BRITISH COLUMBIA INSTITUTE OF TECHNOLOGY 1969-1970

BRITISH COLUMBIA INSTITUTE OF TECHNOLOGY

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British Columbia Institute of Technology

3700 Willingdon Avenue
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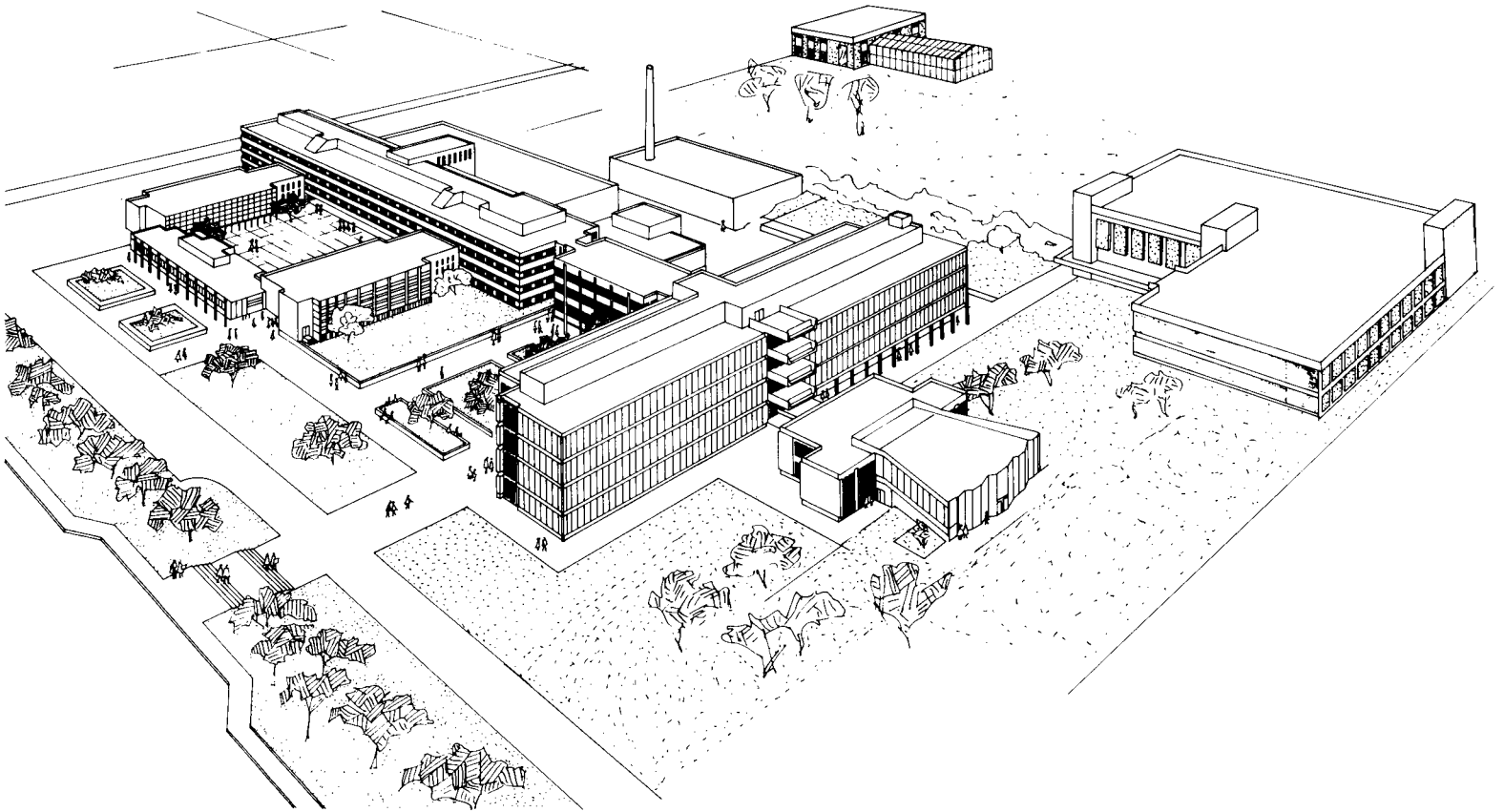

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Deputy Minister of Education

JOHN S. WHITE
Director of Technical and Vocational Education

Aims and Objectives

The British Columbia Institute of Technology, an institution for advanced technical education, is the first of its kind in British Columbia. Opened in 1964 under its first principal, Mr. E. C. Roper, it has already trained a large number who have established a fine reputation for the school by their work in industry as technicians or technologists.

