relationship Laboratory 1 — A lab practice course offered concurrently with Psychiatric Nursing 1. Emphasis is placed on development of self-awareness and basic communication skills.

77.120 Psychomotor Laboratory I — A lab practice course offered concurrently with Psychiatric Nursing 1. Emphasis is placed on those nursing skills related to basic assessment and activities of daily living.

98.105 Anatomy and Physiology — A survey of the basic structure and function of human body systems. An introduction to the basic principles of genetics is also included.

98.118 Personal Fitness Management — A combined theory and practice course

designed to emphasize the relationship of physical fitness to lifestyle. The focus is placed on the student's own activity.

98.142 Sociology — This course presents those concepts and methods of sociology which are most pertinent to the psychiatric nurse's understanding of human behavior in a social context. The internal and external components of man's environment are investigated. Social and epidemiological factors related to health and illness are reviewed. Evaluation of health research and programs is reviewed.

98.143 Human Development I — This course provides students with an introduction to concepts basic to understanding normal human development from conception through early childhood. Particular attention is given to relating the development of the individual to that of the family.

Year 1 Term 2

77.150 Psychiatric Nursing 2 — The study of people in relation to their growth and development and family environment. Emphasis is placed on the care of children who have physical and emotional problems. Professional responsibilities are continued from 77.100 and organizational skills are introduced. Prerequisites: all first term courses.

77.155 Psychiatric Nursing Practicum 2 — A clinical practice course offered concurrently with Psychiatric Nursing 2. Experience is provided in the pediatric areas of general hospitals and mental retardation services. Emphasis is placed on developing therapeutic relationships and selected nursing skills. Prerequisites: all first term courses.

77.160 Interpersonal Relationship Laboratory 2 — A lab practice course offered concurrently with Psychiatric Nursing 2. Emphasis is placed on the development of therapeutic relationships. Prerequisites: all first term courses.

77.170 Psychomotor Laboratory 2 — A lab practice course offered concurrently with Psychiatric Nursing 2. Emphasis is placed on the development of selected nursing skills. Prerequisites: all first term courses.

98.208 Physiology — An approach to physiology based on control and coordinated regulation. The prerequisite survey of anatomy and physiology (98.105) establishes that certain physiological responses occur. This course concentrates on the factors which determine the timing and degree of these responses, with emphasis on the cardiovascular, respiratory, digestive, urinary, reproductive, nervous and endocrine systems.

98.225 Microbiology — This course provides an introduction to basic microbiological concepts. These concepts include the distinguishing characteristics of micro-organisms, methods of controlling infectious disease, and host-parasite relationships.

98.226 Immunology — This course provides an understanding of the immune response as it applies to immunity, surveillance, homeostasis, hypersensitivity, autoimmunity and immunohematology. The course progresses from discussions on the components and biological activities of the immune response to the immune response role in protective as well as disease conditions. Prerequisites: Anatomy and Physiology (98.105).

98.243 Human Development II — This course provides students with an introduction to concepts basic to understanding normal human development from middle childhood to death. Particular attention is given to relating the development of the individual to that of the family. Prerequisite: Human Development I, 98.143.

Year 2 Term 3

31.377 Writing for Nurses — This course teaches general writing skills and their specific application to professional writing tasks in the clinical area.

77.200 Psychiatric Nursing 3 — The study of adults with specified maturational and/or situational stressors. Emphasis is placed on the care of adults with acute physical and emotional problems. Professional responsibilities and organizational skills are continued from 77.150. Prerequisites: all second term courses.

77.205 Psychiatric Nursing Practicum 3 — A clinical practice course offered concurrently with Psychiatric Nursing 3. Experience is provided in general surgical units of general hospitals and acute psychiatric in-patient units. Emphasis is placed on maintaining and terminating therapeutic relationships and developing nursing and organizational skills. Prerequisites: all second term courses.

77.210 Interpersonal Relationship Laboratory 3 — A lab practice course offered concurrently with Psychiatric Nursing 3. Emphasis is placed on the maintenance and termination of therapeutic relationships with adults. Prerequisites: all second term courses.

77.220 Psychomotor Laboratory 3 — A lab practice course offered concurrently with Psychiatric Nursing 3. Emphasis is placed on the development of selected nursing skills related to specified body systems and the care of the surgical patient. Prerequisites: all second term courses.

98.308 Pathophysiology — This course looks at pathology from a disease process approach, with emphasis on underlying principles. Common disorders encountered in the clinical area are used as examples. Complex patterns of disease, such as those encountered in the hepatic, renal, cardiac and respiratory systems, will be discussed. Prerequisites: Physiology (98.208)

Year 2 Term 4

31.477 Modern Literature — This course is a general study of 20th Century literature with emphasis on social and psychological issues.

77.250 Psychiatric Nursing 4 — The study of adults with multiple stressors. Emphasis is placed on nursing interventions for long-term multiple problems. Self-concept (identity and body image), loss, and support systems will be discussed. Professional responsibilities and organizational skills are continued from 77.200. Prerequisites: all third term courses.

77.255 Psychiatric Nursing Practicum 4 — A clinical practice course offered concurrently with Psychiatric Nursing 4. Experience is provided in long-term psychiatric and psychogeriatric settings. Emphasis is placed on initiating, maintaining and terminating therapeutic relationships with groups of clients and developing selected nursing and organizational skills. Prerequisites: all third term courses.

77.260 Interpersonal Relationship Laboratory 4 — A lab practice course offered concurrently with Psychiatric Nursing 4. Emphasis is placed on maintenance and termination of therapeutic relationships with groups of clients. Prerequisites: all third term courses.

77.270 Issues in Psychiatric Nursing — Selected sociological issues are discussed. Emphasis is placed on their influence and relevance to the practice of psychiatric nursing.

Year 2 Term 5

77.300 Psychiatric Nursing 5 — A review of psychiatric nursing practices, with emphasis on assisting students to develop the abilities of a psychiatric nurse, to assume responsibility, and to work with health team members. Also included is an introduction to the theory of organizational structures and management functions. Psychiatric Nursing Preceptorship (77.305) follows this course.

77.305 Psychiatric Nursing Preceptorship — This clinical practice course follows Psychiatric Nursing 5 (77.300). Experience is provided in various mental health facilities in B.C. Emphasis is placed on the integration of knowledge and skills learned in terms 1 to 4; on working effectively with team members; on assuming responsibility; and on the workload of a graduated psychiatric nurse. Prerequisites: satisfactory completion of all courses in terms 1 to 4 and of 77.300 in term 5.

Faculty and Staff

Margaret S. Neylan, R.N., B.S.N., M.A., *Department Head*
Joan Anderson, R.N., B.Sc.N., M.A. (Education)
Linda Brazier, R.N., B.S.N.
John Crawford, R.P.N., Cert. in Adv. Nsg., B.A.

Kathi Duncan, R.N., B.S.N., Chief Instructor
Shiron Erickson, R.N., Dipl.Psych.Nsg., B.N., M.A. (Ed.)
Mary Lou Evans, R.N., B.Sc.N.
Lynn Field, R.N., B.Sc.N.
Ray Fournier, R.P.N.
Stephany Grasset, R.N., B.Sc., P.H.N.
Yvonne Greene, R.N., B.Sc.N., R.M.N.
Jean Gunderson, R.N., R.P.N., Chief Instructor
Wilda Haydamack, R.N., Dipl.P.H.Nsg., Dipl.Psych.Nsg., B.Ed., M.Ed.
Joyce Heaton, R.N., B.Sc.N.
Anne Houseman, R.N., B.Sc.N., Chief Instructor
Elaine Jackson, R.N., B.S.N.
Beverley Miller, R.N., B.Sc.N.
Louise Moreau, R.N., B.Sc.N.
Jeanette Mossing, R.N., B.N.
Carol Niven, R.N., B.Sc.N.Ed., Chief Instructor
Marie Riediger, R.N., B.N.
Ross Stewart, R.N., R.P.N., R.M.N., M.H.Sc., Chief Instructor
Norma Vallentgoed, R.P.N., B.A.

Support Staff
Doreen Olson
Pat Ord

Acknowledgements
The Department acknowledges, with appreciation, the contribution of nursing service personnel to educational programs. In particular we wish to recognize the contribution of head nurses for the practicums in terms 1, 2, 3 and 4 and the preceptors in term 5.

Term 1 — Head Nurses
M. Bigg, Royal Columbian Hospital
L. Dunwell, Burnaby General Hospital
G. Hufnagel, West Lawn, Riverview
L. Licorish, East Lawn, Riverview
S. Mackenzie, East Lawn, Riverview
L. Pastorek, East Lawn, Riverview
D. Scroggs, Burnaby General Hospital
S. Theisen, Brookside, Riverview
M. Beattie, St. Vincent's Hospital

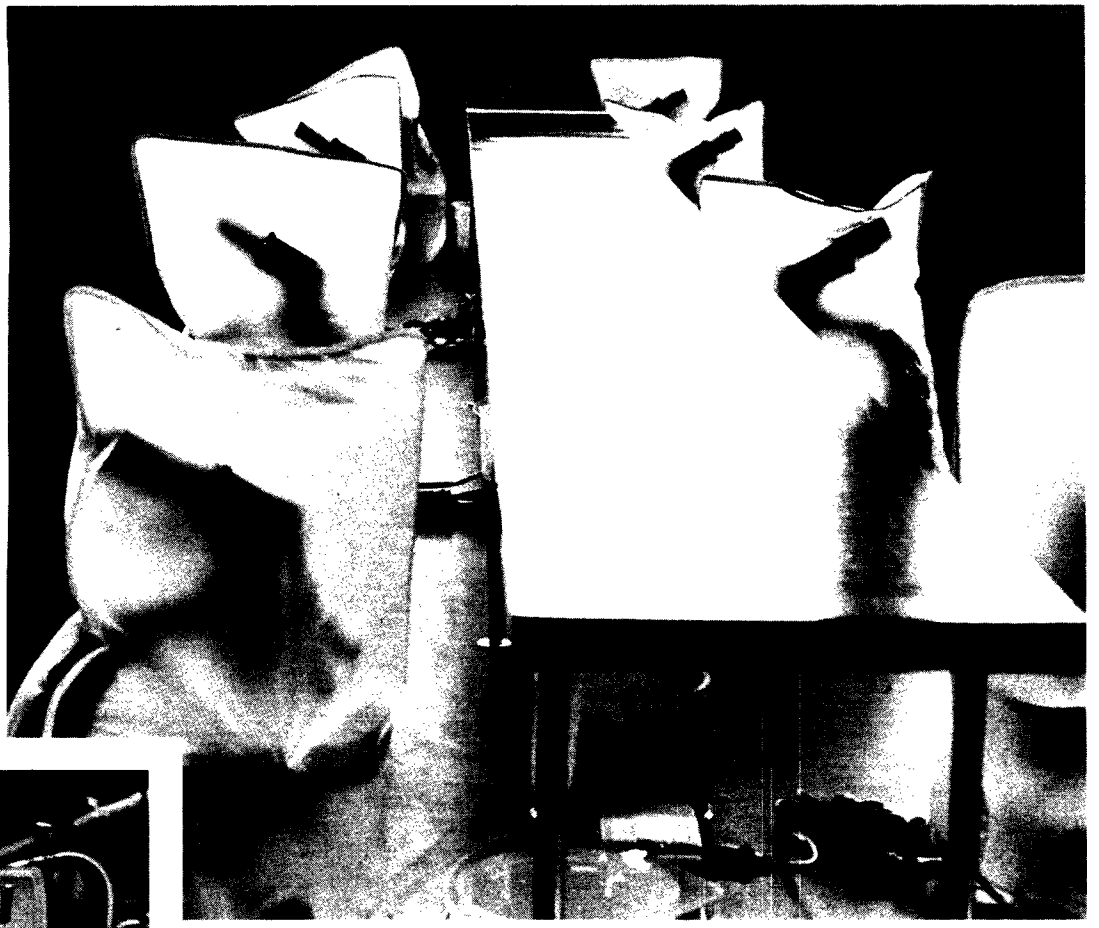
Term 2
B. Arnott, Medicine, Lion's Gate Hospital
V. Burch, Woodlands
G. Cameron, Crestwood School
K. Clark, Beacon Preschool
A. Hasle, Oakridge School
M. Johnson, Queen Elizabeth Annex
J. Kell, Pediatrics, Lion's Gate Hospital
A. Kohut, Woodlands
P. McPhee, Sunny Cedars
A. Pfeifer, Woodlands
J. Scalet, Woodlands
E. Snow, Woodlands
G. Stewart, Woodlands
J. Walker, Pediatrics, Burnaby General Hospital

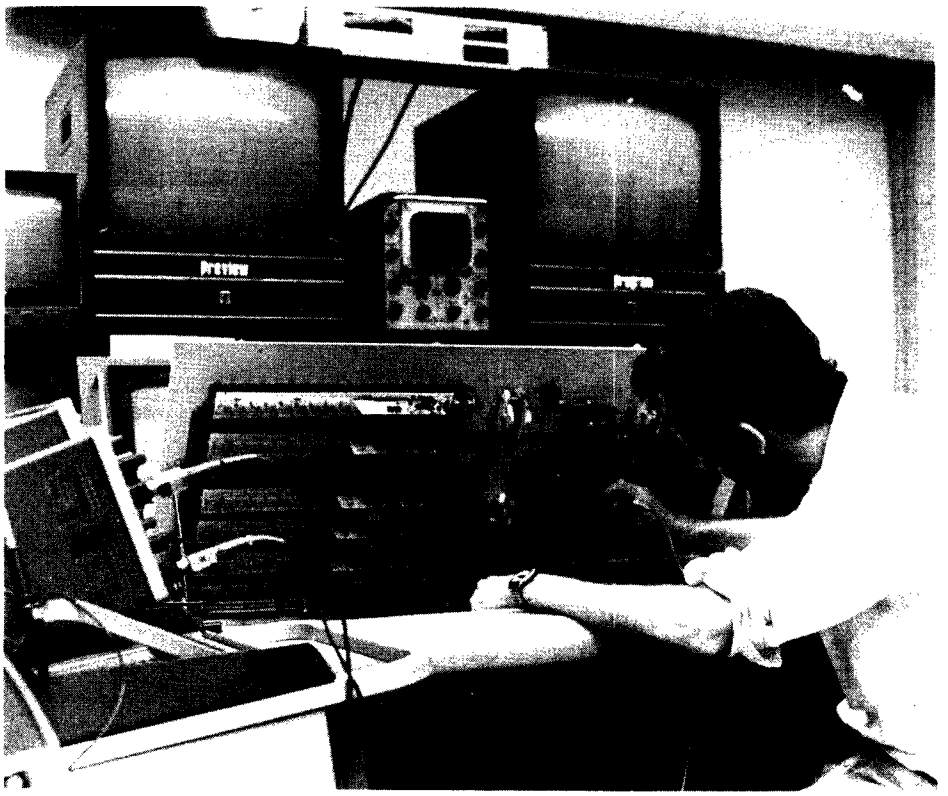
Term 3
Mrs. Allison, E2 Crease
Mrs. Heist, 1st Fl. Langley Memorial Hospital
Mrs. MacKenzie, Day Care
K. Medford, W2, Crease
T. Maximenko, A2, Lion's Gate Hospital
Mrs. Mooney, 3rd Fl. Langley Memorial Hospital
J. Pals, 2BD Burnaby General Hospital
S. Saunders, Burnaby Mental Health
C. Stockl, 2AC Burnaby General Hospital
V. Timmero, A4, Lion's Gate Hospital

Term 4
L. Batch, East Lawn, Riverview
M. Ibraheem, Fernwood Lodge, Riverview
J. Kallenberger, Valleyview
S. Kenyon, Riverview
D. Nagel, Valleyview
N. Runganaikaloo, Valleyview
E. Thiessen, Valleyview
M. Wagner, East Lawn, Riverview

Preceptors
C. Batch
J. Bond
J. Carten
D. Clements
P. Douglas
C. Hull
J. Jarvie
D. Josephs
B. Kelly
S. Lee
M. Makton
C. McDonald
D. Neicel
S. Petrie
L. Sinnen
D. Stone
S. Sinnen
T. Thornhill
J. Vance
T. Wick
K. Finch
P. Bernez

Third Year Programs





Broadcast Engineering

Broadcast Communications Technology

This post-diploma program is designed to meet the increasing need for highly skilled maintenance engineers in the broadcast and cable industries.

The Program

Three main course areas are supplemented with a co-operative education component.

Television studio systems and equipment provide the student with detailed experience in the maintenance of highly specialized equipment used in modern television and cable stations. Particular emphasis will be placed upon the servicing of video tape equipment, and will include studio, portable and remote equipment. Time will also be devoted to preventative maintenance schedules and systems design.

Radio studio systems and equipment will give students extensive practice in applying electronic skills to modern radio, monaural and stereo broadcast equipment. Special emphasis will be placed on new technology in radio broadcasting, keeping in mind the complexity of older equipment presently in use.

A.M. television and F.M. transmission systems and equipment maintenance will comprise the third course area.

Those from outside greater Vancouver will be given preference in their home locations with respect to co-op education assignments.

Prerequisites

Graduation with a National Diploma of Technology in Electronics, or equivalent experience in the work force.

Course of Studies

		Clrm hrs/annually
13.601	Basic Sound Production	38
13.602	Audio Technology	152
13.603	AM and FM Transmission Systems	76
13.604	Basic Television Production	76
13.605	Video Technology I	190
13.606	Video Technology II	190
13.607	TV Transmission Systems	38
13.608	Practicum	250

Subject Outlines

13.601 Basic Sound Production — Operation familiarization and production techniques for sound studies. Students are introduced to radio station organization, programming concepts, radio broadcast equipment and production techniques. The course is designed to give the student a basic appreciation and understanding of all aspects of radio broadcasting.

13.602 Audio Technology — The nature of sound-principles of hearing; definition and relationship of loudness and sound pressure levels; definitions and applications of white and pink noise; octave and third octave band filtering; noise criterion curves and applications; good design practice for noise control; sound level measurements; definition and significance of reverberation time; standing waves; absorption factors; measurement and control of reverberation time; good design practice for studio acoustics.

Audio signal sources; microphone types and characteristics; signal levels and impedances; typical control systems; amplifier performance criteria; input noise level and head-room; attennator networks; mixing and bridging networks; VU meter characteristics and calibration; program and graphic equalizers; artificial reverberation systems; signal distribution systems; audio monitoring systems; audio system test equipment and measurements.

Audio recording systems; reel/reel systems, principles and alignment techniques; NAB cartridge systems; principles and alignment techniques; disc recording principles and playback criteria; stereophonic signal control and processing; advanced audio signal processing techniques; peak limiters; volume compressors; selective processing; line transmission of audio signals; design criteria; advanced audio system test equipment and measurements.

13.603 A.M. and F.M. Transmission Systems — A.M. transmission standards and channel assignments; typical A.M. transmitting systems; A.M. modulation techniques, including high-level, dougherty and phase/amplitude; DOC monitoring requirements; transmitter test and alignment techniques; selection and use of R.F. transmission lines for A.M. systems; antenna array design criteria; DOC/FCC protection requirements; horizontal pattern determination; vertical pattern determination; array efficiency factors; tuning and phasing equipment design criteria; array alignment techniques; DOC proof of performance requirements; supplementary proof requirements; test equipment calibration.

F.M. transmission standards and channel assignments; typical F.M. transmitting systems; F.M. modulation techniques; stereo multiplexing principles and techniques; SCA multiplexing techniques; DOC monitoring requirements; transmitter test and alignment techniques; selection and use of R.F. transmission lines for F.M. systems; transmitting antenna selection criteria; antenna performance measuring techniques; DOC initial commissioning requirements.

13.604 Basic Television Production — Studio equipment operation and familiarization with production techniques.

13.605 Video Technology I — The television signal format; principles of interlaced scanning; review of imaging

devices, system limitations and critical parameters; typical monochrome camera system; typical monochrome control and distribution system; monochrome monitoring equipment; elementary video signal analysis.