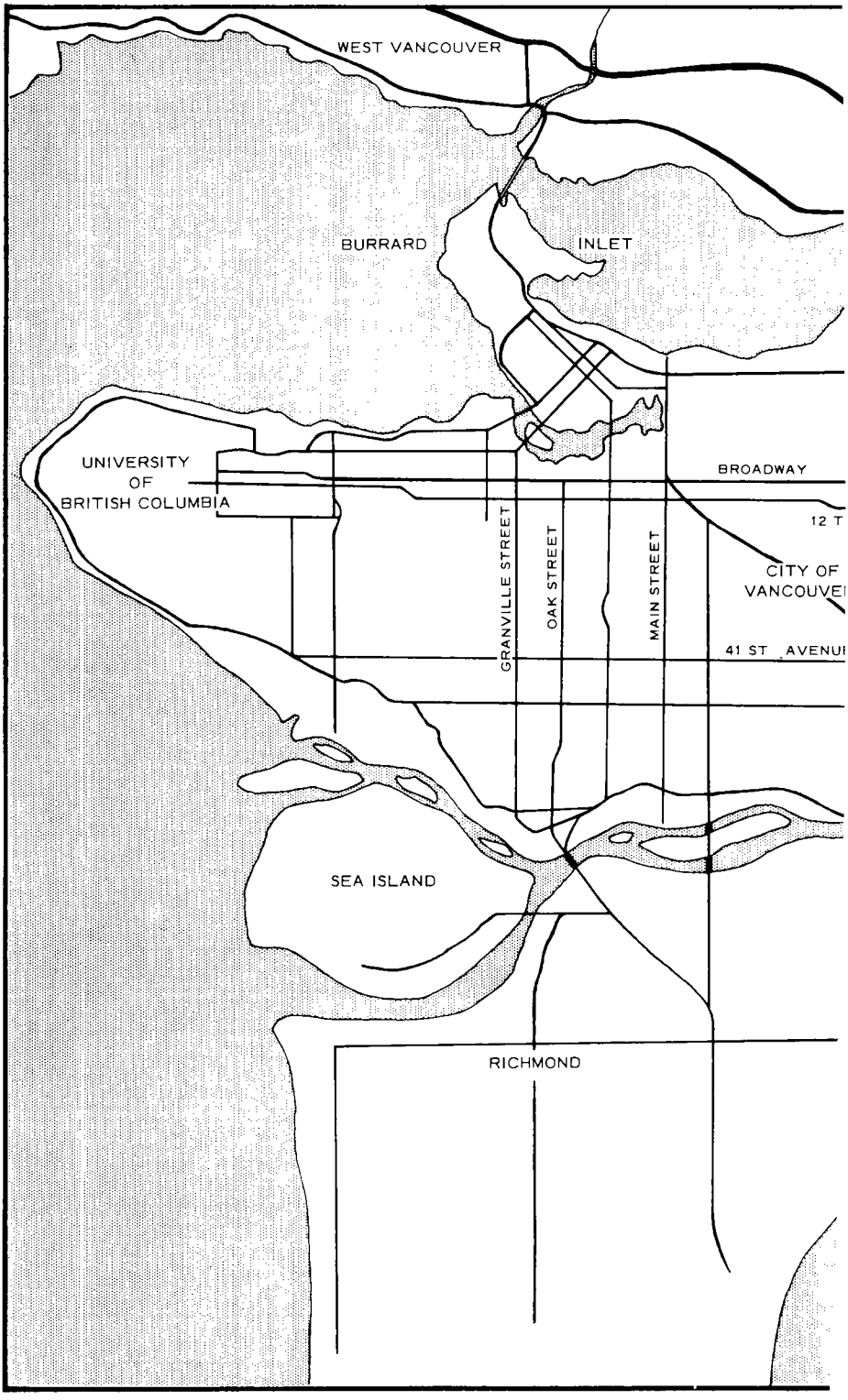
The Institute offers a broad range of two-year technical programmes, each leading to a group of employment opportunities in the major industries of the Province. These programmes are a judicious blend of English, mathematics, the sciences, and very practical work related to the field of employment chosen by the student.

It is a prime aim of the Institute to serve the students as individuals. Many young graduates come directly from high school and are assisted to find their first jobs in industry. Others who have been out of school in industry for some time take advantage of these programmes to find new and more satisfying careers. It is becoming increasingly difficult for the individual to prepare himself for a career in our modern industrial society, and the Institute provides opportunities for training which open doors to suitable careers as technicians and technologists in the labour force.

The programmes of the Institute are designed to serve the industries of the region as well as the individual student. These programmes are established with the particular needs of the industries of the Province in mind. It is the aim of the Institute to produce graduates who, with additional experience, will fill many of the supervisory positions in business and industry.

B.C.I.T., therefore, helps the individual to prepare himself for a more productive and rewarding future and at the same time helps the industry of the region by supplying well-trained employees. And by helping both individual and industry to improve their productivity, the whole community is helped and the standard of living of all its members is improved.

D. H. GOARD, B.A.
Principal, British Columbia Institute of Technology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J. MITCHELL	*Hotel, Motel and Restaurant.*
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P. QUELCH	*Forest Products.*
J. W. RAVEN	*Forest Products.*
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MRS. J. B. WARREN, B.A., M.A.	*Physics.*

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I. V. F. ALLEN	*Forestry.*
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DR. S. M. DRANCE, Associate Professor, Ophthalmology Research Unit, Vancouver General Hospital, Vancouver.

DR. J. MACDONALD, Assistant Professor, Department of Electrical Engineering, Faculty of Applied Sciences, University of British Columbia, Vancouver.

R. E. RIDSDALE, Head, Electrical and Electronics Technology, British Columbia Institute of Technology, Burnaby.

HEALTH DATA PROCESSING ADVISORY COMMITTEE

Members:

DR. D. O. ANDERSON, Professor and Head, Department of Health Care and Epidemiology, Faculty of Medicine, University of British Columbia, Vancouver.

J. D. BRADFORD, Executive Director, British Columbia Hospitals Association, Vancouver.

D. BRECKNER, Chief Instructor, Business Management, British Columbia Institute of Technology, Burnaby.

DR. R. H. PEARCE, Associate Professor, Department of Pathology, Faculty of Medicine, University of British Columbia, Vancouver.

J. W. SHORT, Assistant Administrator, Children's Hospital, Vancouver.

MRS. M. TAGGART, Medical Record Librarian, Health Services Centre, University of British Columbia, Vancouver.

Ex Officio:

S. T. RICHARDS, Head, Health Technology, British Columbia Institute of Technology, Burnaby.

MISS S. L. WILLIAMS, Instructor, British Columbia Institute of Technology, Burnaby.

MEDICAL ISOTOPE ADVISORY COMMITTEE

Chairman:

DR. R. T. MORRISON, Chief of Division of Nuclear Medicine, Department of Radiology, Vancouver General Hospital, Vancouver.

Members:

MISS B. L. ARCHIBALD, Radiation Chemist, Department of Nuclear Medicine, Vancouver General Hospital, Vancouver.

DR. J. A. BIRKBECK, Assistant Professor, Department of Pædiatrics, Faculty of Medicine, University of British Columbia, Vancouver.

DR. E. F. CHRISTOPHERSON, Director, Metropolitan Bio-medical Laboratory Ltd., Vancouver.

DR. T. W. DAVIS, Director, Department of Nuclear Medicine, St. Paul's Hospital, Vancouver.

DR. S. FISHMAN, Director of Chemistry and Isotope Laboratories, Department of Pathology, Shaughnessy Hospital, Vancouver.

DR. P. F. SOLVONUK, Biochemist, Department of Clinical Chemistry, Vancouver General Hospital, Vancouver.

DR. A. E. W. TRITES, Chief of Service, Department of Pathology, Shaughnessy Hospital, Vancouver.

Ex Officio:

W. E. NOEL, Instructor, British Columbia Institute of Technology, Burnaby.
S. T. RICHARDS, Head, Health Technology, British Columbia Institute of Technology, Burnaby.

MEDICAL LABORATORY ADVISORY COMMITTEE

Chairman:

DR. R. W. SPITZER, Biochemist, Department of Pathology, Royal Columbian Hospital, New Westminster.

Ex Officio:

MRS. M. J. BLAIR, Chief Instructor, British Columbia Institute of Technology, Burnaby.
S. T. RICHARDS, Head, Health Technology, British Columbia Institute of Technology, Burnaby.