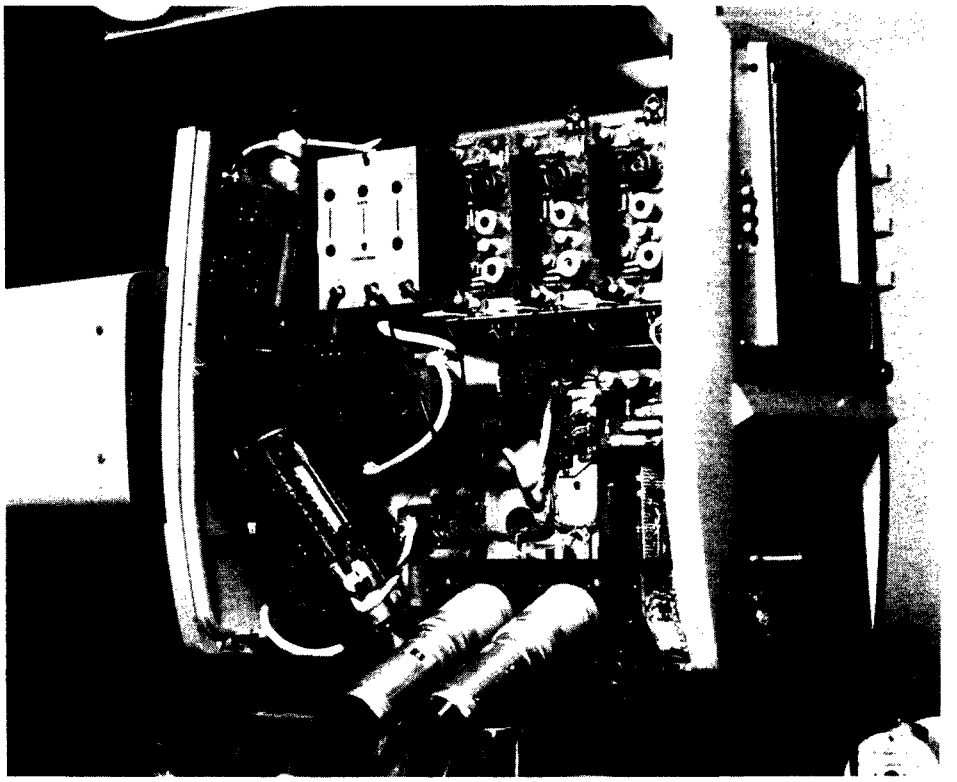
Principles of color signal encoding; color matrixing techniques; system limitations and critical parameters; typical 3 tube color camera system; camera fault analysis and alignment techniques; color signal control and processing; advanced color video signal analysis; vertical interval test signals.

13.606 Video Technology II — Principles of helical scan video recording; detailed analysis of typical recorders; equipment test and alignment techniques; equipment servicing exercises; principles of quadruplex video recording; detailed analysis of typical recorder; equipment test and alignment techniques; equipment servicing exercises; principles of electronic video editing; analysis of typical editing system.

Principles of digitizing video signals; advantages and limitations of digital signal processing; typical time-base correction system; typical digital frame store system; frame store applications, including standards conversion. Teletext and videotex data transmission systems; typical Telidon broadcast teletext transmission system; digital transmission performance analysis; typical Telidon decoding system.

13.607 T.V. Transmission Systems — Television transmission standards and channel assignments; principles of vestilial sideband transmission and signal recovery, principle of negative modulation; DOC transmission standards and monitoring requirements; principles and merits of various forms of visual transmitter modulation, e.g. low-level, high-level and I.F. modulation; detailed analysis of typical transmitter circuitry; transmitter test and alignment techniques; equipment servicing exercises; selection and use of R.F. transmission lines for television transmission; transmitting antenna selection criteria; antenna system performance measurements.

13.608 Practicum — Practical experience working in and with the broadcast industry.



Faculty and Staff

F.L. Sanderson, Dipl.Fd., B.Th.,
Department Head
S. Smolar, B.A.(Comms.), C.E.T.,
Program Head

Business Administration

Administrative Management Technology

Following some experience in the work force, engineering and health technologists may assume supervisory and managerial responsibilities. Although well-versed in the technical aspects of their field, they could, in most cases, benefit from further training in business management to be effective administrators. To fulfill this training need, BCIT has developed a full-time diploma program in business management for graduates in health and engineering technologies or equivalent.

The Program
The nine-month program includes such basic business subjects as accounting, economics, personnel administration, data processing and marketing to give students a thorough understanding of current business practices, which will enable them to apply a disciplined and professional approach to management. Lectures are supplemented by case studies and group discussions throughout the program. All students are required to carry eight courses each term.

Prerequisites
Graduation from a BCIT diploma program or a two-year college program in an engineering or health technology, or equivalent. Applicants should be interested in supervisory or managerial positions. Previous business experience is preferable, but not mandatory.

Post-graduation
Graduates of this diploma program may work towards accreditation as a Certified Administrative Manager through the Administrative Management Society.

Course of Studies

		Clrm
Year 1	**Term 1**	hrs/wk
10.002	Management III	3
10.010	Economics	3
10.045	Human Resource Management	3
10.080	Business Law	3
14.050	Introduction to Data Processing	4
16.140	Accounting	5
22.110	Business Mathematics	4
31.310	Advanced Business Communication	3
		28
Year 1	**Term 2**	
10.003	Management IV	3
10.011	Economics	3
10.020	Organizational Behaviour	3
10.081	Business Law	3
14.052	Computers in Business	4
16.240	Accounting	5
20.291	Marketing	4
22.408	Supervision	3
		28

Subject Outlines

10.002 Management III — This course emphasizes the use of decision-making models in business. It is designed to train students in the use of quantitative methods in the choice of alternatives in the decision-making process.

10.003 Management IV — An analysis of business policy formulation designed to give the student practice, experience and confidence in handling business situations, including those of a complex nature where basic policy decisions are necessary to assist in problem solving. Comprehensive business cases will be selected, covering such fields as finance, control, personnel, production, marketing and general management, for study and discussion. The course is designed to acquaint the student with the role of top management and the interrelationships between these fields. Determination of an acceptable course of action will be followed by the development of a proposed scheme of implementation.

10.010, 10.011 Economics — The aim of the course is to develop an understanding of the organization and operations of the Canadian economy. Students analyze demand and supply, how production costs vary and how prices are determined in different markets (micro-economics). The theoretical tools of the economist are used to explore the concepts of national income, employment, money and banking, inflation, international trade and growth (macro-economics). An appreciation of the relation between economic theory and economic policy is provided.

10.011 See 10.010

10.020 Organizational Behavior — The study of all factors that either influence or are influenced by people at work. The course will focus on macro factors such as organizational structure, technology and environment; group factors such as conflict and decision making; and micro or individual factors such as attitudes, perception and motivation.

10.045 Human Resource Management — An introduction to the major personnel and industrial relations programs applicable to the British Columbia workplace with emphasis on the value of the worker and the overall effectiveness of modern human resource management. It develops understanding of the skills required for selection interviews, performance appraisals, compensation reviews, labour contract negotiations, training and development programs, grievance and collective agreement administration and it reviews relevant employment law.

10.080, 10.081 Business Law — A study of legal rules and principles which guide decisions involving the law of contracts, including the sale of goods and negotia-

ble instruments, as well as the business associations of agency, partnership and the company.

10.081 See 10.080

14.050 Introduction to Data Processing — Training in basic data processing principles to develop recognition of the possible application of these principles in industry. The principal functions of data processing will be illustrated and practised with an H.P. minicomputer operating interactively. Elementary computer programs will be written and tested on the computer. Use of flowcharting and elementary data processing systems design will illustrate the achievement of data processing objectives.

14.052 Computers in Business — For those individuals not specializing in data processing, a look is given at the types of computer systems currently used in business. Topics include computer hardware and software development, program preparation (students will code and execute a COBOL program in this section), input-output media and devices, data centres, operating systems, controls in computer systems, installing a computer and current trends in the computer industry.

16.140, 16.240 Accounting — Basic accounting procedures; closing the books; adjustments; working papers; merchandise operations; statement and ledger organization; special journals; forms of business organization; accounting principles; introduction to cost accounting; analysis of financial data; working capital; departmental and branch operations; consolidations.

20.191, 20.291 Marketing — This course is designed to give students a good understanding of the role of marketing in a company. Marketing plays a critical role in any company dealing in a product or service, and the decisions made by the marketing manager are reflected in the company's administrative and financial functions. Lab sessions will deal with typical marketing problems and students are exposed to the decision-making process in marketing management.

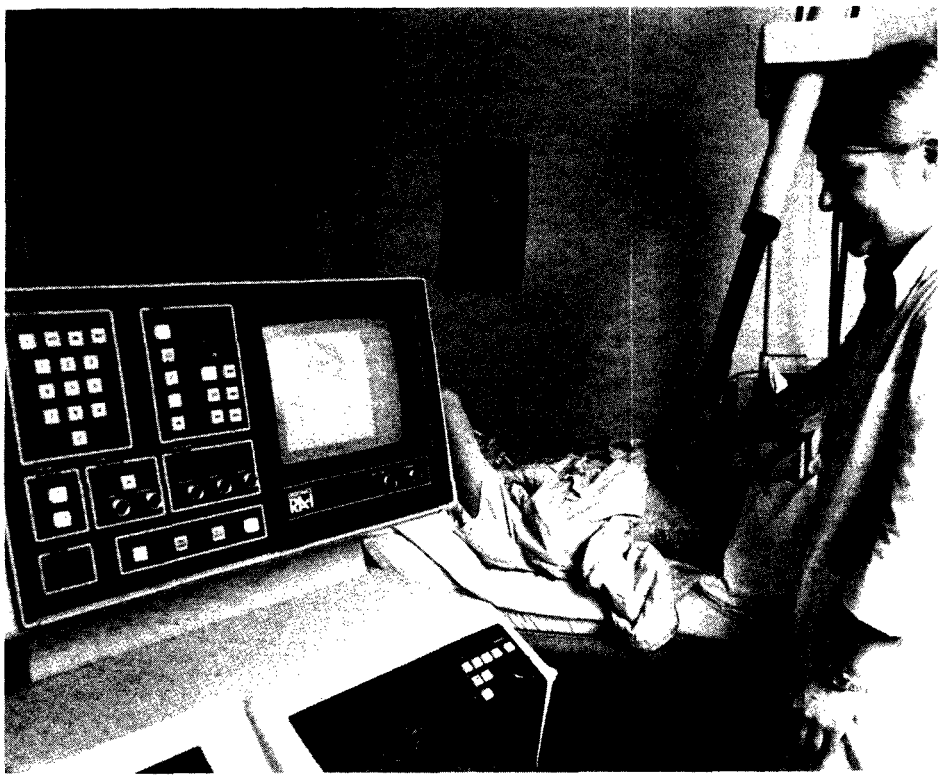
22.110 Business Mathematics — Review of basic mathematics applicable to business and industry; mathematics of finance, including retail operations, simple and compound interest, discounts, annuities, financial papers and depreciation methods. Emphasis is on practical applications as applied to business administration.

22.408 Supervision — This course deals with the application of management to organizational problems at the supervisory level. The course will develop students' skills in planning, decision-making, interpersonal and inter-group relations and communications.

31.310 Advanced Business Communication — As future managers, students learn to retrieve, extract and report information efficiently. Building on skills acquired in previous communication courses this course emphasizes improved reading, writing, and speaking skills. Course content includes speed reading, oral and written presentations, executive summaries and proposals. Students also use word processors.

Faculty and Staff

R.A. Cradock, B.Comm., M.B.A., R.I.A., F.S.M.A.C, *Department Head*
T.P. Juzkow, B.A.Sc., M.B.A., P.Eng., Program Head
D. Pepper, B.A., M.Sc., Ph.D.
G. Storey, B.A., M.Sc.
R.A. Yates, LLB., M.B.A.



Diagnostic Medical Sonography

Department of Radiological Technical Services

Diagnostic ultrasound is a rapidly emerging, relatively new medical diagnostic technique. Using high frequency sound waves transmitted and reflected through various body parts, it is possible to image organs, masses, and fluid collections within the body. The technique provides valuable diagnostic information. Unlike x-rays, ultrasound waves are non-ionizing. Diagnostic ultrasound energy is non-invasive and non-traumatic, and to date no significant biological effects have been demonstrated.

The field of Diagnostic Medical Sonography is dedicated to the preservation of life and health by diagnosis and prevention of disease. The diagnostic medical sonographer (ultrasound technologist) is a skilled person, qualified by academic and clinical training to provide patient services using diagnostic ultrasound. Sonographers work under the supervision of a doctor of medicine, qualified in the use and interpretation of ultrasound procedures.

Studies performed by the sonographer include: echocardiography, abdominal sonography, obstetrical/gynecological sonography, ophthalmic sonography, and neonatal brain sonography.

Job Opportunities

Graduates in this dynamic new allied health field will assume an important role in maintaining high quality patient care, provide leadership in the development of health programs, and participate in medical research.

Employment opportunities exist in a hospital ultrasound facility, or an integral section of another hospital department, such as radiology, cardiology, or obstetrics. A large percentage of the hospitals in B.C. have diagnostic ultrasound equipment and its use is expanding rapidly.

The Program

Due to the requirement of training and knowledge in an allied health field, the program is only one year in length. The first term is devoted to the theory of diagnostic ultrasound. The clinical aspects comprise the larger portion of the training. Clinical training is provided in selected hospitals in B.C.

The course of studies includes anatomy and physiology; pathophysiology; physics of ultrasound; instrumentation; and applied sonography.

Upon successful completion of the program, the graduate is eligible to write the American Registry of Diagnostic Medical Sonographers examinations.

Prerequisites

Successful completion of a two year allied health program such as radiography, nuclear medicine, or registered nursing, or a Bachelor of Science, or equivalent in an appropriate health related science.

Selection Criteria

Acceptance into the program will be based on:

- Post-secondary education transcripts.
- Previous educational & professional achievements.
- An autobiographical letter outlining the reasons for your interest in Diagnostic Ultrasound as a career.
- A personal interview.
- A letter of reference from a medical doctor with whom you have worked professionally.

Course of Studies

		Clrm hrs/wk
Year 1	**Term 1**	
33.523	Physics of Ultrasound	4.5
73.101	Applied Sonography	7.5
98.108	Anatomy and Physiology	3
98.109	Pathophysiology	3
	Clinical Experience	15
		36
Year 1	**Term 2**	
73.206	Clinical Experience in Echocardiography	12
73.306	Clinical Experience in Abdominal Sonography	12
73.307	Clinical Experience in Obstetrical and Gynecological Sonography	12
		36

Subject Outlines

33.523 Physics of Ultrasound — Topics include the physics of acoustic waves, transducers, ultrasonic field, ultrasonic imaging, basic pulse echo instrumentation, real time systems, cathode ray tubes, doppler effect, acoustic power, testing and calibration, and biological effects.

73.101 Applied Sonography — This course encompasses an in-depth study of echocardiography, abdominal sonography, and obstetrical and gynecological sonography. An introduction to opthalmic, neonatal head, and doppler ultrasound will be presented.

73.206 Clinical Experience in Echocardiography — The student will acquire the skills to carry out sonographic examinations and the ability to recognize normal and abnormal sonographic patterns in the heart.

73.306 Clinical Experience in Abdominal Sonography — The student will acquire the skills to carry out sonographic examinations and the ability to recognize normal and abnormal sonographic patterns in the abdomen.

73.307 Clinical Experience in Obstetrical and Gynecological Sonography — The student will acquire the skills to carry out sonographic examinations and the ability to recognize normal and abnormal sonographic patterns in the female pelvis.

98.108 Anatomy and Physiology — This course provides an overview of the organ systems of particular clinical interest to sonographers. Special emphasis is placed on the genitourinary, digestive (including liver, gall bladder, and pancreas) and cardiovascular systems. In addition, longitudinal foetal development is discussed and cross-sectional anatomy of the abdominopelvic cavity is examined.

98.109 Pathophysiology — An outline of the etiology and pathogenesis of those diseases commonly investigated by ultrasonography. The course is divided into three equal sections: obstetric and gynecologic pathology, abdominopelvic organ pathology and cardiography. General principles of the disease process and complex syndromes will also be discussed.

Clinical Experience

Time is spent in hospital Ultrasound Departments to obtain clinical and practical experience in support of classroom studies.

Faculty and Staff

D.W. Martin, B.Sc. (Hons.), M.S.R.,
Acting Department Head
Ms. K.A. McDiarmid, R.T., R.D.M.S.

Core Division

The Core Division consists of the departments of chemistry, English, mathematics and physics. It offers courses to students enrolled in all technology programs of the business management, engineering and health divisions. It also offers a program of non-credit pre-entry courses to students who may require upgrading for admission to BCIT through the Continuing Education Division.

Courses taught by the Core Division are extensions of material covered in the same subjects in secondary school. Specialization is relevant to the technology of the student's choice. Many of the courses are complemented by reading and writing labs in English and regular noon hour tutorials in physics and chemistry.

These courses include the "core" of knowledge, both theoretical and practical, which students need in order to understand and to make the best use of the specialized technological training. Good knowledge of the basic principles and some specialized knowledge of physics and chemistry are required of health and engineering technologists. All technologists require advanced skills in mathematics and English to communicate intelligently and clearly with others.

The core courses are developed, for the most part, in conjunction with technology departments and advisory committees in order to maintain a balance between the applied and the theoretical.

For further information concerning day school courses or their prerequisites, contact the appropriate department head or the Dean of the Core Division. For information on the BCIT preparatory program consult this calendar, the Continuing Education calendar, the appropriate department head or the Dean of the Core Division.

Faculty and Staff

R. Sterne, B.A.Sc., P.Eng., Dean

Department of Chemistry

C. Barnetson, B.Sc., *Department Head*
N. Abdurahman, B.Sc., M.Sc., Ph.D.
G.C. Anderson, M.I.S.T. (U.K.)
D.W. Conder, B.Sc., M.Sc.
C. Heady, Dipl. Tech.
T. Mepham, A.R.I.C., M.Sc.
C.J.C. Nichol, B.A., M.Sc., Ph.D.
M. Pickering
S.M. Reynolds, B.A., M.Sc.
J. Salvo, B.Sc., B.Ed.
R. Tam
E.E. Tang, B.Sc.
L.V. Tolani, B.Sc., M.Sc., D.I.C., C.Chem. M.R.I.C.
P.W. Van Ameyde, H.L.S. (Neth.), Ir.N.I.R.I.A.

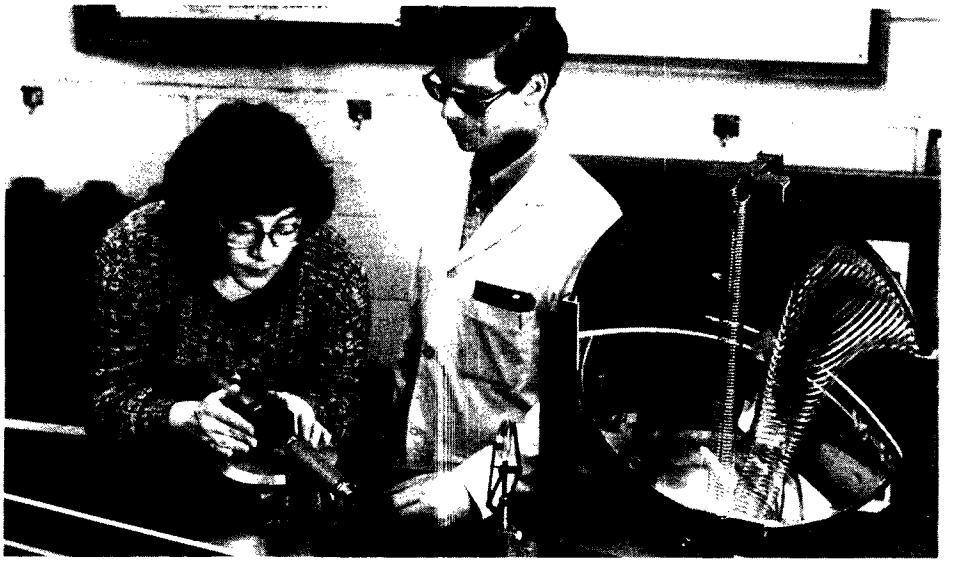
Department of English

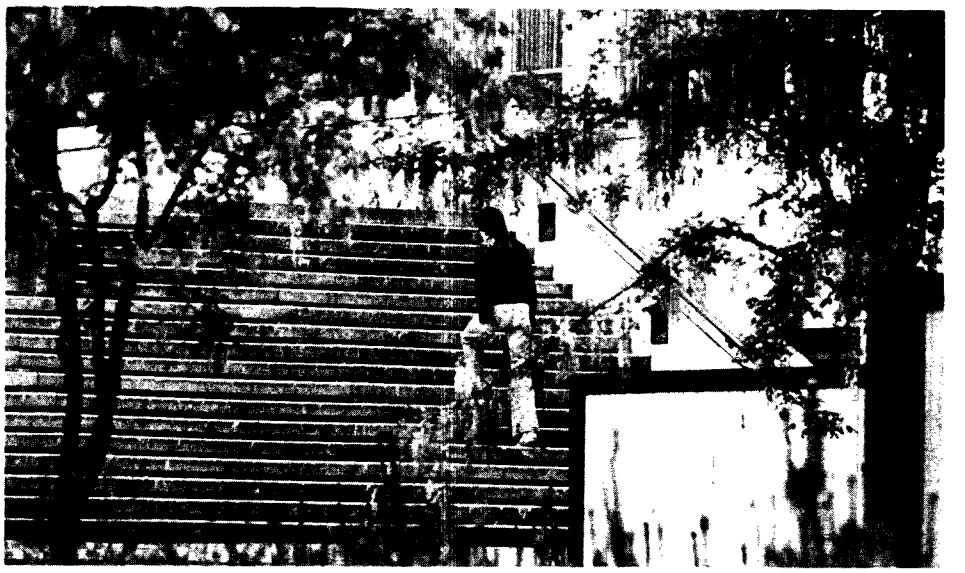
Richard Lund, *Department Head*
Robert Allin
May Archer, B.A. (Hons.), M.A.
Henry Arthur, B.A. (Hons.), M.A.
Ken Brambleby
Patrick Burns, B.A., M.A.
Jean Compton
Rider Cooey, B.A.(Hons.)
Grant Douglas
Tristan Easton, B.A., M.A.
Sue Fahey, B.A.
Brendan Frain
David Hamilton, B.Sc.
David Helgesen, B.A., M.B.A.
Douglas Horan, B.Journ., B.A.(Hons.)
Valda Johnston, B.A., B.Ed.
Glen Kask
Wayne Kean, B.A., M.A.
David Kipling
Ron Knott, B.A.(Hons.), M.Ed.
Greg Layton, B.A.
David McNeal, B.A., M.A., Ph.D.
Maureen Moore, B.A., M.A.
Bill Oaksford, B.A., M.A.
Michael Otte, B.A.(Hons.), M.A.
Trudy Ramsay, B.A.
Barbara Schillinger, B.A., M.A.
Jean Scribner, B.A., M.A.
Judy Segal, B.A.(Hons.), M.A.
Rudy Spence, B.Comm., B.A.
Don Steele
Eileen Stephens, B.A., M.A.
Dixie Stockmayer, B.A.