Members:

DR. E. J. BOWMER, Director, Division of Laboratories, Health Branch, Department of Health Services and Hospital Insurance, Vancouver.
C. F. A. CULLING, Instructor, Department of Pathology, Faculty of Medicine, University of British Columbia, Vancouver.
MISS M. ERSKINE, Technical Supervisor, Clinical Laboratory Services, Department of Health Services and Hospital Insurance, Vancouver.
M. A. FRASER, Associate Director, Royal Jubilee Hospital, Victoria.
DR. G. R. GRAY, Associate Hæmatologist, Department of Pathology, Vancouver General Hospital, Vancouver.
DR. G. M. MARTIN, Chief, Clinical Pathology Service, Royal Inland Hospital, Kamloops.
DR. E. W. SHEPHERD, Pathologist, Royal Inland Hospital, Kamloops.
DR. K. T. THORNTON, Associate Pathologist, Royal Jubilee Hospital, Victoria.

MEDICAL RADIOGRAPHY ADVISORY COMMITTEE

Chairman:

DR. A. SHERKAT, Associate Director, Department of Radiology, St. Paul's Hospital, Vancouver.

Ex Officio:

W. E. NOEL, Instructor, Health Technology, British Columbia Institute of Technology, Burnaby.
S. T. RICHARDS, Head, Health Technology, British Columbia Institute of Technology, Burnaby.

Members:

DR. R. W. BOYD, Director, Department of Radiology, Vancouver General Hospital, Vancouver.
DR. H. BROOKE, Director, Department of Radiology, Burnaby General Hospital, Burnaby.
A. CLIFFE, Senior X-ray Technician, Kelowna General Hospital, Kelowna.
DR. H. M. EDMISON, Director, Department of Radiology, Royal Jubilee Hospital, Victoria.
B. GAGNON, Chief Technician, Department of Radiology, St. Paul's Hospital, Vancouver.

Miss B. Hofner, Supervising Technician, Department of Radiology, St. Joseph's Hospital, Victoria.
J. Logan, Chief Technician, Department of Radiology, Lions Gate Hospital, North Vancouver.
Dr. J. G. McPhee, Director, Department of Radiology, Royal Columbian Hospital, New Westminster.
Dr. C. B. Moss, Director, Department of Radiology, Kelowna General Hospital, Kelowna.
R. Olafsen, Shaughnessy Hospital, Vancouver.
H. Oancia, Chief Technician, Department of Radiology, Royal Columbian Hospital, New Westminster.
Dr. A. Paramonoff, Director, Department of Radiology, Lions Gate Hospital, North Vancouver.
J. Ross, Chief Technician, Department of Radiology, Royal Jubilee Hospital, Victoria.
G. Smith, Chief Technician, Department of Radiology, Burnaby General Hospital, Burnaby.
Dr. F. G. Stuart, Director, Department of Radiology, St. Joseph's Hospital, Victoria.
Dr. A. Turnbull, Director, Department of Radiology, Shaughnessy Hospital, Vancouver.

NURSING ADVISORY COMMITTEE

Chairman:

Dr. Rae Chittick, Vancouver.

Ex Officio:

Mrs. B. B. Kozier, Instructor, British Columbia Institute of Technology, Burnaby.
S. T. Richards, Head, Health Technology, British Columbia Institute of Technology, Burnaby.

Members:

Dr. G. E. Cragg, North Vancouver.
Miss F. A. Kennedy, Director of Education Services, Registered Nurses' Association of British Columbia, Vancouver.
Miss M. M. Lonergan, Nursing Consultant, Mental Health Services Branch, Department of Health Services and Hospital Insurance, Victoria.
Miss E. K. McCann, Acting Director, School of Nursing, University of British Columbia, Vancouver.
Miss E. E. Nordlund, Consultant, British Columbia Hospital Insurance Service, Victoria.
Mrs. W. Reid, Director of Nursing, Burnaby General Hospital, Burnaby.
Mrs. N. Stevens, Registered Nurses' Association of British Columbia, Director of Nursing, Royal Columbian Hospital, New Westminster.
Miss F. Trout, Assistant Administrator, Lions Gate Hospital, North Vancouver.

PUBLIC HEALTH ADVISORY COMMITTEE

Chairman:

Dr. C. J. G. MacKenzie, Assistant Professor, Department of Preventive Medicine, Faculty of Medicine, University of British Columbia, Vancouver.