Patrick Thomas, B.A., B.Ed., M.A.
David Vale, B.A., B.Ed., M.Ed.
Anita Willson, B.A., M.A.

Department of Mathematics
J. Meisen, B.Sc., M.S., Ph.D.
Department Head
M.C. Bojadziev, Dip. Ing.
J.W. Brown, B.Sc.(Hons.), M.A.
A.K. Chu, B.A.Sc., P.Eng.
G. Cocksedge, B.Sc. For., M.Eng.
C.A. Copping, B.Sc.
A. Ellingsen, B.Sc.
P.M. Hobbins, B.Sc.
C.C. Lawrence, B.Sc.(Hons.)
R.D. Lynn, B.Sc.(Hons.), M.S.B.A.
A.F.I.M.A
E.R. Martin, B.Sc., M.Ed.
D. Sabo, B.Sc.(Hons.), Ph.D.
V. Sawadsky, B.A., B.Sc.(Hons.)
W.S. Sims, B.Sc.
E.L. Toth, B.Sc.
B.L. Turner, B.Sc.
H.E. Walker, B.A., D.L.S., M.R.I.N.
J.H. Wardroper, B.Sc. (Eng.), M.Sc., M.I.C.E., P. Eng.

Department of Physics
G. Bodnar
F. DiSpirito, B.A.Sc.
R. Englund, B.Sc.
L. Greenwood, B.Sc., B.A.
J. Griffiths, B.A.Sc., M.A.
H.D. Hecker
D.E.A. Kenyon, B.Sc.
A. Kshatriya, B.Sc., M.Sc.
D. MacDuff, B.Sc.,
R.C. MacDuff, B.Sc., M.Sc.
G. Olive, B.Sc.(Hons.), M.A.Sc., Ph.D.
W.V. Olson, B.Sc., M.Sc.
G.R. Paulson
J.R. Saunders, B.Sc., M.Sc.
G. Schellenberg, Dipl.Tech.
W. Swetlishoff, B.Ed.
D.E. Thom, B.Sc.
C. VanDeurzen, B.Sc., M.A., Ph.D.
L. Warren, B.A., M.A.
W.T. Withers
R.J. Woods, B.Sc., M.Sc., M.A.Sc.
K.A. Yakel, B.Sc.(Hons.), M.Sc.





Preparatory Courses and Technology Fundamentals Program

BCIT offers preparatory courses to individuals seeking entrance to full-time or part-time technology programs. This academic upgrading provides students with the opportunity to meet BCIT entrance requirements. By taking one or more preparatory courses students can become eligible to submit their admission application for consideration.

1. PREPARATORY COURSES

Preparatory courses in biology, business mathematics, chemistry, communications (English), physics and mathematics are offered regularly throughout the year. During the fall and winter most courses are in the evening while in the summer they are offered during the day and in the evening.

Courses may be taken individually or as a package. Since all courses may not be available in each time period, students should consult the Continuing Education course offerings for exact dates and times.

When applying for admission to day school programs students should indicate which preparatory courses they plan to complete.

Advice on course selection is available through Continuing Education.

The following courses are designed as prerequisites to BCIT level technological courses and satisfy specific course entrance requirements as outlined in this calendar.

COMBINED WRITING AND LEARNING SKILLS

31.996 Comprehensive Reading, Writing and Learning Skills — An integrated course which provides extensive coverage of all reading, writing and learning skills necessary for successful completion of technology and career programs. Covers all topics listed in 31.997 and 31.998, plus additional reading techniques for increased speed and comprehension.

WRITING

31.997 Effective Writing — This course develops the basic skills of effective writing with emphasis on business and technical applications, and is especially suitable for those who are uncertain of their skill in business and technical writing. Covers organization, paragraph development and effective sentences in letter and memo writing.

LEARNING SKILLS

31.998 Textbook Reading and Learning Skills — This course develops the skills necessary for success in learning, with particular emphasis on technology and career studies. Covers reading textbooks, taking notes, writing exams and managing time.

MATHEMATICS FOR ENGINEERING/ HEALTH

32.950 Pre-Entry Mathematics — An upgrading and/or refresher course for students who have not completed high school math or have completed it more than three years previously, or whose math background is otherwise weak. Satisfies Algebra 12 entrance requirements. Students intending to enter a technology which requires an Algebra 12 grade of C+ or better, must achieve a final mark of 65% or higher in 32.950. Prerequisite: C or better in Algebra 11 or approved equivalent math course.

32.X95 Pre-Entry Math-Distance Education — A self-study version of 32.950 for those unable to attend classes. Satisfies Algebra 12 entrance requirements. Students intending to enter a BCIT technology which requires an Algebra 12 grade of C+ or better, must achieve a final mark of 65% or higher in 32.X95. Students must have a C or better in Algebra 11 or an approved equivalent mathematics course to register.

Note: students who experience difficulty with math or who have been away from school for several years, are advised to take Mathematics 32.950.

MATHEMATICS FOR BUSINESS

22.900 Mathematics for Business — A course to upgrade and refresh the mathematical knowledge of students intending to enter the Business Management Division at BCIT. The course includes arithmetic, elementary algebra, graphical techniques and an introduction to business applications. It provides students with a suitable prerequisite for the mathematics programs in the Business Management Division, and meets the entrance requirement for BCIT.

CHEMISTRY

30.909 Chemistry — This course satisfies Chemistry 11 entrance requirements. An upgrading course for individuals whose background in chemistry is weak and a refresher course for those who have not studied chemistry for several years.

30.910 Chemistry — This course meets the Chemistry 12 entrance requirement for BCIT. It is an upgrading course for people with a weak background in chemistry or a refresher course for those who have not studied chemistry for several years. Applicants must have passed Chemistry 11 or approved equivalent chemistry course to register.

PHYSICS

33.909 Physics — This course satisfies Physics 11 entrance requirements. An upgrading course for individuals whose background in physics is weak and a refresher course for those who have not studied physics for several years.

BIOLOGY

98.909 Biology — This course meets the Biology 11 or equivalent program entrance requirement for BCIT.

98.910 Biology — This course meets the Biology 12 or equivalent entrance requirement for BCIT.

For additional information about courses and registration please write to BCIT Continuing Education or telephone (604) 434-5734 and ask for the locals listed below:

Continuing Education 204/205
Program Consultant 467
Program Assistant,
Engineering and Core,
Continuing Education 759
Core Division 816
Counselling Services 327

2. TECHNOLOGY FUNDAMENTALS PROGRAM

The Technology Fundamentals program is a non-credit upgrading program of at least three courses to assist the day school applicant who lacks some of the prerequisites for admission to a BCIT technology.

Technology Fundamentals is a day school program (Monday through Friday) that begins in early January and runs through to late May.

Courses available include: biology, business mathematics, chemistry, communications (English), physics and mathematics. These courses meet entrance requirements for BCIT day school technologies.

Technology Fundamentals students are, upon enrolment, guaranteed a seat for the next September in a participating technology subject to successful completion of the Technology Fundamentals Program. Space is limited. The participating Technologies include:

Engineering Division

Biological Sciences
Building
Electrical
Forestry
Mechanical
Process Group — Mining
— Natural Gas & Petroleum
— Chemical Sciences
— Lumber and Plywood
Recreation Facilities Management
Survey

Business Division

Operations Management

Health Division

Biomedical Electronics
Health Information
Environmental Health
Nuclear Medicine
Medical Radiography
Occupational Health & Safety

Depending on the courses required, the workload is 15 to 22 hours per week in day school classes plus an equal number of hours studying. For further information contact:

Core Division Office
BCIT
3700 Willingdon Avenue
Burnaby, B.C. V5G 3H2
Telephone: (604) 434-5734, local 816

Continuing Education and Industry Services

BCIT's Division of Continuing Education and Industry Services (CE&IS) offers a variety of credit and non-credit part-time courses, seminar workshops; and conferences both on and off-campus. CE&IS operates the Downtown Education Centre at 549 Howe Street in cooperation with Simon Fraser University. Nine floors of classrooms are used daily by educational institutions and organizations which rent space in this central downtown location. Recently, BCIT has established a Guided Learning Centre at the Downtown campus.

The Guided Learning Centre provides a testing service for adults. This testing is free of charge and gives each student an indication of their relative proficiency in English and/or mathematics. Following assessment, persons who wish may upgrade their skills by taking our upgrading modules which are available for independent study.

The Downtown Education Centre also houses the Educational Information Centre, a consortium of the Greater Vancouver School Districts; Vancouver Community College; Open Learning Institute; Pacific Vocational Institute; Simon Fraser University; University of British Columbia; Capilano, Douglas and Kwanlen Colleges; and BCIT offering information on post-secondary education in the lower mainland.

Business, Continuing Education offers credit courses in most BCIT day school technology programs in a variety of time frames at five locations in the lower mainland — BCIT Burnaby, Downtown Education Centre, Richmond, Surrey and Langley.

Students wishing either to upgrade their work related skills or to earn a certificate or diploma in a designated technology are provided with broad offerings across eight major business technologies.

Engineering and Core Continuing Education offers numerous credit and non-credit engineering-oriented courses. Programs of part-time study leading to Certificates and Diplomas are available in most of the BCIT day-school technologies.

Certificates are also awarded for some part-time studies not offered through the day-school, for example: Naval Architecture, Energy, Landscape, Drafting. Pre-entry and remedial courses in English, Mathematics, Physics and Chemistry are also offered, in addition to numerous non-credit engineering-oriented courses and seminars for those wishing to update their knowledge and skills.

Health Continuing Education offers courses and programs to those working in the health care delivery system and to those wishing to re-enter the health care field. These courses and programs enable health care workers to keep current with the latest developments in their fields and to prepare for career change.

The Certificate Program in Occupational Health & Safety is available through evening study. A new program, the Certificate of Credit in Nursing, enables students to begin courses leading to careers in nursing through independent study. Post diploma courses are also offered.

Both credit and non-credit courses are available in Nursing and Health Technology as well as Health Care Management programs at two levels, and full-time or part time refresher programs in Nursing.

Most courses are offered in the Lower Mainland and some are available throughout the province.

The Distance Education Department provides selected courses to adults who are unable to attend classes at the BCIT campus or who wish to study on an unscheduled basis. The courses provided through the department's Directed Study Centre are mainly career oriented and usually carry credit towards a BCIT or industry certificate. Students may register at any time of the year in most courses.

Telephone teleconferencing is used in many courses to reach homebound students in the lower mainland or correspondence students throughout the province.

The department provides educational consulting and design services to clients who need special courses or programs for their employees, members, or communities.

Business and Industry Services offers a unique, employee-training resource for industry — including government agencies, private and public operations, professional and volunteer organizations and individuals. It provides a variety of courses and programs throughout Canada in flexible formats, with emphasis on joint participation between industry and BCIT to determine training needs and establish curricula to meet those needs. Business and Industry Services are provided on the BCIT campus, on business or industry premises, or wherever convenient.

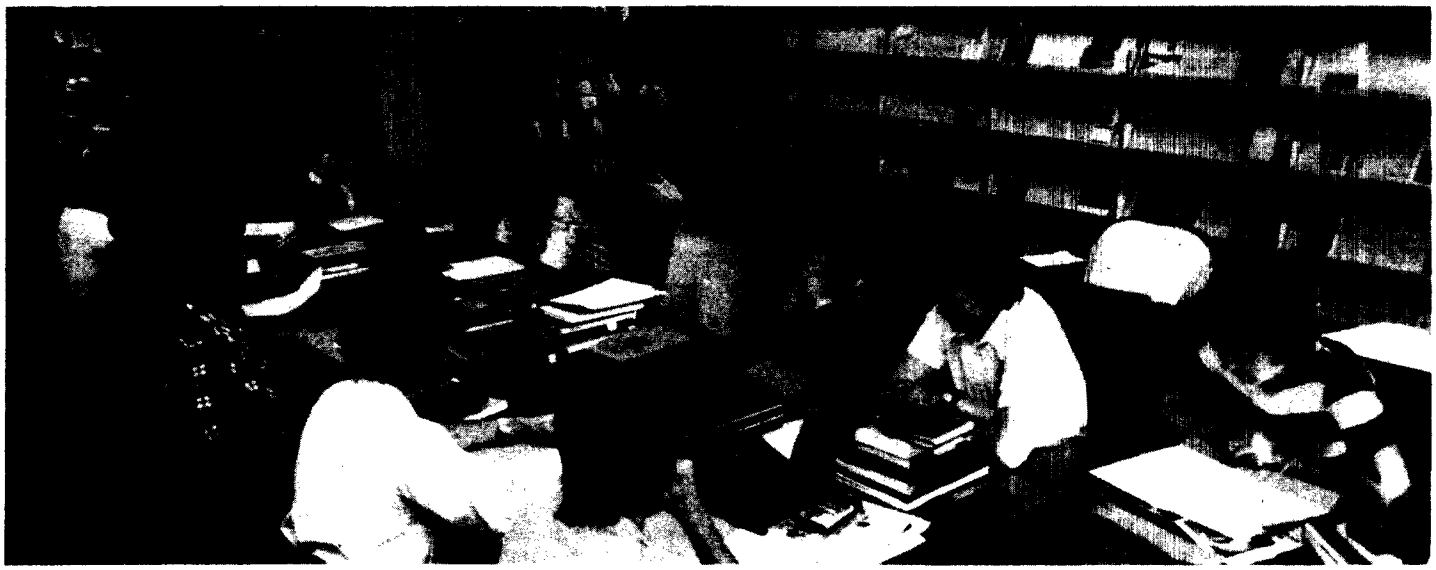
The Training and Development Centre offers specially designed conferences, seminars, workshops and intensive courses directed toward ongoing human resource development for industry, education and government. Program areas include computers, management, technology and engineering.

Those interested in professional and management development seminars should contact Part-Time Studies, BCIT, 3700 Willingdon Avenue, Burnaby, B.C., V5G 3H2. Telephone 434-5734, local 328, or the department at locals 445 and 736.

Continuing Education and Industry Services Administration

David M. Brousson, B.A.Sc., P.Eng., Dean
Atley W. Morrow, B.A., M.Ed., Acting Associate Dean
Jacquie Jones, Dipl. T., Acting Department Head, Business Continuing Education
Patrick M. O'Reilly, B.Sc., Department Head, Engineering & Core Continuing Education
Patricia D. Wolczuk, M.Sc., Department Head, Health Continuing Education
William D. Robertson, B.Ed., M.A., Department Head, Distance Education
Eric A. Morse, B.Sc., B.Ed., Acting Department Head, Industry Services
Robert L. Jamieson, B.A., Manager, Training and Development Centre
C.J. Dukowski, B.A., M.Ed., Manager, Downtown Education Centre

Library Services Division



As a major technological information resource center in British Columbia, the BCIT Library contains current books, periodicals, maps, research reports and literature indexes supporting all technologies. In addition there are over 1500 films and 2000 learning kits and audiotapes. The Listening and Viewing facilities include preview booths, slide tape units, video monitors and microform viewers to make use of these media resources. As added features there are two computer-assisted instruction terminals in the area and four microcomputers available to students interested in using the Library's growing collection of programs.

The curriculum at BCIT provides for five hours a week for library use and research. The opportunity to become familiar with information sources in a chosen field and to develop research skills assists the technologist not only in completing course assignments but also in facing the future challenge of keeping current in a changing and innovative work environment.

A self-guided tour and a video program of soundtape explaining the use of the microcatalogue for locating materials, provide the basis of library usage. Printed guides to various information sources are available from display racks in the Library Guide area. Class seminars are given by the subject specialist on request from an instructor at the time of the first major research assignment. In addition, librarians are always on hand to answer individual queries.

Quick Facts about the Library Services Division

Hours: Sept. - May (subject to change)

Library	
Mon.-Thurs.	8 a.m. - 10 p.m.
Fri.	8 a.m. - 5 p.m.
Sat. & Sun.	10 a.m. - 6 p.m.
Listening & Viewing	
Mon. - Thurs.	8 a.m. - 6 p.m.
Fri.	8 a.m. - 5 p.m.

Holiday hours will be posted.

Book Replacement Fee: Levied 30 days after due date, the non-refundable fee covers the purchase and processing of a replacement copy long overdue and unavailable to other borrowers. It is payable to the Finance Division, 1A Building.

Penalties: Failure to pay the book replacement fee results in suspended library privileges. No statement of marks, diploma or certificate is issued until the student settles all financial obligations for overdue material.

Faculty and Staff

Administration

Jos. E. Carver, C.D., B.A., B.L.S., *Dean*
Joyce McEwan, Secretary to the Dean

Library:

Robert A. Roy, B.A., M.A., B.L.S.,
Library Department Head
Margot Allingham, B.A., M.L.S.,
Reference Librarian
Sheila Ferry, B.A., B.L.S.,
Reference Librarian
Tony Kelly, B.A., M.L.S.
Reference Librarian
Frank Knor, Dipl.T., B.Ed., B.L.S.,
Reference Librarian
Trish Labonte, B.Sc., M.L.S.,
Reference Librarian
Merilee KacKinnon, B.A., M.L.S.,
Cataloguer
Marj McLeod, B.A., B.L.S.,
Reference Librarian
Paula Pick, B.A., M.L.S., Head Cataloguer
Gerry Weeks, B.A., M.L.S.,
Reference Librarian
Robert Young, B.Sc., M.L.S.,
Reference Librarian

Admissions

Note: An Integrated Student Information System (ISIS) is being introduced effective the 1984/85 academic year. This may impose revisions in certain administrative policies and procedures without prior notice. The course numbering system as presented in this calendar will also be changed. During the period of transition, inconvenience will be kept to a minimum and ultimately BCIT students will be better served.

Admissions Policy

BCIT was built to serve the residents of British Columbia. The selection of applicants is on a "first-come, first served" basis, provided the applicant meets the necessary Institute and technology prerequisites.

British Columbia residents who are Canadian citizens and landed immigrants who have resided in B.C. for at least one year prior to enrolment have first priority; out-of-province Canadian citizens and landed immigrants who have resided in Canada for at least one year prior to enrolment, have second priority. Out-of-country applicants on a student visa, which is designated BCIT, have third priority. Out-of-country candidates are only selected when there is a lack of applications from the first two priorities. Due to limited enrolment, out-of-country applicants on a student visa are only considered for admission to Biological Sciences, Chemical Sciences, Civil and Structural, Forest Products, Mechanical, Mining, Natural Gas and Petroleum and Surveying. *This policy is currently under review.* BCIT does not accept applications from persons on visitor's visas.

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

Academic Requirements for Admission

Graduation from a senior secondary school in a Selected or Combined Studies Program or equivalent, with satisfactory grades, as prescribed by the British Columbia Ministry of Education, is required. In addition, candidates must meet certain special technology prerequisites. See *Technology Prerequisites.*

English Language Proficiency

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

1. by scoring a minimum of 115 on the Vancouver Community College English Language Assessment Test;
2. by scoring a minimum of 550 on the TOEFL;
3. by completing Academic English 12 (B.C.) with a C+ or better; English 12 ME is not acceptable;
4. by successfully completing English 099, at Vancouver Community College; or equivalent, or;
5. by individual assessments of the English Department.

To obtain a bulletin of information which outlines world-wide test locations and application procedures, applicants are advised to direct their enquiries to: *Test of English as a Foreign Language*, Box 889, Princeton, New Jersey, 08540, U.S.A.

Mature Student Entry

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

Transfer Students

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

Direct Entry

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

Technology Prerequisites

Business Management Division

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

Broadcast Communications — Graduation from the Selected or Combined Studies Program is a general prerequisite

Broadcast Engineering — Graduation with a National Diploma of Technology in electronics, or equivalent work experience

Business Administration — Graduation from a BCIT diploma program or a two year college program in an engineering or health technology or equivalent

Computer Systems — Graduation from Grade 12 with at least a B+ average including Algebra 12 with an A, English 12 and Physics 11 or 12 each with a B, and at least 4 other Grade 12 academic courses from areas such as science, history, and language.

Financial Management — Algebra 11

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

Marketing Management — Algebra 11 and English 12 with a C+ standing or better)

Operations Management — Algebra 11 or Math 11

Engineering Division

Biological Sciences

Biological Sciences Program — Algebra 12 or Math 12* and Chemistry 11; Agriculture Management Program — Algebra 11 or Math 11

Building — English 12, Algebra 12 or Math 12* plus Physics 11 (all with a C+ standing or better)

Chemical Sciences — Algebra 12 or Math 12* and Chemistry 11.

Civil and Structural — Algebra 12 or Math 12* and Physics 11

Electrical/Electronics — Algebra 12 or Math 12*, Physics 11 and Chemistry 11 (all with a C+ standing)

Forest Resource

Algebra 11 with C+ or better and a science 11 (Biology required for fish, wildlife, and recreation, and preferred for forestry) and a science 12 (Algebra, Geometry, Probability and Statistics, Computer Science, Physics) with a C, or Physics 11 with a C+.

Lumber and Plywood — Algebra 12 or Math 12* and one science 11 (Biology, Chemistry or Physics)

Mechanical — Algebra 12 or Math 12* and Physics 11

Mining — Algebra 12 and Math 12*, Phsysics 11 and Chemistry 11

Natural Gas and Petroleum — Algebra 12 or Math 12* and Physics 11 or Chemistry 11

Recreation Facilities Management — Algebra 12 or Math 12* and Physics 11

Surveying — Algebra 12 or Math 12* and Physics 11

Health Division

Biomedical Electronics — Algebra 12, Physics 11, Chemistry 11

Diagnostic Medical Sonography — Completion of a two year allied health program such as Radiography, Nuclear Medicine or General Nursing, or a Bachelor of Science or equivalent in a health-related science

Environmental Health — Algebra 12, or Math 12*, Physics 11 and Chemistry 12

General Nursing (R.N.) — Chemistry 11 and either Chemistry 12 or Biology 12 (each with a C+ standing), Algebra 11 and English 12 (each with C standing). The St. John Ambulance Standard First-Aid certificate is required by the end of term 1

Health Information

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

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

Medical Laboratory — Algebra 12 or Math 12* Chemistry 11 and 12 and Physics, 11, Biology 12 is an advantage

Medical Radiography — Math 12*, Algebra 12 or Algebra 12 (honors), two science 11s and a science 12 (Physics 11 preferable). (Graduation with a C+ standing or better).

Nuclear Medicine — Math 12*, Algebra 12 or Algebra 12, honors (post June 1978), Chemistry 11 and 12 and one science 11. (Graduation with a C+ standing or better)

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

Prosthetics and Orthotics — Algebra 12 and Physics 11. Courses in metalwork and woodwork are recommended

Psychiatric Nursing (R.P.N.) —Chemistry 11 and either Chemistry 12 or Biology 12. (C+ standing preferred). The St. John Ambulance Safety-Oriented First-Aid certificate or equivalent is required by the end of term 1 and a Cardio Plumonary Resuscitation course must be completed prior to term 3.

***Important**

Where a math course requirement is specified in the Engineering and Health Divisions, please note that Math 12 completed after 1978 and general math 12 is not an acceptable prerequisite.

The only acceptable math prerequisite courses are Math 12, successfully completed in 1978 or earlier, or Algebra 12. English 12 Minimum Essentials is not an acceptable prerequisite for entry into BCIT.

Basic Training for Skills Development Upgrading—Level 4

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

General Educational Development Tests

These tests are designed for people who have not completed high school graduation but who, because of experience, have presumably reached a level of general development equivalent to high school graduation. Unfortunately, whatever the general development a person may have accomplished, mathematical and science ability and knowledge may not necessarily have been strengthened. Therefore, success in the General Educational Development Tests is considered to be equivalent to BCIT general prerequisites; that is, graduation from a senior secondary school. Applicants who are successful in these tests are required to achieve satisfactory standing in the special prerequisites specified by the technology they have applied to.

How to Make up Course Deficiencies

Summer and spring preparatory programs are available through the BCIT Continuing Education Division for those students who lack specific prerequisites or who desire refresher courses. For information, please contact Continuing Education at 434-5734, local 204 or 205.

How to Apply

Applications for admission to a technology or option should be submitted as early as possible, as some programs at BCIT have a limited number of seats available. Application forms and additional information may be obtained from the Office of the Registrar, BCIT, 3700 Willingdon Avenue, Burnaby, B.C., V5G 3H2, phone 434-5734, local 216. These forms should be completed and returned with the necessary **official** documents attached. See Document Requirements.

When to Apply

Applications for classes commencing in September will be accepted by the Registrar's Office from January 1 to the second week of September.

Applications for Psychiatric and General Nursing:

August Session

Applications for the August session will be accepted from January 1 to 14 days after the commencement of classes.

January Session

Applications for the January session will be accepted from June 1 to 14 days after the commencement of classes.

Applicant Status Categories

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

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

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

Wait Lists — When all seats in an option or technology are filled, a wait list of qualified applicants is generated. If a space becomes available, an applicant on the wait list will be given the seat.

We encourage applicants to contact Admissions who may suggest other similar technologies in which seats are available.

Non-Acceptance — The applicant does not meet the requirements of the Institute and/or the technology.

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

Acceptance is non-transferable from year to year. Applications are considered for the current school year only.

Document Requirements

The following official documents must accompany the completed application form (photocopies are not acceptable):

1. A senior secondary school transcript of marks or, if this is unavailable, an interim statement of marks from the principal of a senior secondary school indicating that the applicant is expected to obtain the required academic standing upon completion of grade 12 on the Selected or Combined Studies Program. This interim statement of marks must be substantiated by a final secondary school transcript of marks when it becomes available.
2. If applicable, all post-secondary school statements of marks indicating credits and grades achieved.
3. Out-of-country applicants must submit official government documents indicating Landed Immigrant Status or Student Visa designated for BCIT. Transcripts and all other related academic documents must be translated into English and notorized at the applicants' expense.
4. Health Division applicants are required to complete a medical questionnaire and return it to the Medical Services Department at BCIT. Some of the health technologies require their students to present evidence of having had a recent chest x-ray as well as having completed an immunization program. If, due to extenuating circumstances, supporting documentation is not available at the time, students will be required to complete the necessary procedure at Medical Services.
5. Students who have been selected for admission must have medical insurance coverage prior to registration.

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

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

Course Credit and Advanced Standing

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

Guidelines

a) first year students may only apply for course credit after they have been fully accepted and paid their commitment fee.
b) second and third year students, who are direct entries to BCIT, may apply for course credit upon receiving full acceptance.
c) students who are presently enrolled at BCIT may apply for course credit at any time within the specified schedule.

Course credit may be applied for each term or on an academic year basis.

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

If course credit is granted, students will not be eligible for BCIT scholarships. However, BCIT bursaries and government grants are available to students carrying at least a 80% class workload. Each student must carry a 75% class workload in order to be registered as a full-time day school student. If a second year student receives course credit in one or more subjects during second year, he/she will not be eligible to receive an honors diploma unless another approved course is substituted to maintain class workload at 100%.

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

Readmissions

Students may interrupt their studies after the completion of any term. However, an application form must be completed and submitted to the Office of the Registrar. Acceptance is based on the availability of seats in the technology and applications should be submitted at least one month prior to the date of the commencement of the term.

Change of Program

After a student has enrolled in a technology, a request for technology transfer requires the completion of a Request for Transfer form by the student. It is the responsibility of the student to obtain approval and signatures from the appropriate department head, Dean and Registrar. Permission must be granted by the Board of Admissions before a change in program can be affected.

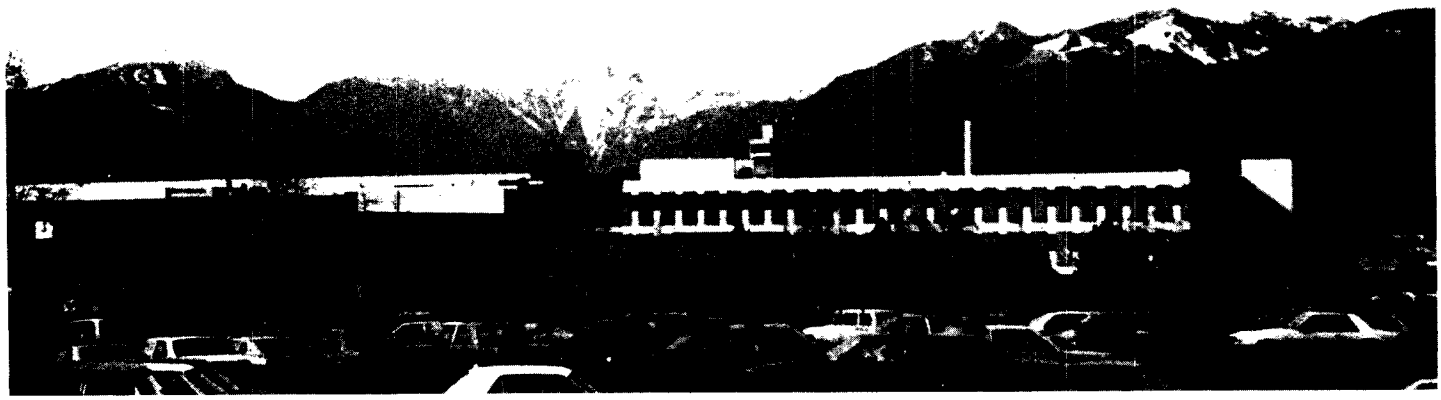
Changes in Curricula and Regulations

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

Staff — Office of the Registrar

Gordon Kenyon, Registrar (Acting)
Cindy Innes, Registrar's Secretary

Fees and Expenses



Fees For 1984/85 Academic Year

Annual Fees

Please note that fees are subject to increase by action of the British Columbia Institute of Technology Board of Governors.

Tuition fees are reviewed annually. Based on 1983/84 fee structure, the following will be the minimum fees for 1984/85 academic year:

Annual Fees	1st Year	2nd&3rd Year
General Tuition	$ 970	$ 970
Student Activity (annual)	65	65
Convocation (mandatory)	—	11
Total	$ 1,035	$ 1,046

Annual fees may be paid in full or by term.

First year students

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

First term fees (due 60 days before commencement of classes)
General tuition (includes $75 non refundable commitment fee) $ 485
Student activity fee 65
$ 550

Second term fees (due first week of the term)
General tuition $ 485
First year total $1,035

Second and third year students

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

First term fees (due 30 days before commencement of classes)
General tuition $ 485
Student activity fee 65
$ 550

Second term fees (due first week of the term)
General tuition $ 485
Convocation fee 11 $ 496
Second and third year total $1,046

One term only

Term 2 readmissions (due at Registration)
General Tuition $ 485
Student Activity 35
Term 2 total $ 520

Term 4 readmissions (due at Registration)
General Tuition $ 485
Student Activity 35
Convocation 11
Term 4 total $ 531

Term 5 General and Psychiatric Nursing (due 30 days before classes)
General Tuition $ 485
Student Activity 35
Term 5 total $ 520

Electrical Technology (for each Trimester (Level) 1, 2, 3 & 4)
General Tuition $ 485
Student Activity 22
Total $ 507

Electrical Trimester Level 5 only:
General Tuition $ 485
Student Activity 22
Convocation 11
Total $ 518

NOTE:
Level 1 Fees are due 60 days prior to the commencement of classes.
Level 2 Fees are due during the first week of classes.
Level 1 and 3 Students entering in May 1984 will pay according to this Fee Schedule.

Health Record Technician

First Term (due 60 days prior to the commencement of classes)
Commitment Fee $ 75
Fall Term 410
General Tuition $ 485
Student Activity 65
Fall Term Total $ 550

Second Term (due first week of classes)

General Tuition	485
Convocation	11
Total	$ 1,046

Financial Obligations to the Institute

No statement of marks, diploma or certificate will be issued until the student has cleared up all financial obligations to the Institute.

Additional Expenditures

Textbooks, instruments and supplies

The costs vary according to the program and are approximately $150 to $200. The Institute bookstore carries a complete line of drafting and writing supplies. Students are advised not to make any purchases until they have received a book list showing the required texts. Some technologies require purchase of a pocket calculator costing approximately $150 to $250.

Field trips

In some technologies, periodic field trips are part of the program. These expenses are the responsibility of the student. Accommodation and food costs vary from $25 to $100.

Tuition Policy

First year students

1. A non-refundable commitment fee of $75 is due and payable upon an applicant's full or provisional acceptance. This fee is applied toward the tuition fees for the first term of studies.
2. An accepted applicant whose commitment fee has not been paid within 30 days of acceptance will forfeit the seat which has been reserved.
3. An accepted applicant is required to pay the remainder of full first term fees 60 days before the commencement of classes, or make other suitable arrangements with the Comptroller.
4. An applicant accepted less than 60 days before the commencement of classes is required to pay full first term fees upon acceptance, or make other suitable arrangements with the Comptroller.

Second year students

A student returning to begin the second year of a two-year program is required to pay full term fees 30 days before the commencement of classes.

Payment of tuition fees for subsequent terms

Both first and second year students returning for a subsequent term; e.g., term 2, are required to pay full fees during the first week of the term.

Cancellation of registration for non-payment

A student whose fees are outstanding will be excluded from classes and have his or her registration cancelled. Reinstatement of admission will only be considered if seats remain available in the technology. An additional $10 will be levied for reinstatement to classes.

Payment

All cheques and money orders should be made payable to the "British Columbia Institute of Technology" or "BCIT". A charge of $10 will be levied for costs of handling cheques returned because of insufficient funds or for other reasons. Payments may also be made by Chargex (Visa) or Mastercharge credit cards.

Refunds of fees for first year students who withdraw up to 14 days after the commencement of classes:

General Tuition: Complete refund, less $75 commitment fee.

Student Activity Fee: complete refund.

Refunds of fees for first year students who withdraw from the day following the last day specified above until the end of term.

General Tuition: no refund.

Student Activity Fee: a refund of $3 per month for each full month the student is not in attendance and has officially withdrawn from BCIT. (The maximum repayable would be $30.)

No refunds of student activity fees will be made after the last day of February. The refund must be claimed in writing from the BCIT Student Association office and the student's ID card(s) turned in on receipt of the refund. Withdrawal verification will be made by the BCIT Student Association before processing the claim.

An official income tax receipt is mailed by the Finance Office by February 28. A nominal charge will be levied for duplicate receipts. For income tax purposes students may claim their tuition fees on either an academic or calendar year basis."

How to withdraw

Students are required to withdraw officially from BCIT by reporting to the Counselling Centre.

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

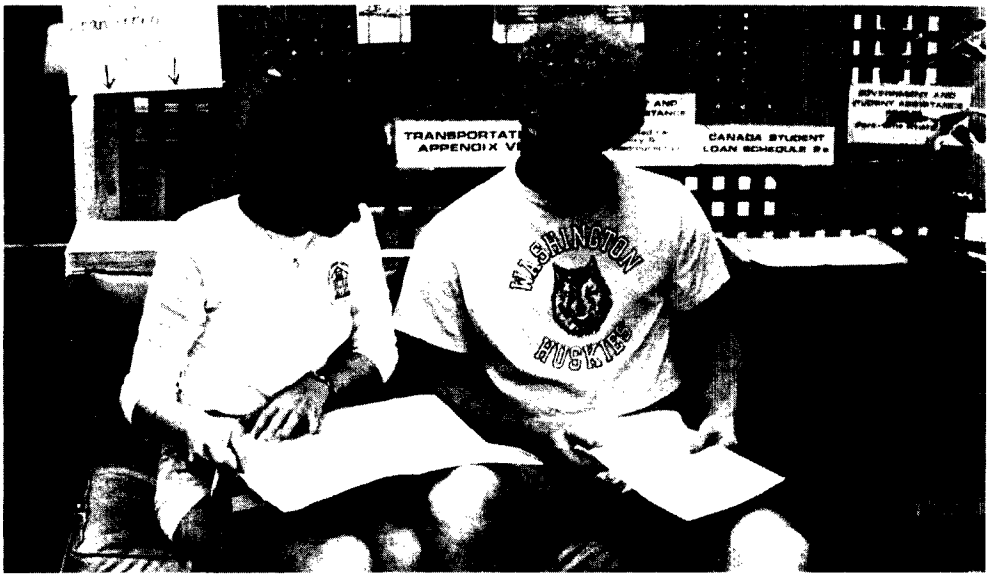
Miscellaneous Fees

Reread or appeal of examination (per subject)	$10
Transcript of marks (per copy)	$ 3
Duplicate of diploma (per copy)	$ 6

(A duplicate diploma will be issued only when written confirmation of loss of the original diploma has been submitted to the Registrar).

Applications should be made through the Office of the Registrar.

Counselling and Student Financial Services



Student Financial Services

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

How Much Will It Cost

The first step in determining your total financial picture is to calculate resources and expenses. A single student not living with his/her parents can expect to spend approximately $5,000 on living expenses, $1,000 for tuition fees and at least another $500 for books and supplies. It is important that costs such as room and board, transportation, clothing, laundry and entertainment are taken into account. Each student's expenses will vary depending on their individual circumstances. For instance, a married student with dependents will have higher living costs than a single student living at home. To estimate total resources, you should take into account such income generating sources as summer employment, savings, parental contribution, and part-time earnings while attending school.

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

B.C. Student Assistance Program

This government-sponsored program is the major source of financial assistance for post-secondary students. The maximum assistance a student is eligible for varies according to program length and whether a student is single, married or has dependents. Based on 1983/84 guidelines, a single student or married students without children enrolled in the average 36 week BCIT program are eligible for up to $5,600 in assistance ($3,600 in loan and $2,000 in non-repayable grant). Single parents or married students with children, enrolled in a 36 week BCIT program are eligible for up to $6,000 in assistance ($3,600 in loan and $2,400 in non-repayable grant). **Please note**, these figures are maximums; the amount actually received is determined by a need assessment of each applicant's circumstances.

Students who require funds at the beginning of the academic year should apply at least 3 months before the start of classes.

Ministry of Health Bursaries

Students entering a Health Division Program (excluding Environmental Health), may be eligible for a Health Bursary. If financial need is assessed as greater than the maximum available through the B.C. Student Assistance Program, the Ministry of Health will provide additional funds to a maximum of $50 for each week of the educational year.

Please note, **no separate application** is required. Students are automatically considered for a Health Bursary when applying to the B.C. Student Assistance Program.

Work Study Program

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

Positions are posted at the Canada Employment Centre beginning in September.

BCIT Bursaries

BCIT Bursaries are non-repayable awards ranging from $50 to $1000. These bursaries are made possible through contributions from private companies, organizations and individuals to the BCIT Scholarship and Bursary Fund. See page 139 for a list of contributors.

To be considered for a Bursary, students must demonstrate financial need, have an overall average of at least 60%, and have a clear pass in all subjects. Consideration is also given to voluntary services a student provides to the Institute or the community.

Students are eligible to apply only after successful completion of at least one term. The deadline for application is January 20.

Emergency Services

Short-term interest-free emergency loans are available to assist students in meeting essential living and educational expenses. Students are expected to have exhausted all other possible financial resources, including family loans, before being considered for an emergency loan. These loans (maximum **$500**) are **only** granted to students who are able to repay them from a specified source within a short time period.

For further information, telephone **434-5734, local 890,** or visit the Counselling Centre, Room 205, Building 2N.
Office hours, Monday - Friday are:

September - May	0830 - 1630
June, July, August	0800 - 1600
(subject to change)	

Counselling

The Counselling Services centre offers a free and confidential career counselling service to all BCIT and prospective students. Professionally trained counsellors will assist students in selecting a career, making a career change, re-entering the work force, or adjusting a career to fit a chosen style of living.