Ex Officio:

L. E. PENNER, Instructor, British Columbia Institute of Technology, Burnaby.

S. T. RICHARDS, Head, Health Technology, British Columbia Institute of Technology, Burnaby.

Members:

W. BAILEY, Director, Division of Public Health Engineering, Health Branch, Victoria.

E. T. BRADLEY, Public Health Inspector, Burnaby Health Department, Burnaby.

A. C. DOBSON, Chief Health Inspector, North Shore Health Unit, North Vancouver.

DR. G. A. MOTT, Deputy Medical Health Officer, City of Vancouver Health Department, Vancouver.

C. R. STONEHOUSE, Chief Public Health Inspector, Health Branch, Victoria.

J. A. STRINGER, Sanitation Control Officer, City of Vancouver Health Department, Vancouver.

HOTEL, MOTEL AND RESTAURANT MANAGEMENT ADVISORY COMMITTEE

Chairman:

B. FRASER, Managing Director, British Columbia Hotels Association, Vancouver.

Ex Officio:

M. M. COLTMAN, Head, Hotel, Motel and Restaurant Management Technology, British Columbia Institute of Technology, Burnaby.

Members:

M. AMMANN, Queen Elizabeth Theatre Restaurant, Vancouver.

MRS. A. MAYER, Certified Executive Housekeeper, Vancouver.

C. PETER HUDSON, General Manager, Bayshore Inn, Vancouver.

E. BODNARCHUK, Lucky Strike Motor Inn, Vancouver.

E. SCHMUTZ, Co-ordinator, Accommodation and Food Services, British Columbia Government, Burnaby.

T. S. SMITH, Manager, Chipper's Drive-ins Ltd., Richmond.

R. J. STOUT, Director, Purchasing and Commissary, White Spot Restaurants Ltd., Vancouver.

INSTRUMENTATION ADVISORY COMMITTEE

Chairman:

C. R. Ross, Manager, Instrumentation Department, H. A. Simons (Intl.) Ltd.

Ex Officio:

J. O. HULBERT, Head, Instrumentation Technology, British Columbia Institute of Technology, Burnaby.

Members:

J. U. CALDICOTT, Assistant Engineer (Instrumentation), Central Engineering, MacMillan Bloedel Limited, Vancouver.

E. R. DALLAS, Vice-President, Northern Columbia Process Equipment Company, North Vancouver.

J. G. KENYON, British Columbia President, Instrument Society of America.

H. M. MATHER, Superintendent, Communications and Testing, British Columbia Hydro and Power Authority, Vancouver.

W. V. NICHOLSON, Chief Instrument Engineer, Cominco Ltd., Trail.

A. C. VAN DERENDE, British Columbia Institute of Technology graduate, British Columbia Research Council, Vancouuver.

LIBRARY ADVISORY COMMITTEE

Chairman:

B. F. STUART-STUBBS, Head Librarian, University of British Columbia, Vancouver.

Ex Officio:

R. HARRIS, Librarian, British Columbia Institute of Technology, Burnaby.

Members:

I. F. BELL, Associate Librarian, University of British Columbia, Vancouver.

MRS. A. BREARLEY, Assistant Professor, School of Librarianship, University of British Columbia, Vancouver.

W. S. LANNING, Associate Professor and Director of Curriculum Laboratory, University of British Columbia, Vancouver.

MISS A. R. LEITH, Head, Science Division, Library, University of British Columbia, Vancouver.

MISS A. TUFTS, Head, Business Division, Vancouver Public Library, Vancouver.

MECHANICAL ADVISORY COMMITTEE

Ex Officio:

D. K. BANNERMAN, Head, Mechanical Technology, British Columbia Institute of Technology, Burnaby.

Members:

P. N. BLAND, Engineer, H. A. Simons (International) Ltd., Vancouver.

R. D. BREWER, President, Hy-Torq Manufacturing Ltd., North Surrey.

DR. J. P. DUNCAN, Head, Department of Mechanical Engineering, University of British Columbia, Vancouver.