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

Counselling Services, in conjunction with Continuing Education, offers several *Career Search Workshops* during the school year. *These workshops are four* sessions (12 hours) long and are designed primarily for prospective students who have *been in the work force at least two years.* Participants examine their career paths and lifestyles in terms of direction and personal satisfaction. Registration for Career Search Workshops is handled through **Continuing Education** in the Admissions general office. For more information call 434-5734, **local 204 or 205.**

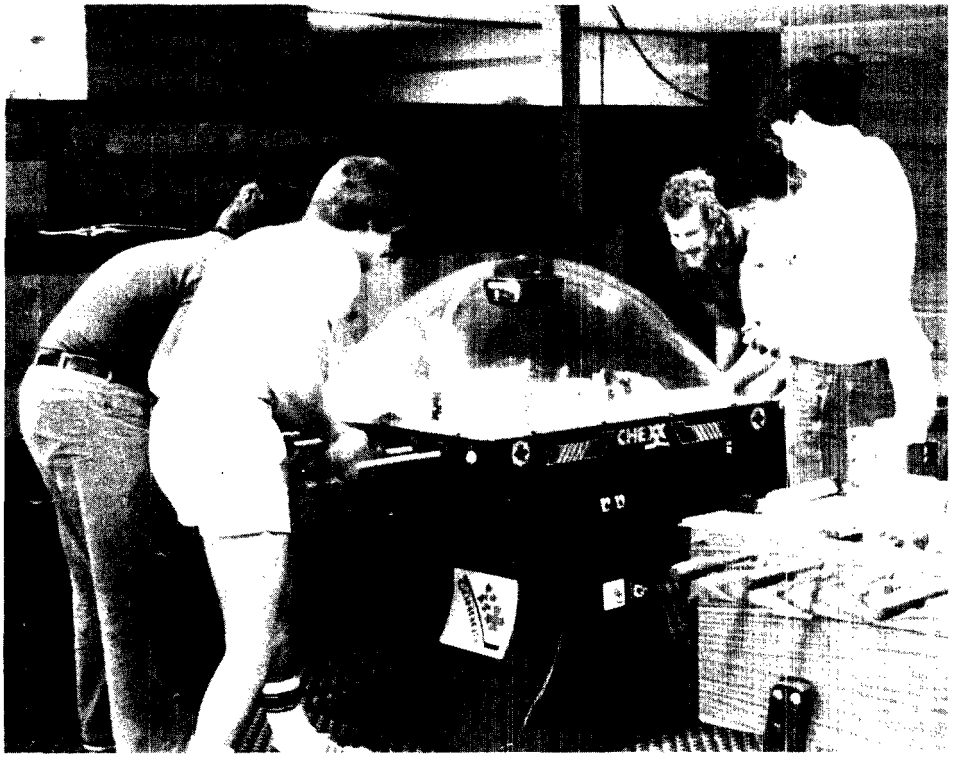
Supportive counselling to BCIT students during times of stress or change is also available through Counselling Services. It may take the form of direct service to the student or referral to the appropriate campus or community agency.

For further information about any of the counselling services at BCIT, contact the **Counselling Services** centre in room 205, building 2N, or telephone 434-5734, *local 327.* The centre is open Monday to Friday, 0830-1600, September to May, and 0800-1600 June, July, August.

Prospective students should make appointments to attend the group information sessions.

Staff

Al McLean, B.A., B.S.W., M.S.W., Director
Counsellors:
Stu Gibbs, B.A., M.S.Ed.
Dr. Norma Hawkes, B.A., M.Ed., D.Ed.
Rick Irving, B.Ed., M.Ed.
Jennifer Orum., B.Ed., M.A.
Howard Peto, B.S.A., M.Ed.
Jack Say Yee, B.A., B.S.W., M.S.W.



Examinations and Marks

Examinations
Formal examinations are written at the end of each term.

Return of Examinations
Mid-term and Christmas examination papers may be returned to students ten school days after the official Institute distribution schedule for the statement of marks. Only those examinations designated as "restricted exams" by the Dean shall not be returned.

Determination of Standing
Final standing is determined on the basis of term progress and examination results. Students' subject standing are reviewed by a Divisional Marks Review Committee where final standing is determined. Subject standing is as follows:

1 - First class ..... 80% or more
2 - Second class ..... 65% to 79%
3 - Pass ..... 50% to 64%
4 - Failure ..... less than 50% or unapproved/unofficial withdrawal from subject or program

When an "F" appears beside the "average of current term" marks, it indicates one of the following:

1. A failure in one or more subjects.
2. A failure in the entire term.
3. A withdrawal after the deadline. (Refer to section on Withdrawal from Program Courses).

Therefore, a student whose transcript bears such a standing (i.e. "F") is generally not permitted to proceed to the next term unless granted special permission by letter from the Registrar, after approval of the Divisional Marks Review Committee.

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

C - Course Credit Granted
Recognition of an acceptable level of studies taken in a specific subject area.

PP - Provisional Pass
Standing granted on the basis that the student will reach pass standing in the continuing or other designated course.

P - Provisional Pass Fulfilled
Standing granted on the basis that the student has fulfilled the requirements of the provisional pass.

AP - Adjudicated Pass
Subject standing unconditionally raised to a pass level permitting the student to continue in the program based upon overall performance.

N - Not Complete
Student did not complete subject requirements.

X -
No examination or grade given for this subject.

S - Satisfactory
Subject requirements fulfilled, no mark assigned.

U - Unsatisfactory
Subject requirements not fulfilled, no mark assigned.

AU - Audit
Student attended course, no credit given.

W - Withdrawal
Approved withdrawal from a program or a course within a program.

Withdrawal from Program Courses
A full-time student withdrawing from one or two courses without permission will receive an "F" on his/her transcript. Withdrawal **with** permission from his/her department head or dean will show a "W" on the transcript. Appeals to the Registrar will be adjudicated by the Registrar and the Division Dean.

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

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

Distribution of Transcripts
Students will not be provided with marks prior to the issuance of an official transcript by the Registrar's Office.

Transcripts including the result of December examinations will be distributed to students by the Deans' offices.

Note: A student who has failed a term ending in December will be advised by telegram prior to the commencement of the next term. A letter together with the student transcript follows the telegram.

Transcripts resulting from May examinations for all divisions are mailed to students by the Registrar's Office.

Additional Transcripts

A fee of $3 is charged for each additional transcript of an undergraduate's or graduate's statement of marks. The fee is due at the time the request is made.

Withholding Statement of Marks

No statement of marks, transcript, diploma or certificate will be issued until the student has cleared up all financial and other obligations to the Institute in the way of fees, overdue library books or outstanding fines. These documents may also be withheld on such other grounds as the Board of Governors may from time to time direct.

Rereads and Reassessments

Requests for rereads or reassessment of an academic standing should be submitted in writing to the Registrar's Office within two calendar weeks of the official Institute transcript distribution date. There is a fee of $10 for each subject reread or reassessment. If the mark or standing is favourably adjusted, the fee will be refunded. The Registrar will inform the student of the results of the reread or reassessment.

Appeals

It is the policy of the Institute that students shall be dealt with fairly in all decisions affecting their academic standing. A student who wishes to appeal an academic standing may do so by submitting to the Registrar, in writing, the reasons for and the desired result of the appeal. The student has one calendar week to appeal an unsuccessful reassessment or reread. A student who had been permitted to audit classes during the reassessment procedure may continue to audit during the appeal procedure (including the week prior to deadline for submitting the appeal). The student must provide with his/her letter of appeal a written statement from the Dean indicating that he/she has met with the Dean of the Division in an attempt to resolve the situation giving rise to the appeal.

The appeal must be accompanied by a $10.00 fee, returnable in the case of a successful appeal.

On notification by the Registrar of an appeal, the President shall convene the Appeals Committee.

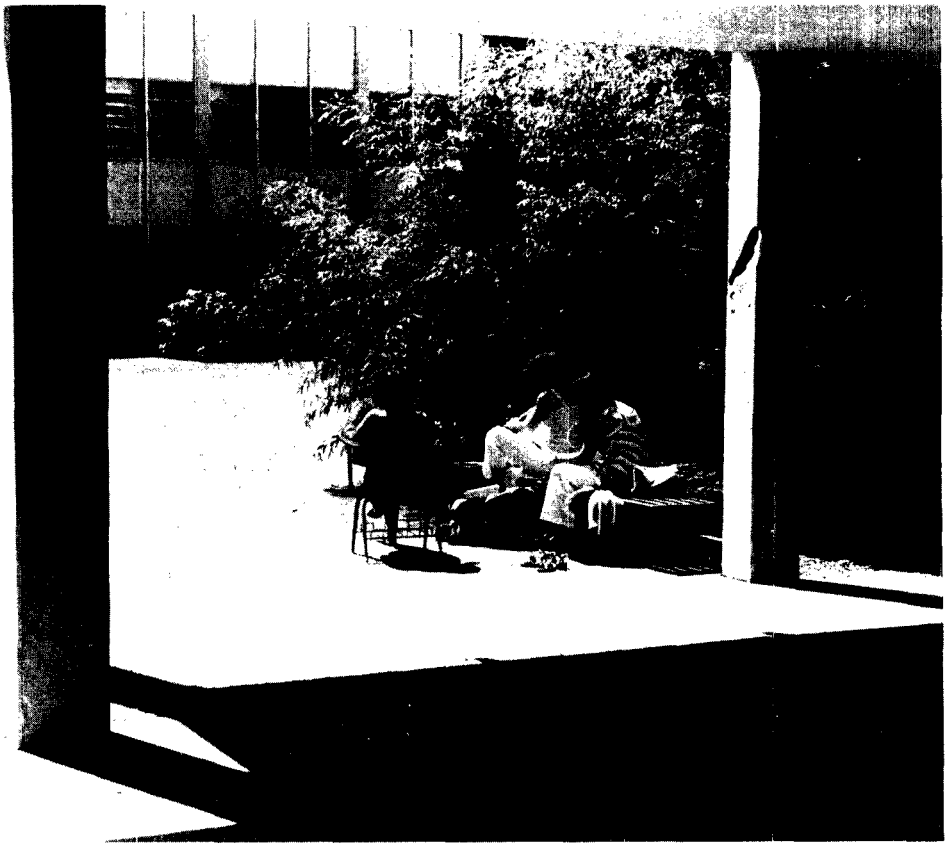
Decisions rendered by the appeal panel composed of members of the Student Appeals Subcommittee of the Educational Council with regards to such appeals shall be final and binding.

Failures and Repetition

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

Student Research Reports

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



Diplomas

Diploma of Technology

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

Honors Diploma

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

Students who have been granted course credit or advanced standing for second year courses while in attendance at BCIT will not be eligible for Honors Diploma status, unless approved courses are added to maintain 100% workload.

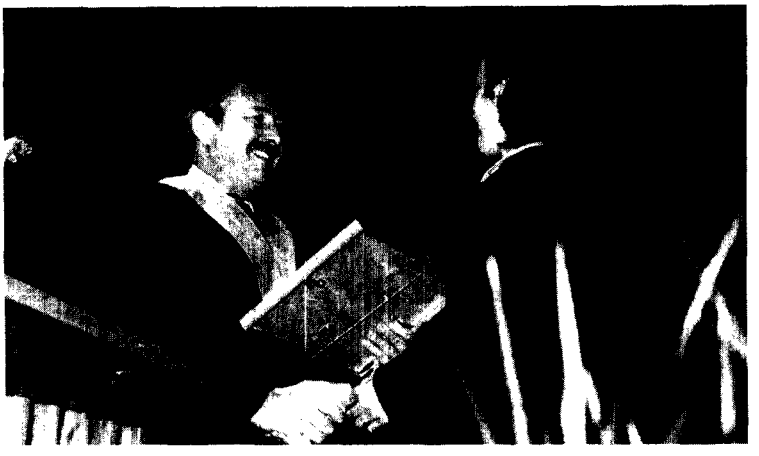
Double Diploma

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

Replacement Diploma

Only one diploma will be issued to each student. Should a student request a copy because of loss a "Request for a Replacement Diploma" form must be completed and returned to the Office of the Registrar. Upon review of the reason for the loss, the Registrar may issue a replacement diploma. There is a $6 charge for issuing a replacement diploma.

Graduating Awards



Honor Awards

Five honor awards are presented at *convocation*:

The **Governor General's Silver Medal** is presented to the top academic student in his or her graduating class year. Graduates from the previous year of August Nursing and Nuclear Medicine classes are also considered.

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

The **President's Award** is presented to a student for outstanding personal contribution to BCIT.

The **Deans' Award** is presented to the most outstanding academic student in each of the three divisions: Business, Health, and Engineering.

The Lieutenant Governor's Silver Medal is awarded to a student who has completed the requirements for at least one certificate through Continuing Education and Industry Services Division, not necessarily in the current academic year. The student should be a part-time student in Continuing Education and Industry Services Division; taking courses in the current academic year; contributed in a positive way to the life of the Institute and the community at large; and have an excellent academic record.

Academic Awards

Academic Awards, sponsored by private organizations, are presented annually to students who achieve the highest academic standing in his or her program of studies. The following awards were presented at the 1983 Graduating Awards Ceremony:

BUSINESS MANAGEMENT DIVISION

Administrative Management

The Bank of British Columbia Award in Administration ($400)

The Finning Tractor & Equipment Co. Ltd. Award in Personnel and Industrial Relations ($500)

The Business Administration Award.

Broadcast Communications

The British Columbia Association of Broadcasters' Award.

Computer Systems

The Computer Systems Award in Information Systems.

The Computer Systems Award in Management Systems.

Financial Management

The Canadian Life Insurance Association Award in Insurance ($200)

The Society of Management Accountants of British Columbia Award in Accounting

The Royal Bank of Canada Award in Finance

Hospitality and Tourism Administration

The British Columbia Hotels' Association Award in Hotel, Motel and Food Services ($150)

The Travel and Tourism Award ($100)

Marketing Management

The Bank of British Columbia Award in International Business ($400)

The Real Estate Council of British Columbia Award in Real Estate ($300)

The Vancouver Sun Award in Marketing ($250)

The Canadian Tire Award in Advertising and Sales Promotion ($300)

Operations Management

The Vancouver Transportation Club Award in Transportation and Distribution ($150)

The Operations Management Faculty Award for Academic Excellence

ENGINEERING DIVISION

Biological Sciences

The British Columbia Federation of Agriculture R.B. Stocks Award in Agricultural Management ($200)

The British Columbia Nursery Trades Association Award in Landscape Horticulture ($100)

The Canadian Agricultural Chemical Association, B.C. Section Award in Food Production ($100)

The Fisheries Association of British Columbia Award in Food Processing ($100)

Building

The Architectural Institute of British Columbia Award in Architecture ($200)

The Building Award in Economics.

The Building Award in Mechanical Systems.

Chemical Sciences

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

The Canadian Pulp and Paper Association, Technical Section, Pacific Coast

and Western Branches Award in Pulp & Paper ($200)
The Canadian Society for Chemical Technology Award in Organic Chemistry ($50)
The Chemical Sciences Award in Pollution Sciences ($100)
The Chemical Sciences Award in Physical Metallurgy ($100)

Civil and Structural
The Swan Wooster Engineering Company Limited, Col. W.G. Swan Award ($400)

Electrical
The Microtel Pacific Research Award in Telecommunications ($200)
The Federal Pioneer Ltd. Award in Power ($200)
The Instrument Society of America Award in Instrumentation
The MacDonald, Dettwiler and Associates Limited Award in Control Electronics ($100)

Forest Products
The Council of Forest Industries Award ($200)

Forest Resource
The Council of Forest Industries Award in Forestry ($200)
The Forest Resource Award in Fish, Wildlife and Recreation

Mechanical
The Canadian Manufacturers' Association Award in Production ($125)
The Canadian Society for Mechanical Engineering Award in Design
The Mechanical Contractors Association of B.C. Award in Mechanical Systems

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

Natural Gas and Petroleum
The Natural Gas and Petroleum Award

Recreation Facilities Management
The Recreation Facilities Management Award

Surveying
The Corporation of Land Surveyors of the Province of British Columbia Award

HEALTH DIVISION

Biomedical Electronics
The Biomedical Electronics Graduating Award ($200)

Diagnostic Medical Sonography
The Diagnostic Medical Sonography Award

Health Information
The Health Record Association of British Columbia Award

Medical Laboratory
The British Columbia Society of Medical Technologists Award

Medical Radiography
The British Columbia Radiological Society Award ($250)

Nuclear Medicine
The Frosst Radiopharmaceutical Division, Ralph Jamieson Award ($100)

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

Psychiatric Nursing
The Registered Psychiatric Nurses Association of British Columbia, Richard Strong Memorial Awards ($250 x 2)

Achievement Awards

Achievement Awards are awarded for outstanding achievement in specific courses, special projects or for a combination of academic ability and leadership. The following awards were presented at the 1983 Graduating Awards Ceremony:

BUSINESS MANAGEMENT DIVISION

Administrative Management
The Westcoast Transmission Company Ltd. Award ($200)
The Administrative Management Students' Award ($100)

Broadcast Communications
The British Columbia Film Industry Association, Jack Gettles Memorial Award for Creativity in Television ($100)

Financial Management
The Certified General Accountants of British Columbia Awards in Accounting (approximately $1,000 x 2)
The Financial Executives Institute, Vancouver Chapter Award ($500)
The Society of Management Accountants of British Columbia Award in Cost and Management Accounting ($500 fee remission)
The Jackson-Mapleton Award in Finance ($100)

Hospitality and Tourism Administration
The Columbia Association of Hospitality Accountants Award in Accounting ($250)
The Hotel Vancouver Award ($300)
The Inflight Food Services Association Awards ($1,770)
The Sunsational Vacations Limited Award in Travel and Tourism ($100)
The White Spot Ltd. Awards ($300 and $200)

Marketing Management
The Block Brothers Industries Ltd. Awards in Real Estate ($100 x 2)

Operations Management
The Canadian Materials Handling and Distribution Society of British Columbia Chapter, Award in Transportation and Distribution ($250)

ENGINEERING DIVISION

Building
The Clay Brick Association Award ($100)
The P.B. Ford and Company Award ($200)
The Royal Institution of Chartered Surveyors, British Columbia Group Award in Specifications and Estimating ($100)
The Quantity Surveyors Society of British Columbia Awards in Economics (fee waiver x 3)

Chemical Sciences
The Canadian Pulp and Paper Association, Technical Section, Pacific Coast and Western Branches Award in Pulp and Paper ($200)

Civil and Structural
The Dillingham Construction Ltd. Award ($500)
The Dominion Construction Co. Ltd. Awards ($200 x 2)
The Wright Engineers Ltd. Award ($250)
The Associated Engineering Services Limited Award ($450)

Electrical
The Hewlett-Packard Achievement Award
The Western Canada Telecommunications Council, R.C. Eldridge Award for Technical Writing ($175)

Forest Resource
The Canadian Institute of Forestry, Vancouver Section Award in Forestry

Lumber and Plywood
The Ralph S. Plant Ltd. Award ($250)

Mechanical
The Bingham-Willamette Ltd. Award ($200)
The Institute of Mechanical Engineers, Western Canada Branch, Commander S.M. Terry Memorial Award
H.A. Simons (International) Ltd. Award ($250)
The Wright Engineers Ltd. Award ($250)
The BCIT Mathematics Book Award

Surveying
The Dillingham Construction Ltd. Award ($500)
The Canadian Institute of Surveying Membership Award

HEALTH DIVISION

Biomedical Electronics
The Canadian Medical and Biological Engineering Society, British Columbia Chapter, Award ($200)
The Society of Engineering Technologists of the Province of British Columbia President's Award of Excellence

Medical Laboratory
The Coulter Electronics of Canada Award in Haematology
The Warner-Chilcott General Diagnostics Award for General Proficiency ($100)
The Metropolitan Clinical Laboratories Ltd. Award in Bio-Chemistry ($100)
The Metropolitan Clinical Laboratories Ltd. Award in Bacteriology ($100)
The Ortho Diagnostics Award in Immunohaematology ($50)
The Sherwood Medical Industries Inc., Paraplast Award in Histology ($120)

Nuclear Medicine
The Metropolitan Clinical Laboratories Ltd. Award ($100)

General Nursing
The Department Head's Award for Bedside Nursing

Psychiatric Nursing
The Psychiatric Nursing Department Service Award

General Awards

The BCIT Mathematics Department Award for outstanding academic excellence in Mathematics.
The Society of Engineering Technologists of the Province of B.C. Award
President's Award of Excellence

Contributors to Scholarship and Bursary Fund

The British Columbia Institute of Technology Scholarship and Bursary Fund has been established through private means to provide annual awards to deserving and needy students of the Institute.

Scholarships are presented on the basis of academic standing. Bursaries are mainly awarded for financial need, although academic standing as well as school and community involvement may also be considered. Companies, organizations or individuals interested in donating to the Scholarship and Bursary Fund should obtain further information from the Institute Development Office (local 869).

1982/83 CONTRIBUTORS

Akhurst Machinery Limited contributed a $250 scholarship to be awarded to a student in the Mechanical Technology.

The Amalgamated Construction Association of B.C. contributed a $250 scholarship for a deserving student entering the second year of the Building Technology.

American Can of Canada Limited contributed $750 for a deserving student at the Institute, to be awarded at the discretion of the Financial Awards Committee.

The American Society for Metals, contributed a $250 scholarship to be awarded to a student in the Physical Metallurgy Option of the Chemical Sciences Technology.

The Amoco (Canada Petroleum Co. Ltd.,) contributed $500 for a deserving student in the Natural Gas and Petroleum Technology, to be awarded at the discretion of the Financial Awards Committee.

Gary A. Barr Memorial Fund was established by various donors in 1974 in the amount of $7,600, the annual interest of which is to be awarded to deserving students in the Building Technology.

BC/3 (Users of IBM Systems) Trust Fund was established by various donors in 1978 in the amount of $2,500, the annual interest of which is to be awarded as a bursary to a deserving student in the Computer Systems technology.

J. Wayne Beatty contributed a bursary of $1,350 in 1981 to be awarded in yearly allotments of $250. This bursary is to be called the "Jeanne Beatty Bursary Fund".

Gordon Bell Scholarship Memorial Fund, established by various donors in 1980 in memory of Gordon Bell, Chief Instructor of the Personnel and Industrial Relations Option in Administrative Management. The annual interest on the $2,000 trust fund will be awarded to a deserving student in the Personnel and Industrial Relations Option.

The Wesley A. Bell Memorial Bursary was established by Mr. and Mrs. A.B. Bell, in memory of their late son. The $500 bursary is to be awarded to a deserving student in the General Nursing Technology.

The Birks Family Foundation contributed $1,400 for deserving students at the Institute, to be awarded at the discretion of the Financial Awards Committee.

Brinco Limited (formerly Cassiar Asbestos Corporation Limited) contributed $1,500 for three $500 scholarships to be awarded to deserving students in mining-related technologies.

The British Columbia Association of Broadcasters contributed a $700 scholarship for a deserving student in the Broadcast Communications Technology.

The British Columbia Association of Medical Radiation Technologists contribute two $250 scholarships to be awarded to deserving students in the first year of the Medical Radiography and Nuclear Medicine technologies.

British Columbia Bio-Medical Laboratories contributed a $400 bursary for a deserving student at the Institute, to be awarded at the discretion of the Financial Awards Committee.

B.C. Coal Limited (formerly Kaiser Resources Limited) contributed a $500 bursary and a $500 scholarship to needy and deserving students in the Mining Technology.

The British Columbia Council of Garden Clubs contributed a $350 scholarship to be awarded to a deserving student in the Biological Sciences Technology, Landscape Horticulture Option.

B.C. Dairy Foundation (previously known as the Vancouver Milk Foundation and the Victoria Milk Foundation) established a trust fund in 1972 by an initial contribution of $10,000 each, the annual interest to be awarded as bursaries to deserving students in the Biological Sciences Technology.

The British Columbia Floral Art Club contributed a $350 bursary for a deserving student in the Biological Sciences Technology, Landscape Horticulture Option.

British Columbia Forest Products Limited contributed $2,100 for scholarships for deserving students with the highest scholastic standings, other than those who have already won substantial awards, in the following options of the Business Management Division: Administrative Management — Administration Option and Personnel and Industrial Relations Administration Option; Financial Management — Accounting Option and Finance Option; Marketing Management — Marketing Option; Operations Management and the Transportation Management and Distribution Option or to students entering the first year of the Forest Products Technology-Lumber and Plywood Option; and the Forest Resource Technology — Forestry Option.

British Columbia Fruit Growers' Association contributed a $500 bursary for a deserving student in the Biological Sciences Technology. This shall be known as the Rob Hall Memorial Bursary.

The **British Columbia Hotels' Association** contributed $1,750 for two $250 scholarships and five $250 bursaries to be awarded to students in the Hospitality and Tourism Administration Technology.

British Columbia Hydro and Power Authority contributed $5,000 for scholarships to be awarded to students in the Electrical, Natural Gas and Petroleum, Mechanical and Civil and Structural technologies, or to students in other engineering programs having a direct interest in a public utility.

The British Columbia Lung Association contributed a $500 bursary to be awarded to a deserving student in the General Nursing Technology. The bursary is to be referred to as the Helen Findlay Memorial Bursary.

B.C. Recreation Facilities Association contributed a $300 bursary known as the J. (Joe) Dukowski Memorial Bursary, to be

awarded to a deserving second year student in the Recreation Facilities Management Technology.

B.C. Society of Landscape Architects contributed a $200 scholarship to a deserving student in the Biological Sciences Technology.

The British Columbia Sugar Refining Company Limited contributed $500 for deserving students at the Institute, to be awarded at the discretion of the Financial Awards Committee.

British Columbia Telephone Company contributed two bursaries of $500 each, for two deserving students at the Institute to be awarded at the discretion of the Financial Awards Committee.

British Columbia Television Broadcasting Systems Limited contributed $300 for a deserving student at the Institute in Broadcast Communications.

B.C. Timber (formerly Canadian Cellulose Company Limited) contributed $1,000 for entrance scholarships for students entering the first year of the Lumber and Plywood Option of the Forest Products Technology and the Pulp and Paper Option of the Chemical Sciences Technology.

British Columbia Wharf Operations' Association contributed $1,000 to be awarded to students, who are sons or daughters of members of B.C. Wharf Operations Association, who demonstrate financial need and are involved in a transportation-related technology.

Ernie Brown Memorial Fund in the amount of $2,000 was established in 1979 by various donors in memory of the late E.W.H. Brown. Annual interest from the fund is awarded to a deserving student at the discretion of the Financial Awards Committee.

Sam Brown Scholarship & Bursary Fund established in memory of the late Mr. Sam Brown. The original donation of $7,500 has risen to $15,000 and will be used for a scholarship and bursary program for deserving students.

Burnaby Centennial Lions Club contributed a $400 bursary in honour of the late Mr. Robert Rourke for a deserving student in the Forest Resource Technology; Fish, Wildlife and Recreation option.

The **Dr. W.K. Burwell** Memorial Bursary has been established in 1981 through an estate donation of $25,000. Bursaries are to be awarded from the annual interest to students studying in the Health Technologies, specifically Radiological Technical Services.

Caesar Canning Limited contributed $250 to be awarded as a scholarship to a student at the Institute in the Marketing Management Technology.

Charles Calder Memorial Scholarship in the amount of $5,000 was donated to BCIT by the beneficiaries of the estate of Charles Cummings Calder in 1978. Annual interest from the trust fund is to be awarded to a deserving student in the Mechanical Technology.

Canada Cement LaFarge Limited contributed $500 to the scholarship fund for deserving students at the Institute, to be awarded at the discretion of the Financial Awards Committee.

Canada Packers Limited contributed $250 for a scholarship to be awarded to a student in the Agricultural Management Program of the Biological Sciences Technology.

Canada Safeway Limited contributed $300 for bursaries to be awarded to deserving students in the Marketing Management Technology.

Canadian Forest Products Ltd. contributed a $300 bursary to be awarded to a deserving student from the Mount Waddington Regional District. The donation is to be known as the Owen B. Hennigar Bursary.

Canadian Forest Products also contributed $2,000 for entrance scholarships for deserving students.

The Canadian Forestry Association of British Columbia contributed a $200 bursary to be awarded to a student in the Forestry Option or the Fish, Wildlife and Recreation Option of the Forest Resource Technology who has been a member of the Junior Forest Wardens or Girl Forest Guard Movement.

The Canadian Institute of Public Health Inspectors, contributed $3,000 in 1974, the annual interest of which is to be awarded as a bursary to a second year student in the Environmental Health Technology. This bursary is to be referred to as the D.D. McNab Bursary.

The Canadian Institute of Public Health Inspectors, B.C. Branch, contributed $3,000 in 1974, the annual interest of which is to be awarded as a bursary to a first year student in the Environmental Health Technology. This bursary is to be referred to as the Canadian Institute of Public Health Inspectors, B.C. Branch Bursary.

The Canadian Institute of Public Health Inspectors, contributed $3,000 in 1974, the annual interest of which is to be awarded as a bursary to a second year student in the Environmental Health Technology. This bursary is to be referred to as the J.A. Stringer Bursary.

Canadian Kenworth Limited contributed $100 for a deserving student at the Institute, to be awarded at the discretion of the Financial Awards Committee.

Canadian Occidental Petroleum Limited contributed $200 for a deserving student at the Institute, to be awarded at the discretion of the Financial Awards Committee.

Canadian Pulp & Paper Association contributed $750 scholarship and bursary fund for deserving students in the Chemical Sciences Technology, Pulp and Paper option.

The Canadian Stevedoring Company Limited contributed $300 for a deserving student at the Institute to be awarded at the discretion of the Financial Awards Committee.

Canadian Telephones and Supplies Limited contributed $200 for a deserving student at the Institute, to be awarded at the discretion of the Financial Awards Committee.

Canadian Tire Stores Scholarship Program contributed up to $2,500 to be used as tuition scholarships in the amount of $500 for deserving students in Marketing Management Technology.

Chapter A.S. of the P.E.O. Sisterhood contributed a $300 bursary for a deserving student in the Nursing Technology.

Chevron Canada Limited contributed $2,000 for four $500 bursaries to be awarded to deserving students in the Business Management Division.

Cominco Limited contributed $700 for two $350 scholarships; one to be awarded to a student in the Chemical Sciences Technology, and one to be awarded to a student in the Mining Technology.

Commonwealth Construction Limited contributed a $300 bursary for a deserving student at the Institute, to be awarded at the discretion of the Financial Awards Committee.

Cosmopolitan Importers Limited contributed a $250 scholarship to a deserving student at the Institute, to be awarded to a student in Operations Management, Transportation and Distribution Management Option.

Craigmont Mines Limited contributed $1,000 for two $500 scholarships to be awarded to students in any of the following technologies: Chemical Sciences, Mining and Surveying.

The Credit Union Foundation of British Columbia contributed a $400 bursary fund for deserving students at the Institute, to be awarded at the discretion of the Financial Awards Committee.

Data Processing Management Association contributed a $200 scholarship to be awarded to a deserving student in the Computer Systems Technology.

Delta Hotels Limited contributed a $300 scholarship to be awarded to a student in the Hospitality and Tourism Administration Technology.

The Dillingham Corporation Canada Limited contributed two $500 bursaries to be awarded to students in Civil and Structural Technology and Survey Technologies.

Domtar Construction Material Limited contributed $425 for a deserving student at the Institute, to be awarded at the discretion of the Financial Awards Committee.

E For M/Honeywell (formerly Electronics for Medicine Canada Limited) contributed a $100 scholarship for a deserving student in the Biomedical Electronics Technology.

The East Asiatic Company (Canada) Limited contributed $100 for a deserving student at the Institute, to be awarded at the discretion of the Financial Awards Committee.

A scholarship of $500, the gift of the **Eaton Foundation**, will be available to a student in the Marketing Option of the Marketing Management Technology.

Empire Stevedoring Company Limited contributed a $100 bursary for a deserving student in the Technology—Transportation and Distribution Management Option.

Endako Mines, Division of Canex Paper Limited, contributed $1,000 for two $500 scholarships to be awarded to students in any of the following technologies: Chemical Sciences, Mining or Surveying.

Evans Products Company Limited contributed $400 for an entrance scholarship for a deserving student at the Institute in the Forest Products Technology, Lumber and Plywood Program.

Evergreen Press Limited contributed $500 to be awarded at the discretion of the Financial Awards Committee.

Field's Stores Limited contributed $150 for a bursary to be known as the Field's Stores Lou Rogers Memorial Bursary, to be awarded to a student in the Marketing Management Technology.

The Fraser Valley Milk Producers Association contributed $150 for a bursary to be awarded to a deserving student in the Biological Sciences Technology, Food Production or Food Processing Options.

Garland Commercial Ranges Limited contributed a $200 scholarship for a deserving student in the Hotel, Motel and Food Services Option of the Hospitality and Tourism Technology.

Gibraltar Mines Limited contributed $1,000 for two $500 scholarships to be awarded to students in any of the following technologies: Chemical Sciences, Mining or Surveying.

Giroday Sawmills Limited contributed a $200 bursary for a deserving student at the Institute, to be awarded at the discretion of the Financial Awards Committee.

Dean H. Goard contributed $125 for a deserving student at the Institute, to be awarded at the discretion of the Financial Awards Committee. Mr. Goard was the former principal of the B.C. Institute of Technology.

Gray Beverage Company Limited contributed a $300 bursary fund to be awarded to deserving students in the Marketing Management Technology.

Gulf Canada Limited contributed a $300 bursary for a deserving student at the Institute, to be awarded at the discretion of the Financial Awards Committee.

"André Gutfreund Memorial Fund" — students and faculty of BCIT established a memorial scholarship and bursary fund in the memory of André Gutfreund, a second year Administrative Management Technology student who passed away in November 1978. One bursary and one scholarship will be awarded each year from the annual interest earned on the principal amount of $2,300 to deserving students in the Administrative Management Technology.

The M.C.D. Hobbs Bursary Fund was established by Mr. M.C.D. Hobbs, a former member of the Board of Governors at BCIT. The interest from his donation of $7,500 in the years 1976-1980, is to be awarded to a deserving student of the Institute at the discretion of the Financial Awards Committee.

I.C.L. Engineering Limited contributed $300 for a bursary to be awarded to a deserving student or students in the Mechanical Technology.

Imperial Oil Limited contributed $1,000 to deserving students at the Institute, to be awarded at the discretion of the Financial Awards Committee.

Imperial Order Daughters of the Empire —Colonel Burnaby Chapter contributed a $500 bursary for a deserving student in the Health Division residing in Burnaby. The bursary is known as the Beatrice Pontifex Bursary.

Inflight Food Services Association contributed $3,000 for deserving students at the Institute to be awarded at the discretion of the Financial Awards Committee. A portion of the amount will be awarded as a graduating award to a student in the Hotel, Motel & Food Services Option of the Hospitality & Tourism Technology.

Inland Natural Gas Company Limited contributed a $350 bursary to be awarded to a student in the Natural Gas and Petroleum Technology residing in the area serviced by Inland Natural Gas Company Limited, including East and West Kootenay areas.

Institute of Chartered Secretaries and Administrators contributed $200 for two scholarships for students in the Administrative Management Technology; one Administration Option and one Public Administration.

The Laurie Jack Memorial Fund was established by various donors in memory of Laurie Jack, former president of the BCIT Student Council, the annual interest of which is to be awarded as three prizes to students who worked on behalf of their fellow students during their first year. The Laurie Jack prizes are co-sponsored by the BCIT Student Association.

Johnston Terminals Limited contributed a $250 scholarship for a deserving first year student in the Transportation and Distribution Option of the Operations Management Technology.

Keen Engineering Company Limited contributed a $300 bursary for a deserving student at the Institute, to be awarded at the discretion of the Financial Awards Committee.

Kelly Douglas & Company Limited contributed a $200 scholarship to be awarded to a student in the Administrative Management Technology.

Peter Kiewit Sons Co. Limited contributed $350 to a deserving student at the Institute, to be awarded at the discretion of the Financial Awards Committee.

The Kiwanis Club of Vancouver has established a memorial fund in 1976 in the amount of $10,000 to the late Honorable H. Stevens to provide bursaries to part-time students. Interested businesses, individuals and organizations are encouraged to contribute to this worthwhile fund.

Kodak Canada Limited contributed $225 for a deserving student at the Institute, to be awarded at the discretion of the Financial Awards Committee.

Koffler Stores (Western) Limited contributed $300 to the "Shoppers Drug Mart Scholarship Prize" to be awarded to a deserving student in Marketing Management, whose interests are in the retail industry and who demonstrates an outstanding interest in the field of marketing.

Kraft Limited contributed a $100 bursary to be awarded to a deserving student at the Institute, at the discretion of the Financial Awards Committee.

Labatt Breweries of British Columbia Limited contributed one $300 and one $200 bursary for needy students at the Institute in Marketing Management.

The Lapidary Rock & Mineral Society of British Columbia contributed $570 for a bursary to be awarded to students in the Mining Technology.

McKim Advertising Limited contributed a $100 bursary to a deserving student to be awarded at the discretion of the Financial Awards Committee.

Claire and Murray MacKenzie donated $3,000 in 1981 to be called the Claire and Murray MacKenzie Foundation, the annual interest of which is to be awarded at the discretion of the Financial Awards Committee.

MacMillan Bloedel Limited contributed two entrance scholarships of $200 each to students entering the first year of the Lumber and Plywood Technology.

The Derek S. Mann Memorial Fund was established in 1974 by various donors, in the amount of $1,685, the annual interest of which is to be awarded to deserving students in the Building Technology.

Marathon Realty Company Limited contributed a $860 bursary to be awarded to a deserving student at the Institute at the discretion of the Financial Awards Committee.

Medtronic of Canada Ltd. contributed a $250 bursary to be awarded to a deserving student in the Biomedical Electronics Technology.

Memspec Computer Systems Incorporated established a trust fund in 1980 in the amount of $2,200, annual interest to be awarded to a needy student in digital electronics, computers or microcomputers.

Mercantile Bank of Canada contributed a $860 bursary to a deserving student at the Institute, in the Administrative Management Technology.

Mill & Timber Products Limited, established the Sam Hughes Memorial Bursary Fund in 1972 in the amount of $2,085 to honor the memory of the late Mr. Sam Hughes, principal of the company, the fund is to contribute $200 for two $100 bursaries; one to be awarded to a deserving student in each of Administrative Management and Forest Resource Technologies. The fund was supported by an initial contribution of $2,049, representing the total proceeds of donations to the Sam Hughes Memorial Fund.

Mohawk Oil Company Limited contributed $500 to be distributed as follows: one $150 bursary to a deserving student in the Marketing Management Technology; one $150 bursary to a deserving student in the Operations Management Technology; and $200 to be awarded to deserving students in the Natural Gas and Petroleum Technology.

Molson Companies Donation Fund (Beaver Lumber Corporation) contributed $1,500 to be distributed as follows: one $700 entrance scholarship to a first year Marketing Management student, Marketing Option; one first year prize of $400 to a Marketing Management student, Marketing Option; and one $400 bursary to a Marketing Management student, Marketing Option.

Neptune Bulk Terminals Limited contributed a $860 bursary for a needy student to be awarded at the discretion of the Financial Awards Committee.

W.E. Noel Scholarship & Bursary Fund established in 1982 to honour W.E. Noel, now retired.

North Shore Fish and Game Club contributed $300 to be known as the "North Shore Fish and Game's Club Bursary" to be awarded to a second year student in the Fish, Wildlife and Recreation Option of the Forest Resource Technology.

Northwood Pulp and Timber Limited awarded an entrance scholarship of $900 to a student entering the first year of the Lumber and Plywood Technology.

Northern Construction Company has established a trust fund in 1981 in the amount of $9,500, the interest of which will be awarded as a scholarship to a deserving student in the Administrative Management, Financial Management, or Civil and Structural Technologies.

The Nuclear Medicine Advisory Committee contributed a $575 scholarship to be awarded to deserving students in the first year of the Nuclear Medicine Technology.

Pacific Coast Fisherman's Mutual Marine Insurance Company contributed a $600 bursary to a student whose family has a fish boat.

Pacific Forest Products (formerly Pacific Logging Company Limited) contributed $1,500 for a deserving student at the Institute, to be awarded at the discretion of the Financial Awards Committee.

Pacific Western Airlines contributed $500 for deserving students at the Institute, to be awarded at the discretion of the Financial Awards Committee.

Armand Paris Memorial Fund established in 1982 in memory of the late Armand Paris of the BCIT Mathematics Department. This bursary is to be awarded annually to a deserving Mathematics student entering second year at the discretion of the Math department.

E.B. Peerless Limited contributed $300 for a deserving student at the Institute, to be awarded at the discretion of the Financial Awards Committee.

J.A. Pentland Limited contributed a $4,000 endowment fund in 1980. The annual interest is to be awarded to needy students in the Prosthetics and Orthotics Technology.

Philips Electronics Limited contributed $400 for a deserving student of the Medical Radiography Technology at the discretion of the Financial Awards Committee.

Placer Development Limited contributed $1,000 for scholarships to be awarded to students in the Mining Technology.

Quantity Surveyors Society of British Columbia contributed a $200 scholarship for a deserving student at the Institute in the Economics Option of the Building Technology.

The Rotary Club of Vancouver contributed a $1,000 bursary fund for deserving students at the Institute, to be awarded at the discretion of the Financial Awards Committee.

Royal Canadian Legion, Pacific Command contributed $300 bursary.

Royal Canadian Legion, Ladies Auxiliary contributed $500 bursary.

Royal City Foods Limited contributed $400 for a scholarship to be awarded to a student in the Food Processing or Food Production Option of the Biological Sciences Technology.

Russell Food Equipment Limited contributed $300 for a scholarship to be awarded to a student in the Hospitality and Tourism Administration Technology.

Gordon Russell Limited contributed $50 for a deserving student at the Institute, to be awarded at the discretion of the Financial Awards Committee.

Sapperton Fish and Game Club contributed $100 for deserving students at the Institute, to be awarded at the discretion of the Financial Awards Committee, and $100 to be given to a student who is a member of the B.C. Wildlife Federation or similar club.

Sauder Industries Limited contributed $500 to be awarded to students at the discretion of the Financial Awards Committee.

Scott Paper Limited contributed a $500 scholarship for a deserving student in the Marketing Management Technology, Marketing Option; Financial Management Technology, Accounting Option; or in Computer Systems Technology.

Seaspan International Ltd. contributed a $500 bursary for a deserving student in the Operations Management Technology, Transportation and Distribution option.

Sertoma Club, B.C., contributed a $200 bursary to a needy student, at the discretion of the Financial Awards Committee.