D. F. GUNNING, Superintendent, Rolling Mill Division, Western Canada Steel Ltd., Vancouver.

F. R. KILLAM, President, Industrial Coatings Ltd., Vancouver.

W. E. MILLS, Senior Mechanical Engineer, Department of Public Works, Victoria.

W. F. PAGE, Machine Shop Foreman, Burrard Drydock Co. Ltd., North Vancouver.

N. PURSELL, Senior Engineer, International Power & Engineering Consultants Ltd., Vancouver.

E. S. RHODES, Project Manager, H. A. Simons (International) Ltd., Vancouver.

W. O. RICHMOND, Professor, Department of Mechanical Engineering, University of British Columbia, Vancouver.

L. F. WRIGHT, Vice-President, Wright Engineers Ltd., Vancouver.

MINING TECHNOLOGY ADVISORY COMMITTEE

Chairman:

L. G. R. CROUCH, Professor of Mining Engineering, Department of Mining and Metallurgy, University of British Columbia, Vancouver.

Ex Officio:

A. H. MANIFOLD, Acting Department Head, Mining Technology, British Columbia Institute of Technology, Burnaby.

Members:

W. S. ADAMS, Executive Assistant, Curriculum, Vancouver School Board, Adult Education Department, Vancouver.

DR. J. A. GOWER, Associate Professor, Department of Geology, University of British Columbia, Vancouver.

J. D. LITTLE, Vice-President, Operations, Placer Development Ltd., Vancouver.

J. W. PECK, Chief Inspector of Mines, British Columbia Government, Victoria.

E. C. ROPER, Consultant, Vancouver.

NATURAL GAS AND PETROLEUM ADVISORY COMMITTEE

Chairman:

A. G. KANEEN, Chief Inspector, Department of Public Works, Gas Inspection Branch, Vancouver.

Ex Officio:

I. M. ANDERSON, Acting Department Head, Natural Gas and Petroleum Technology, British Columbia Institute of Technology, Burnaby.

Members:

H. BECKETT, Technical Superintendent, Imperial Oil Enterprises Ltd., Ioco.

W. A. JACKSON, Manager, Western Pacific Products & Crude Oil Pipelines Ltd., Vancouver.

R. KADLEC, Inland Natural Gas Co., Vancouver.

K. KIDD, Gas Division, British Columbia Hydro and Power Authority, Burnaby.

J. D. LINEHAM, Chief of Petroleum and Natural Gas Division, Department of Mines and Mineral Resources, Victoria.

G. B. MCGILLIVRAY, Manager, British Columbia Division, Canadian Petroleum Association, Victoria.

R. D. TOEWS, Westcoast Transmission Co. Ltd., Vancouver.

SURVEYING ADVISORY COMMITTEE

Chairman:

D. J. ROY, Land Surveyor and Civil Engineer, Vancouver.

Ex Officio:

D. R. MASON, Surveying Technology, British Columbia Institute of Technology, Burnaby.

Members:

A. BURHOE, Assistant City Surveyor, Vancouver.

S. H. DE JONG, Associate Professor, Department of Civil Engineering, University of British Columbia, Vancouver.

A. T. HOLMES, Partner, Underhill and Underhill, Surveyors and Civil Engineers, Vancouver.

W. N. PAPOVE, Partner, McElhanney Associates, Land Surveyors, Vancouver.

Calendar

1969

JULY

S	M	T	W	T	F	S
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6	7	8	9	10	11	12
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AUGUST

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SEPTEMBER

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OCTOBER

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DECEMBER

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1970

JANUARY

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FEBRUARY

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MARCH

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APRIL

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MAY

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JUNE

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28	29	30				

Calendar of Events, Academic Year 1969–70

1969

July 1 - - - - Commencement of academic year.

August 11 - - - Closing date of applications for admission.

September 2, 3, and 4 - Registration of students.

September 8 - - - First and third term—classes begin.

October 13 - - - Thanksgiving Day holiday.

November 11 - - Remembrance Day holiday.

December 20 - - Christmas vacation commences.

1970

January 5 - - - Second and fourth term—classes begin.

March 9 to 13 - - Spring vacation.

March 27 - - - Good Friday holiday.

March 30 - - - Easter Monday holiday.

May 18 - - - - Victoria Day holiday.

May 29 - - - - Summer vacation commences.

June 12 - - - - Convocation.

June 30 - - - - Conclusion of academic year.

General Information

THE INSTITUTE PROGRAMME

The objective of the Institute programme is to provide graduate technologists equipped to meet the needs of industry. Changes in the courses are made only after careful consideration and on the advice of members of the Advisory Committee, employers of graduates, and representatives of various professional organizations.

In the first year there is a common programme of study for most technologies. The subjects have been selected to give students the fundamental principles common to all branches of the technologies.