H.A. Simons (International) Limited contributed $1,720 to be awarded as bursaries to students in the Civil and Structural Technology, the Electrical Technology, the Instrumentation Option of the Electrical Technology, the Mechanical Technology and the Forest Products Technology.

Smith Paper Limited contributed $500 to the bursary fund for deserving students at the Institute, to be awarded at the discretion of the Financial Awards Committee.

South Burnaby Garden Club contributed a $125 bursary to be awarded to a needy student in the Biological Sciences Technology.

Steel Brothers Canada Limited contributed a $300 bursary to a needy student at the Institute to be awarded at the discretion of the Financial Awards Committee.

Sun-Rype Products Limited contributed $250 for a scholarship to be awarded to a deserving student in the Biological Sciences Technology.

Sunshine Coast Bursary and Scholarship Fund contributed $200 to be awarded to deserving students at the Institute at the discretion of the Financial Awards Committee.

Tahsis Company Limited contributed $1,000 for two $500 scholarships; one to be awarded to a student in the Forest Products Technology, and one to be awarded to a student in the Forestry Program of the Forest Resource Technology.

This 'n' That Campus Shop contributed a $600 scholarship for a deserving student entering second year in any one of the Engineering Division technologies. This scholarship is in memory of the late Mr. W.V. Rudd, a former instructor of the Civil and Structural Technology.

Thompson, Berwick, Pratt & Partners contributed a $500 scholarship to be awarded to a student in the Building Technology.

3M Canada Inc. contributed $1,000 for two $500 bursaries to be awarded to needy students in the Business Management and Engineering Divisions.

Town and Country Inns contributed a $300 scholarship to a deserving first year student in the Hotel Option of Hospitality and Tourism Technology.

Trans Mountain Pipe Line Company Limited contributed $1,000 for four $250 bursaries for deserving students at the Institute, to be awarded at the discretion of the Financial Awards Committee.

Truck Loggers Association contributed a $250 bursary and a $250 scholarship to be awarded at the discretion of the Financial Awards Committee.

Tuberculous and Chest Disabled Veterans' Association contributed a $350 scholarship.

University Publishers contributed $100 to be awarded to a financially deserving student in the Engineering Division at the discretion of the Financial Awards Department.

University Women's Club of Vancouver contributed a $350 bursary for a female student to be awarded at the discretion of the Financial Awards Committee.

Utah Mines has established a fund in the amount of $4,250 U.S. whereby the principle amount is to be awarded to native men or women graduates of the North Island Senior Secondary or Port Hardy Secondary Schools, and $700 of the accumulated interest is to be awarded as an entrance scholarship to a deserving student of the Institute who is also a graduate of the Port Hardy Secondary School.

Vancouver Cablevision Limited contributed $350 each for a deserving student in the Television Option and the Journalism Option of the Broadcast Communications Technology.

Vancouver City Savings Credit Union contributed $900 for two $450 bursaries to deserving students at the Institute, to be awarded at the discretion of the Financial Awards Committee.

Vancouver Foundation contributed a $2,500 bursary fund for deserving students at the Institute, to be awarded at the discretion of the Financial Awards Committee.

Vancouver Horticultural Society established a $10,000 endowment fund in 1978. Annual interest is to be awarded to needy and deserving students in the Biological Sciences Technology.

Vancouver Municipal and Regional Employees' Union made a bursary of $200 available to members of the union, or to the sons, daughters or legal dependents of members of the union. The award, based on financial need and academic standing in previous studies, will be made by BCIT in consultation with the union, to a qualified applicant who is beginning or continuing full-time enrolment at BCIT.

The Vancouver Women's Transportation Club contributed $500 for deserving students in second year in the Transportation and Distribution Option of the Operations Management Technology.

Van Waters & Rogers Limited contributed a $500 bursary for a deserving student at the Institute, to be awarded at the discretion of the Financial Awards Committee.

L.A. Varah Limited contributed $125 for a bursary to a deserving student in the Electrical Technology.

Versatile Cornat Corporation contributed $700 for a deserving student at the Institute, to be awarded at the discretion of the Financial Awards Committee.

Mr. and Mrs. Gordon Wagner established a $5,000 endowment fund in 1979 to be known as the **"Keith Wagner Memorial Bursary"**, in memory of their son Keith. The minimum amount of $500 is to provide a bursary for needy students in the Survey Technology. First priority is given to students from the Comox Valley, followed by Vancouver Island, and thirdly residents of B.C.

Wajax Limited contributed a $250 bursary to be awarded to a deserving student at the Institute at the discretion of the Financial Awards Committee.

Weldwood of Canada contributed $1,000 to be awarded to deserving students at the Institute in the Forest Resource Technology.

Westcoast Transmission Co. Ltd., contributed a $500 bursary for a deserving student at the Institute in the Natural Gas and Petroleum Technology.

Western Canada Steel Limited contributed $400 for a deserving student in a steel manufacturing related technology.

Westin Corps (formerly Hard Corps Western International Scholarships Foundation) contributed $1,000 for scholarships to be awarded to deserving students in the Hospitality and Tourism Administration Technology.

Westinghouse Canada Inc. contributed $200 for a deserving second year student in the Electrical Technology, Power Option; or, Administrative Management Technology, Administration option.

Weyerhaeuser Canada Limited contributed $1,400 for 2 entrance scholarships to be awarded to deserving students in the Chemical Sciences Technology, Pulp and Paper Option.

Wilkinson Company Limited contributed $250 for deserving students at the Institute, to be awarded at the discretion of the Financial Awards Committee.

"George Raven Wood Bursary" — The late Mr. G. Wood, former owner of Carson Truck Lines named BCIT as a beneficiary in his will, establishing a trust fund in the amount of $200,000 in 1979. Annual interest income from the fund is to provide tuition fees and other related expenses for needy students who would not otherwise be able to attend BCIT.

Woodwards Stores contributed two $200 bursaries for deserving students at the Institute in the Biological Sciences and Marketing Management technologies.

Xerox of Canada Limited contributed a $500 scholarship for a deserving student in the Business Management Division or the Electrical Technology. This award is known as the Xerox of Canada Fellowship Award.

Yorkshire Trust Company contributed a $600 bursary for needy students to be awarded at the discretion of the Financial Awards Committee.

Conduct and Attendance

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

1. Students are expected to conduct themselves in an exemplary fashion at all times and pay diligent attention to their studies. If the Division Dean or Registrar believes a student's conduct is such that it is detrimental to the interests of the Institute, a recommendation may be made to the President to exclude the student from further attendance. The President has the final power to suspend or expel a student for disciplinary reasons, subject to the student's right to appeal this decision to a committee designated by the Board of Governors. A student who has been expelled or suspended for misconduct will not be admitted to the Institute grounds or buildings.

2. The Institute is not responsible for debts incurred by student organizations.

3. If through his or her carelessness or negligence, a student damages the property of the Institute, he or she shall 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.

4. A student will not be permitted to borrow or remove any apparatus or tools except by written authority of the President or his delegate.

5. General supervision over all forms of entertainment given under the auspices of a student organization comes under the jurisdiction of the President.

6. 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:

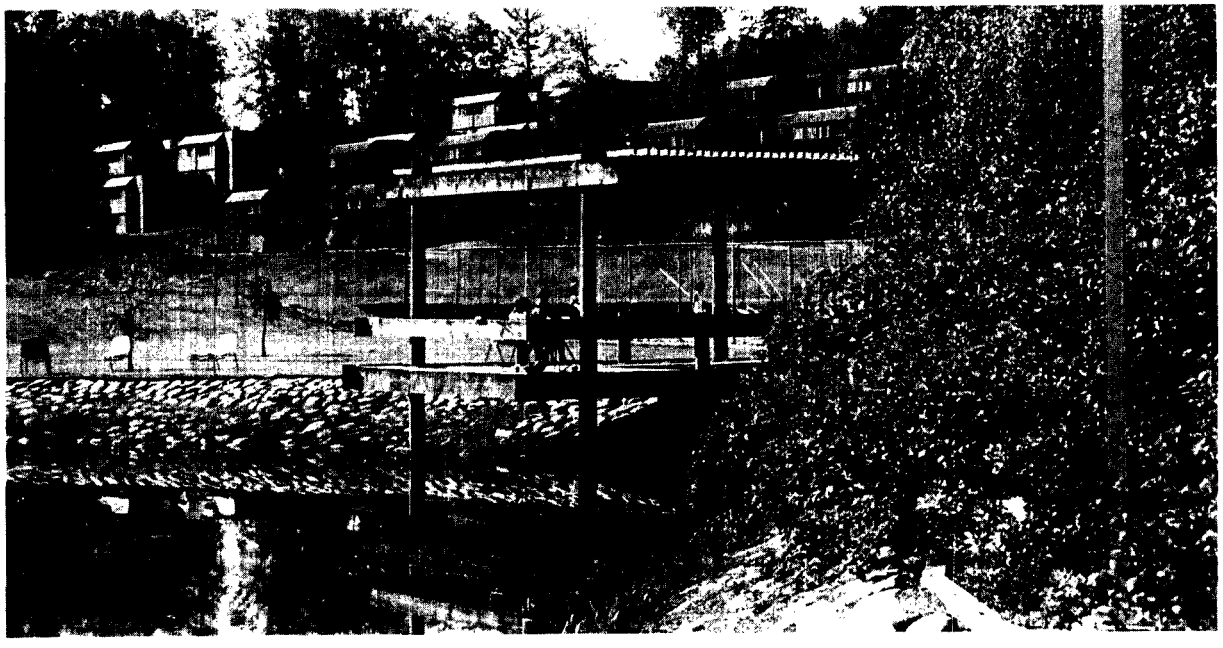
(a) In some field trip and laboratory situations, safety considerations require that special head gear, shoes, or other clothing and other safety equipment must be worn.

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

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

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

Housing



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

You may wish to apply for accommodation in the Maquinna Residence, which opened in September 1978, or you may prefer private housing.

Maquinna Residence

Located on campus, less than one minute's walk from classes, the Maquinna Residence consists of five low-rise split-level houses with a total of 336 beds and common cooking and living facilities. Parking and administrative services are also provided.

Six single study-bedrooms, carpeted and comfortably furnished with bed, desk, and bureau are located on each floor and share individualized washroom facilities. Two floors share a kitchen, dining area and living room. The common kitchen area includes two refrigerators, two stoves, two sinks and adequate cupboard space. Each house has separate laundry and storage facilities.

Each house accommodates 48 people and has a Residence Adviser's apartment. Houses will accommodate students on an all-male, all-female or co-educational basis. BCIT does not currently have accommodation for married students, and/or students with dependents.

How to apply for residence accommodation

Before the inception of the academic year, students from outside the Vancouver Lower Mainland are given first priority for residence accommodation. First year students receive a residence application following notification of acceptance from the Admissions Department. The Residence application form should be completed and returned to the Housing Office immediately. Applicants will be informed of their status by early July.

Off-campus housing

Since residence accommodation is limited, most BCIT students live in off-campus housing. The Housing Office compiles a list of accommodation offered by residents in surrounding communities, and has established a regular resource of off-campus housing for BCIT students. Maps, general information, listings and a telephone service are available for use in the Housing Office during the week with some weekend service during late summer. To check weekend hours please contact the Housing Office by mail or telephone.

Housing Staff:

Val Karpinsky, Director Ancillary Services
Helen Moore, Secretary.

Recreation Services

Facilities
BCIT offers a variety of indoor and outdoor recreational factilities designed to appeal to most students. All students, staff and alumni are encouraged to use the sport facilities. Included are four racquetball/handball courts, two squash courts, an excellent gymnasium which accommodates eight badminton, two basketball, three volleyball courts, and is used for many other sports and recreational activities. The activity room is equipped with a universal gym, weights, exercise area, table tennis, ballet barre and much more. The excellent outdoor recreation facilities include four tennis courts, two sports fields, a fitness trail, and exercise stations, as well as a 396 metre (440 yard) track. Complete shower facilities, change and locker rooms for both men and women, and towel and laundry services are available.

Hours of operation
September - May:

Monday - Thursday	0630 - 2300
Friday	0630 - 2200
Saturday and Sunday	0800 - 2200

June - August: To be announced. Facility hours are subject to change, check the weekly schedule posted, 2-3 weeks in advance, outside the Recreation Equipment office. The schedule will indicate when open and programmed time is available in the gym for your own activity. There are many structured programs to participate in and plenty of schedule time available.

Equipment
Most equipment is provided on loan; current BCIT identification is mandatory.

Pro Shop Services: The Equipment Office features a new Pro Shop which carries all essential sporting goods and some special products. The equipment staff also provides a racquet re-stringing service with excellent prices.

Booking
Gym: Technologies or BCIT groups can book half the gym at three or four specified times per week as noted on the weekly facility schedule. This program is known as **Technology Challenge Booking** and is set-up to allow groups to get together to enjoy a recreation activity.

Badminton, Tennis, Table Tennis: Booking is on a first-come, first-served basis with no charge for court time. Patrons must check in and book the court at the Equipment Office. There is no pre-booking allowed and court time limit is 45 minutes.

Squash and Racquetball: At any given time patrons may book in advance for court time during the subsequent three full days, Monday through Sunday. Re-booking is not acceptable until existing booking has expired. Initial and last names are required for bookings and while students, staff, and general public must book in person by presenting a current BCIT library card or BCIT photo I.D. card, alumni members may book in person or by telephone using their recreation facility card number. Alumni may pick up their recreation facility card by showing a current alumni card at the Recreation Equipment office. No person may reserve for another person or group.

Recreation Services reserves the right to book court times for private lessons.

Fees
All fees must be paid when a court is booked and there are no refunds under any circumstances after court is booked.

Racquet sports have a nominal fee for balls and birds.

Regulations
The Recreation Services staff are responsible for the facility. Smoking is not allowed in the recreation facility except in corridors, washrooms and offices. Alcoholic beverages, including beer and wine, will be allowed in the recreation facility only with the approval of the Institute's chief executive officer and the appropriate permits. Proper attire and accessories, shorts and shirts or sweat suits, clean non-marking gym shoes (white soles preferred), and safety eye protection, available FREE at the equipment office, must be worn in squash and racquetball courts. Failure to wear eye protection will result in loss of court use. Only non-marking balls are to be used in courts.

Babysitting services are not provided and our concern about safety requires that children not accompany adults if they are to be left unattended during court play.

All players are required to check in at the Equipment Office prior to their use of the court. A 10 minute grace period is provided for all players to claim their court. If left unclaimed, it may be used by someone else. 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.

One person may book a court for practice or hold a court if a partner does not show. Recreation Services reserves the right to book court times for private lessons.

Campus Recreation
Campus Recreation is here to assist you in planning your leisure time. Fitness activities and leagues are scheduled around academic programs. Inquiries re special interest areas not covered in this section are invited by dropping in or calling the Campus Recreation office located in the lobby of the SAC buiding, telephone 434-5734, local 782.

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

Clubs Activities such as trips and tournaments for weekends and midterm breaks are organized by groups with some funding available to assist in transportation and equipment rentals. Activities pursued by existing clubs include skiing, outdoor recreation, scuba, sky-diving, archery, and windsurfing.

Non-credit courses Beginner's courses in Kung-fu, squash, racquetball, jazz dance, golf, fitness to music, etc. are ongoing during the school year and are subsidized by the student activity fee.

One-day workshops: Weekend one-day courses, subsidized by the student activity fee, include self-defence for women, massage, stress management, and various sports.

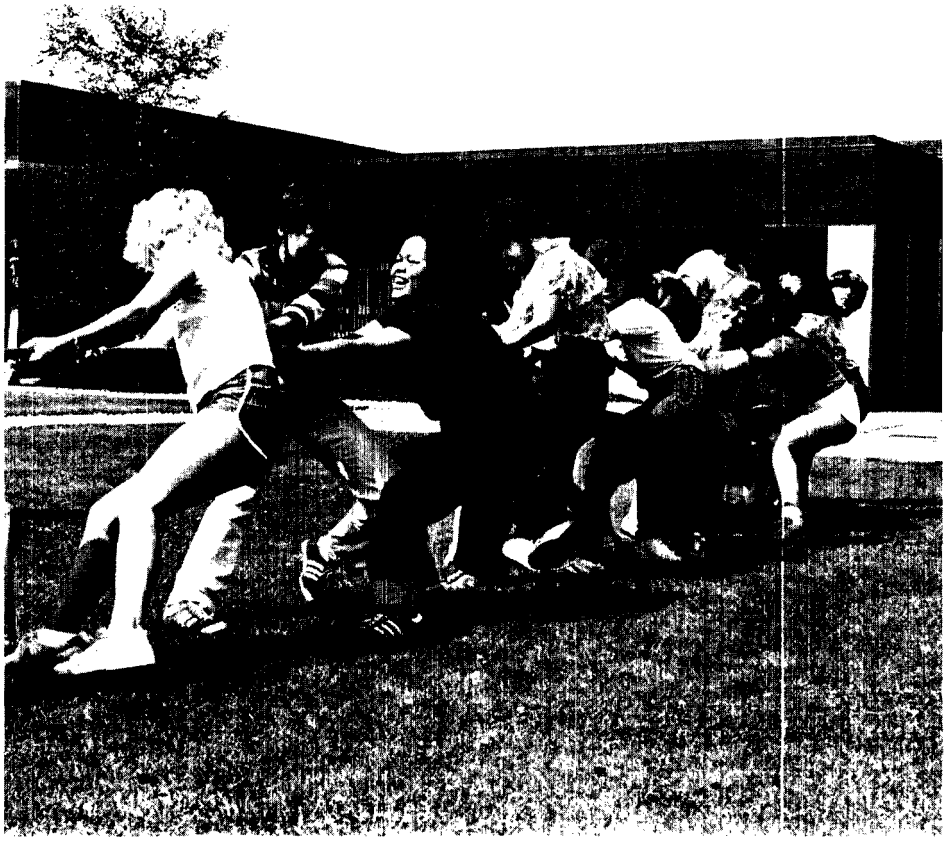
Personal fitness incentives To encourage individuals to do their own thing, we have T-shirt awards for jogging, swimming, and walking. Register when you start, tell us when you have finished and pick up your free T-shirt. Swimmers and skaters can obtain tickets at the Campus Recreation Office for Burnaby Recreation facilities with the student activity fee paying half the cost.

Special events Throughout the year we schedule recreational invitational activities which combine low skill requirements, and competitive tournaments. These are mainly events with students from other institutes (UBC, SFU, Douglas College, etc.) and the student activity fees entitle you to participate in any program. If you have any other interest that may attract students/staff please drop in or call the Campus Recreation Coordinator in the Student Activity Centre (S.A.C.), 434-5734, local 782.

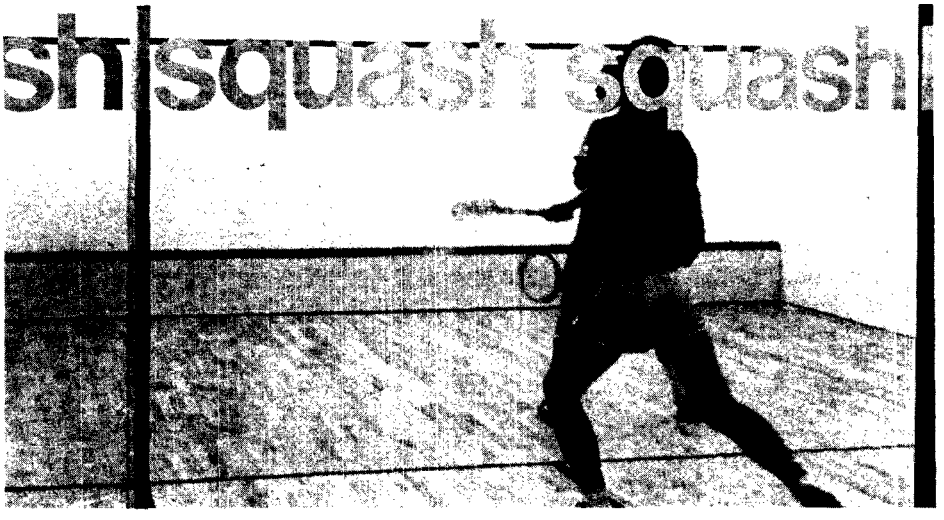
Athletic Therapy

To help ease the pain of sports injuries, BCIT employs a full-time athletic therapist. Therapy ranges from ice-packs and heat to ultra-sound and whirlpool treatments. The athletic therapist will also counsel you on problems related to your personal fitness program. The therapist is on duty Monday to Friday, 0830 to 1630. A staff of part-time student trainers is available for evening and weekend intramurals and recreational events. Students and staff members requiring treatment are usually referred through Medical Services, although persons wishing to make appointments directly may call the therapist at 434-5734, local 611. The Athletic Therapy office is located in the east wing of the Student Activity Centre beside Medical Services.

Campus recreation co-ordinator ..... Local 782
Facilities co-ordinator 613
Athletic therapist 611
Equipment Office and attendants 612/395
Weekend/nightline 434-5735



Student Association



The Student Association is the independent "student union" at BCIT. It provides most of the non-academic services and nearly all of the recreation and entertainment on the campus. As well, the SA ("ess-ay") runs three campus stores, a cafeteria, a pub and a print shop to serve students while they are studying at BCIT.