In both years basic principles and their applications are stressed in the lecture room, and these principles are tested and verified in the laboratories. The laboratory work is organized into groups of experiments. These experiments have been developed to permit students to test ideas formulated in the lecture room, to acquire familiarity with testing and designing techniques, and to develop dexterity in handling experimental equipment. The effectiveness of this approach is reflected in the increased number of students seeking admission to the various programmes and in the demand on the part of industry for services of the graduates of institutes of technology.

I. ENROLMENT

A. Conditions of Admission

1. *General Prerequisites.*—All student applicants must show documentary proof that they have graduated from Grade XII on the Academic and Technical Programme or the equivalent.

Students are referred to each technology for the additional special prerequisites required for enrolment in that technology.

Because the Institute's requirements for admission are new to the British Columbia school system, and because all secondary schools do not offer all the desirable prerequisites, unavoidable deficiencies in draughting, chemistry, physics, or biology will not necessarily preclude admission to an Institute programme.

2. Applicants educated outside of British Columbia should submit their qualifications to the Registrar of the Institute. Foreign language students must give evidence of reasonable competence in both written and spoken English.

3. A person whose education has been interrupted who, though lacking some of the formal admission requirements, can give evidence of probable success in a course may be admitted as a mature student. Such applications are dealt with on an individual basis. Persons interested should consult with the Registrar of the Institute.

4. Applicants who have successfully completed a programme of study at another post-secondary institution, or whose qualifica-

tions warrant consideration, may make application to the Board of Admissions for up to one year advanced standing.

5. All prospective students must be at least 16 years of age. However, there is no upper age limit.

6. In any programme the Board of Admissions reserves the right to accept only those applicants who appear to have the capabilities necessary for success in the programme.

B. PROCEDURE FOR ADMISSION

1. Application forms may be obtained from the Registrar's Office.

2. The following documents and material must accompany the application:

(i) An official transcript of all secondary (British Columbia) or high school *and* university marks, showing necessary credits and grades for admittance to programme desired; or

(ii) A statement from the principal of a senior secondary school stating that applicant is expecting to obtain necessary credits and grades for admittance to the programme desired. *This statement must be substantiated by an official transcript when it becomes available.*

(iii) Academic documents will not be returned whether an applicant is accepted or not accepted for enrolment by the Board of Admissions.

(iv) A registration fee of five dollars ($5), payable by certified cheque or money order. Please send this amount only, with this application form. If your application is accepted, this fee is not refundable.

3. A medical questionnaire must be completed, and medical fitness determined prior to final acceptance.

4. All Health Technology students will be required to show evidence of having had a recent chest X-ray and having completed an immunization programme prior to registration. If, due to extenuating circumstances, supporting documentation is not available at the time of registration, students will be required to complete the necessary procedures at the Institute's health service clinic.

5. Registration dates are September 2, 3, and 4, 1969. Students will be notified as to exact time they are required to register. All enrolling students must appear at the Institute or clarify their intentions by letter or wire before noon of the day of registration, otherwise their position may be forfeited.

C. COUNSELLING

There is available to students and prospective students a counselling service which will assist students in making academic, per-

sonal, and financial decisions. In addition to the counsellors, the department heads and general staff can be utilized in aiding the individual student with any problems.

D. APTITUDE TESTS

Aptitude tests will be written by any or all students at the discretion of the Registrar.

II. FEES

A. ANNUAL FEES

The present fee structure is as follows, however these are subject to change from time to time:—

	Tuition	Student Activity	Caution Account	Accident Insurance	Total
First-year students—					
First term	$60.00	$20.00	$10.00	$4.00	$94.00
Second term	90.00	*Nil*	*Nil*	*Nil*	90.00
Second-year students—					
Third term	60.00	20.00	10.00	4.00	94.00
Fourth term	90.00	*Nil*	*Nil*	*Nil*	90.00

1. Students re-entering the Institute for the second and fourth terms, after not attending the Institute for one or more terms, must pay a $10 student activity fee and a $10 caution account deposit and a $2 insurance fee.

2. All cheques and money orders must be payable to the British Columbia Institutue of Technology.

3. All fees are payable prior to the commencement of classes.

4. A student whose fees are not paid within 14 days after the commencement of each term will be excluded from classes and his registration cancelled.

5. If a student, whose registration has been cancelled because of non-payment of fees, applies for reinstatement and his reinstatement has been approved by the Registrar, he will be required to pay a reinstatement fee of $10 together with all outstanding fees before he is permitted to resume classes.