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

Another portion of the fee goes to pay for the Student Association's new Campus Centre, a multi-million dollar recreational complex organized and financed entirely by the Student Association. The Campus Centre is the first independently-financed student building constructed in western Canada in twenty years. Phase One, containing squash and racquetball courts, is now complete. Fundraising is underway for two more phases. Phase Two will provide new offices and meeting areas for the SA; Phase Three will consolidate the SA's cafeteria and pub operations into a new facility with an outdoor beer garden and skylighted lounges.

The Student Association holds elections each April to choose a nine-member Executive-President, Vice-President Administration, Vice-President Public Relations, Treasurer, Activities and Sports representatives, and one representative each from the Business, Health and Engineering divisions. The Executive is responsible for the day-to-day management of the Association's affairs and the spending of its budget. The Executive meets regularly with the Student Council, consisting of about 20 students selected by and from technologies. In addition, the Executive appoints a delegate to the Board of Governors.

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

Most of the management of the SA's business operations is entrusted to a full-time professional staff of about 18, which is hired by the Executive and reports to Business Manager Phil Henderson. Linda Field is the TNT Stores Manager, Debbie McMillan is Growlies Good supervisor, Peter Grant is pub manager, Don Wright is manager of the Publications office, Janice Eden is the Student Association's secretary and Stephen Tran is Marketing Director.

Activities

The SA funds, in part, the Intramurals athletics and clubs program, which provides lunch hour and after-class recreation for several hundred BCIT students. Clubs, such as ballroom dancing, skydiving and scuba, attract an active following.

The Student Association regularly sponsors free films and concerts on the campus to provide a respite from the weekly workload. The pub is open weekday evenings and an occasional dance is held in the SAC building on Saturday night. Larger dances are usually held off-campus. For skiers, the SA owns a 24-bed chalet at Whistler Mountain, which is available year-round to students at a reasonable nightly rental.

The Link is BCIT's student newspaper, and operates independently from the SA's Publications Department. This department also provides printing and binding jobs to individuals and maintains the SA-owned copy machines in the SAC hallway. Publications annually produces a Student Handbook.

For the past dozen years, the SA has been a major supporter of the Shinerama Cystic Fibrosis fundraising campaign held each September, during which students shine shoes for donations around the Lower Mainland. Students also are organized to help with the Variety Club Telethon each February. Over a quarter of a million dollars have been donated to charities in Vancouver by BCIT students.

Video game addictees find a well-equipped games room in the SAC Building. Student travellers can obtain discount charter flights through the SA's Association of Student Councils affiliation.

The This & That Emporium has the reputation as the best place to buy electronic calculators; Growlies, in the SAC building, has the best do-it-yourself sandwich bar on campus. Not content to rest on its laurels, the SA is constantly experimenting with new services and facilities for the BCIT campus. It deserves its reputation as "the best organized student union in western Canada."

Placement

The **Canada Student Employment Centre**, a placement and career counselling centre staffed by federal government personnel, is located in room 204 of the 2N building. Hours are 8 a.m. to 4:30 p.m. Monday through Friday throughout the year.

The Centre assists graduate and undergraduate students seeking employment by arranging on-campus seminars and interviews with employers for both career and summer jobs. Both full-time and part-time job opportunities are posted on the job information boards located inside the office.

To assist students in developing a career plan and preparing for interviews, a library of current information on companies is maintained. In addition, a counsellor is always available to discuss employment problems, resumés and job-search techniques.

Staff

Bev English, Dipl.T., Acting Branch Manager
Alison Meunier, B.A.Sc., Counsellor
Joanie Parker, Receptionist
Patricia Stephens, Employment Counsellor Assistant

Medical Services

A five-bed **Medical Services** unit, located in the Student Activity Centre, is staffed by physicians and nurses Monday through Friday, 8:30 a.m. to 4:30 p.m. A doctor is on call at all times and Burnaby General Hospital is ten minutes from campus. A psychiatrist is also available.

An interview with a doctor is chargeable to the student's medical plan and students must either be covered under their parents' plan or make their own arrangements for coverage before registration. Some medication is dispensed free of charge and most immunizations are free. There is no dentist on staff, but Medical Services can usually assist with dental appointments.

No appointment is needed to visit Medical Services, except in the case of a complete physical examination. All visits are confidential.

Staff

Barbara E. Copping, B.Sc., M.Sc., M.D., Director-Physician
David Mullard, M.D., B.S., Physician
Jacqueline Hurst, B.Sc., M.D., Physician
Oliver Robinow, B.Sc., M.D., F.R.C.P.(C), Psychiatrist
Joyce Jamieson, R.N., Nurse
Shirley Tempest, R.N., Nurse
Millie Linnen, R.N., Nurse
Joan Barrett, Secretary
Carol Braden, Medical Office Assistant

Etcetera

The Institute and campus have several features which make student life more convenient.

Campus Food Service offers a variety of snacks and full meals at varying times throughout the year. A snack bar with short order grill service neighbors the main cafeteria. **"Growlies",** a student-operated cafeteria in the Student Activity Centre, offers a wide variety of salads and custom-made sandwiches. The **'76 Servery,** on the ground level of the 2N building offers hot foods, snacks and refreshments during the day and evenings, at varying times throughout the year. A take-out service, the **"Road Runner",** is located in room 237, second floor of the 1A building and offers light lunches, snacks and refreshments. Vending machines are located at several points around campus.

The Bookstore, located on the east side of the Library, sells all books and supplies necessary for each program. Lists of required course materials are included in the registration package sent to students. Total cost is approximately $250.

Parking is available for students in unreserved areas on a "first-come, first-served" basis. Student parking lots are located at the east and south side of the campus. Students should not park in staff reserved lots, in spaces reserved for visitors, service vehicles and handicapped persons, in fire lanes, beside fire hydrants, along yellow curbs or on yellowlines on roadways or anywhere else that impedes free traffic flow. BCIT does not accept liability for damage to, or theft from, vehicles parked on campus. Students are encouraged to ensure that vehicles are kept locked and that valuables are not left in them. Handicapped students may apply for special parking privileges by contacting the BCIT Security Department located in portable 2T (local 719). Bus service to BCIT includes a No. 30 Willingdon, No. 820 Canada Way, No. 32 Grandview, a cross-town King Edward Ave. and a Special No. 39 Delta which leaves once per day, Monday-Friday at 7:25 a.m. from the corner of Halifax and Willingdon. (Students should check current B.C. Hydro bus schedules for any changes).

Lost and Found enquiries should be referred to the BCIT Security Department, portable 2T.

The **Lockers** at BCIT are available to students on a first-come basis, except in technologies with special requirements such as Forest Resources, Surveying, and Building. Students should locate an unreserved locker near their technology and put their lock on it.

Lockers are situated throughout the Institute on each floor of most buildings. Lockers must be vacated at the end of each academic year or no later than May 31. After this date, locks will be removed and the contents sent to the Athletic Office in the gym.

The Institute will not accept repsonsibility for the loss or damage to a student's personal property.

Gym lockers may be rented during the school year for a nominal fee.

There are three **"This and That"** stores on campus; one in the north foyer of the 1A building, one on the ground level of the 2N building, and one in the Student Activity Centre. The shops sell stationery and school supplies as well as BCIT souvenir items and confectionery. "This and That" stores are operated by the BCIT Student Association. Profits go towards student activities.

Banking services are available through the Canadian Imperial Bank of Commerce branch on campus, located at the north end of the Administration Building.

Board of Governors

BCIT is governed by a fifteen member Board, appointed by the Lieutenant-Governor in Council.

Chairman:
E.H. Alan Emery, B.A., LL.B.
Partner
Jones, Emery, Carfra Barristers & Solicitors

Vice-Chairman:
Malcolm C.J. Wickson, B.Comm., LL.B.
President
Mal-Cam Properties

Members:
Norman Barth
President
Burnaby General Hospital

Henry Bow, Dipl.T.
Senior Vice-President (International)
Bank of British Columbia

Marilyn Chilvers, B.A.
Partner
Chilvers/Lam Public Relations Consultants

Barbara Copping, B.Sc., M.Sc., M.D.
Director, Medical Services
BCIT

Robert Owen Fawcett,
Assistant Secretary
Real Estate Council of B.C.

Edward V. Hird, P.Eng.
Vice-President, Corporate Affairs
AEL Microtel Limited

S. Randle Jones, B.Comm.
President
Windsor Building Supply

James L. McPherson, C.A.
Senior Vice-President and
Chief Financial Officer
Placer Development Limited

Audrey D. Schatz
President
B.C. Personnel

Robert S. Simons, Dipl. T.
Group Product Manager,
Switching Systems
B.C. Telephone Company

Edward Arnold Taylor, C.G.A.
Comptroller
Crestbrook Forest Industry Limited

Robert Wong
Administrative Management
Technology BCIT

Richard A. Yates, LL.B., M.B.A.
Administrative Management
Technology BCIT

Keith Yorston
Chairman
Q.M. Industries Limited

(one member to be appointed)

Secretary to the Board:
Patricia Maertz,
434-5734, local 676

Academic and Administrative Personnel

G.A. Thom, B.Comm., M.B.A., M.Ed.,
President
D.J. Svetic, B.A.Sc., P.Eng.,
Vice President, Education
D.M. Macpherson, C.A.
Vice President,
Administration & Bursar
B. Gillespie, B.Sc., M.Sc.,
Dean, Health Division
J. Kyle, B.A., M.B.A., Ph.D.,
Dean, Business Division
R. Sterne, B.Sc., P.Eng.,
Acting Dean, Engineering Division
H. Arthur, B.A. (Hons..), M.A.,
Acting Dean, Core Division
D.M. Brousson, B.A.Sc., P.Eng.,
Dean Continuing Education and
Industry Services; Dean, Development
J.E. Carver, C.D., B.A., B.L.S.,
Dean, Library Services
E. Stewart, B.A., M.B.A.,
Director, Personnel and Employee
Relations Services
C. Greenhill, Dipl.T., B.Sc., M.A., Ed.D.,
Director, Institute Planning
B. Copping, M.D., B.Sc., M.Sc.,
Director, Medical Services
A. McLean, B.A., B.S.W., M.S.W.,
Director, Counselling Services
G.N. Lloyd, B.Sc., P.T.T.,
Director, Marketing and Development
G.Kenyon
Acting Registrar
W. Kurz, B.Sc., M.B.A.
Director, Computer Resources Centre
N. Andrew C.G.A.,
Director,
Institute Budget and Analyses
G. Nakatsu, C.A.,
Acting Director,
Financial Accounting
V. Karpinsky, B.A. (Hons),
Director, Ancillary Services
W. Hepple,
Director,
Purchasing and
Central Stores
R.C.W. Smyth, C.Eng., P.Eng.,
Director, Physical Plant

Calendar of Events

NOTE: The following holidays are common to all technologies

Sept 3	**Labour Day**
Oct. 8	**Thanksgiving Day**
Nov. 12	**Remembrance Day (in lieu)**
Dec. 17-Jan 2	**Christmas Break**
Mar. 4-8	**Spring Break**
April 5	**Good Friday**
April 8	**Easter Monday**
May 20	**Victoria Day (may be changed by Order in Council)**

Business Management, Engineering and Health Division 1984/85 (proposed)

1984

July 6	Term 1 fees due for classes starting September 5
Aug. 6	Term 3 fees due excluding Hospitality & Tourism: Hotel, Motel and Food Service option
Aug. 10	Term 3 fees due for Hospitality & Tourism: Hotel, Motel and Food Service Option
Aug. 27-31	Medical Radiography Term 1 Orientation Week
Sept. 4.	Registration/Orientation Day Term 1 and 3
Sept. 5	Terms 1 and 3 Classes start
Sept. 10	Term 3 Registration and Class start Hospitality and Tourism: Hotel, Motel and Food Service option
Sept. 18	Last day to withdraw and receive a full refund minus $75 commitment fee (Term 1 and 3)
Nov. 9	Last day to withdraw in order to receive "W" on transcript. After this date the transcript will show "F" (failure) for all courses dropped.
Nov. 12	Remembrance Day (in lieu)
Dec. 10-14	Terms 1 and 3 examinations

1985

Jan. 2	Terms 2 and 4 classes start
Jan. 4	Terms 2 and 4 fees due
Jan. 16	Last day to withdraw and receive a full refund (Terms 2 and 4)
April 4	Last day to withdraw in order to receive "W" on transcript. After this date, the transcript will show "F" (failure) for all courses dropped
May 21-24	Terms 2 and 4 examinations
TBA	Convocation

General and Psychiatric Nursing 1984/85 (proposed)

1984

June 20	Term 1 fees due for classes starting August 20
July 20	Terms 3 and 5 fees due
Aug. 20	Registration day for Terms 1, 3, 5 students. Terms 2, 3, 4 and 5 classes commence
Aug. 21	Term 1 classes begin
Aug. 24	Terms 2 and 4 fees due for classes started August 20
Sept. 4	Last day to withdraw in order to receive a full refund minus $75 commitment fee (Terms 1, 3, and 5)
Nov. 2	Term 1 fees due for classes starting January 2, 1985
Nov. 10	Last day to withdraw in order to receive "W" on transcript. After this date, the transcript will show "F" (failure) for all courses dropped.
Dec. 3	Term 3 fees due for classes starting January 2, 1985
Dec. 7	Term 5 fees due for classes starting January 7, 1985
Dec. 10-14	Term 1, 2, 3, 4 and 5 examinations

1985

Jan. 2	Registration Day for Terms 1 and 3 students
Jan. 4	Term 2 and 4 fees due for classes started January 2
Jan. 7	Term 5 registration and classes commence
Jan. 16	Last day to withdraw in order to receive a full refund (Terms 2 and 4)
March 22	Last day to withdraw in order to receive "W" on transcript. After this date the transcript will show "F" (failure) for all courses dropped
April 29-May 3	Terms 1, 2, 3*, 4 and 5 examinations. *Note: For Psychiatric Nursing students, April 29 and 30th become class days.

Electrical Technology 1984/85 (proposed)

1984

Aug. 6-10	Exemption Levels 1 and 3
Sept. 4	Registration day Levels 1, 2, 3, and Coop 3
Dec. 3-7	Examination Levels 1, 2, and 3

1985

Jan. 2	Registration Levels 1, 2, 3, 4 and Coop. 3
April 9-12	Examinations Levels 1, 2, 3, and 4
April 29	Registration Levels 1, 2, 3, 4 and Coop 3 and 4
Aug. 5-9	Examinations Levels 1, 2, 3 and 4

Diagnostic Medical Sonography 1984/85 (proposed)

1984

July 6	Term 1 fees due for classes commencing September 5
Sept. 4	Registration/Orientation for students for Term 1
Sept. 5	Classes begin
Sept. 18	Last day to withdraw and receive a full refund minus $75 commitment fee (Term 1)
Nov. 9	Last day to withdraw in order to receive "W" on transcript. After this date the transcript will show "F" (failure) for all courses dropped
Dec. 10-14	Term 1 Examinations

1985

Jan. 2	Commence Clinical Phase (Term 2)
Jan. 4	Deadline for Term 2 fees
Jan. 16	Last day to withdraw and receive a full refund (Term 2)
April 4	Last day to withdraw in order to receive "W" on transcript. After this date, the transcript will show "F" failure (failure) for all courses dropped.
April 30	Registration day Levels 1 and 3
Aug. 19-23	Term 2 examinations
TBA	Convocation

Note: There is no summer break for these students

Calendar

1984

January

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1985

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July

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August

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September

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October

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November

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December

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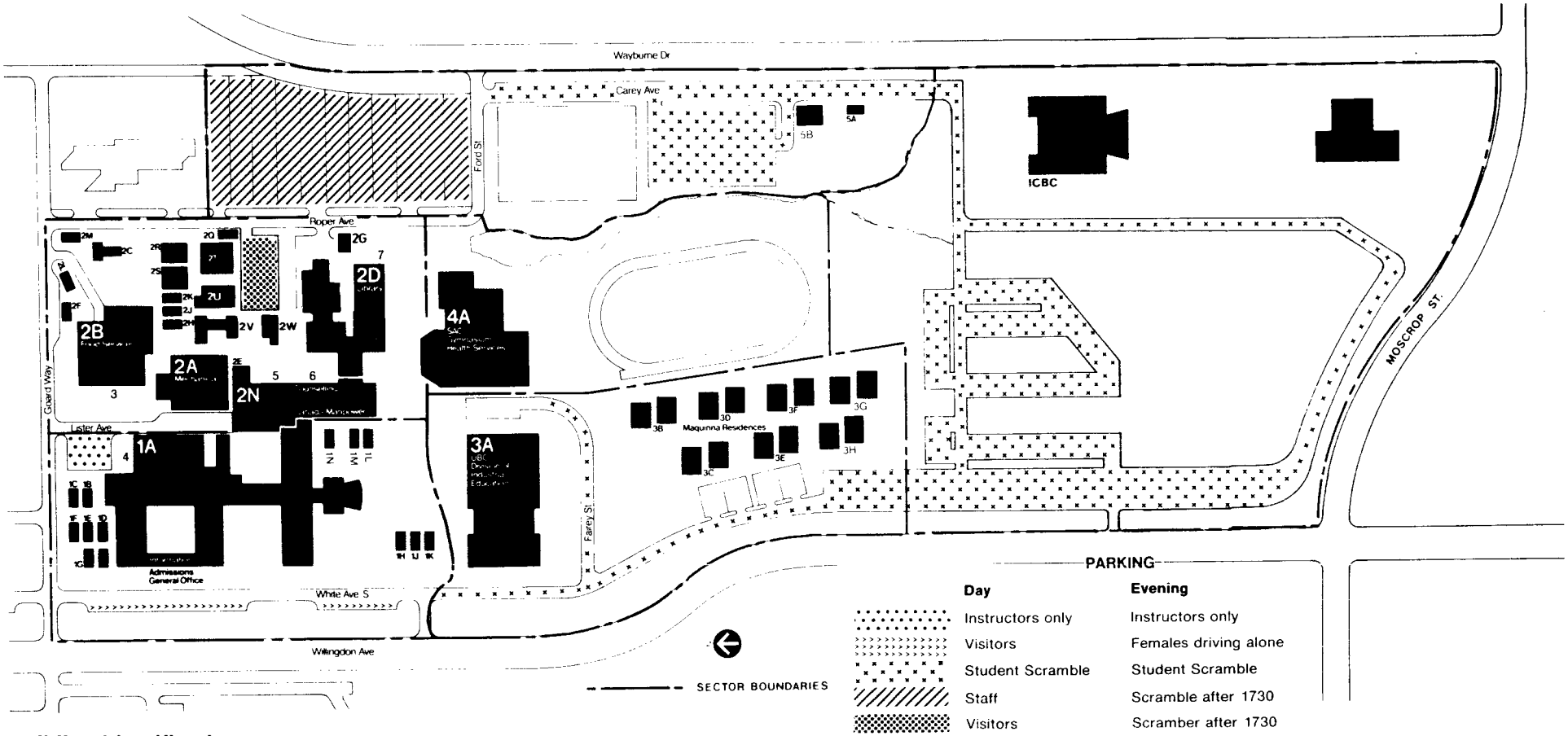

Building Identification

1A	Information; Admissions; Continuing Education; 1962/67 Classroom/Laboratory; Administration
1B	Developments
1C	Distance Education
1D	CEIS Division Offices Training and Development Centre
1E	Mathematics
1F	Mathematics
1G	Industry Services
1H	General Nursing
1J	Psychiatric Nursing
1K	RN and RPN Administration
1L	Continuing Education
1M	Continuing Education
1N	Continuing Education
2A	Mechanical
2B	Food Services and Training (Cafeteria)
2C	Greenhouse; Animal Holding
2D	Library; Broadcasting; Audiovisual; Bookstore
2E	Telephone Exchange
2F	Electrical Sub-Station
2G	PEMC
2H	Distance Education
2J	Distance Education
2K	Food Services
2L	Food Services
2M	Food Training; PVI
2N	1976 Classroom Laboratory; Counselling; Student Financial Aid; Computer Centre; Canada Employment Centre
2Q	Parking
2R	Staff Offices
2S	Classrooms
2T	Security; Lost & Found; Physical Plant
2U	Classrooms
2V	Staff Offices
2W	Classrooms
3A	Teacher Training Centre
3B-3H	Maquinna Residences
4A	Student Activity Centre; Medical Services
5A	Loggers Sports

3 Cafeteria
4 TNT -
5 Snack bar
6 TNT
7 Bookstore

NOTE: A map outlining campus wheelchair routes is available at the information desk.

Index

BCIT

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1964-1984

BCIT BRITISH COLUMBIA INSTITUTE OF TECHNOLOGY
3700 WILLINGDON AVENUE, BURNABY, BRITISH COLUMBIA, CANADA V5G 3H2 434-5734