B. MISCELLANEOUS FEES

Application and registration	$5.00
Re-read of final marks	5.00
Transcript of marks	2.00
Duplicate diploma	3.00
Reinstatement fee	10.00

C. REFUND OF FEES

(*a*) From the date of commencement of the term until 14 days later, inclusive of both dates:

(1) Tuition—complete refund.
(2) Caution account—balance of account.
(3) Student activity—complete refund.
(4) Accident insurance—complete refund.

(*b*) From the day following the last day specified in (*a*) above until 15 days later, inclusive of both dates:
(1) Tuition—50 per cent refund.
(2) Caution account—balance of account.

(*c*) From the day following the last day specified in (*b*) above until 15 days later, inclusive of both dates:
(1) Tuition—25 per cent refund.
(2) Caution account—balance of account.

(*d*) From the day following the last day specified in (*c*) above until the end of the term:
(1) Tuition—no refund.
(2) Caution account—balance of account.

D. WITHDRAWAL

Students must withdraw officially through the Registrar's Office.

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

E. ADDITIONAL EXPENDITURES

1. *Textbooks, Instruments, and Supplies.*—The cost of textbooks, instruments, and supplies varies according to the programme, from approximately $60 to $125. The Institute bookstore carries a complete line of draughting and writing supplies. Students are advised not to make any purchases until they have received a book list showing the required texts.

2. *Medical Insurance.*—Students may obtain medical insurance by arrangement with the British Columbia Medical Plan. By Order in Council of the Provincial Government, all private companies have been prohibited by an Act of the Provincial Legislature from paying for physicians' and surgeons' services effective July 1, 1968. Students are advised to confirm that they are covered under their parents' British Columbia Medical Plan; should this not be the case, students are advised to make their own arrangements with the British Columbia Medical Plan. Pamphlets outlining the details are available from the Registrar's Office.

III. FINANCIAL ASSISTANCE

A. GOVERNMENT OF BRITISH COLUMBIA SCHOLARSHIPS

This award is available for the current year to a student who undertakes a full-year programme at the British Columbia Institute

of Technology. Candidates for awards applicable to the session 1970–71 will be considered on the basis of standing received in the final examinations for 1969–70. Candidates at the British Columbia Institute of Technology must take the final examinations set by the Institute in June; those in Grade XII or XIII must write the examinations set in June by the British Columbia Department of Education, and make application at the principal's office of the secondary school attended. Eligible applicants who obtain first-class standing will be granted three-quarters of the tuition fee. Awards of one-half and one-third the tuition fee will also be made to the Province's top second-class students.

B. British Columbia Institute of Technology Scholarship and Bursary Fund

The British Columbia Institute of Technology Scholarship and Bursary Fund has been established through private means, whereby awards are made annually by the trustees of the Fund to deserving students of the Institute. Private contributions from commerce and industry and other interested persons are being received and may or may not be designated for use in encouraging study in a particular course of study given by the Institute. Such contributions will be deductible for income-tax purposes. Pages 59 to 68 contain the details of the contributions. Inquiries concerning financial aid should be directed to the office of the Registrar.

C. The Canada Student Loans Plan

The maximum that may be obtained under this plan is $1,000 per year and not more than $2,000 over two years. The Canada Student Loans Plan was set up to supplement family and other financial sources available to students, not to replace them. Loans are made only if the student can establish that the financial resources available, including those of the parents, are not sufficient to meet what the awarding authority considers to be reasonable costs for the academic year.

Loans are interest-free while the student is enrolled in an eligible post-secondary educational institution, and are repayable with interest commencing six months after graduation.

Loan applicants must establish residence requirements and be academically qualified before being eligible.

For application forms and further information inquire at the Co-ordinator of Student Activities office (209).

IV. PLACEMENT SERVICE

The Student Placement Centre, staffed by Canada Manpower personnel, is available to all students of the Institute.

This office, besides providing a counselling and employment service, arranges seminars and interviews with national and local employers of the technologist.

To assist the student in further development of his career plan, a current library of information on careers in many industries is maintained in the Centre.

V. LIVING ACCOMMODATION

There are no dormitories connected with the Institute. Students may obtain room and board in the vicinity of the campus at a reasonable rate (approximately $90 to $100 a month for three meals a day).

A list of accommodations will be available to students at the Co-ordinator of Student Activities office (209), and a list will be issued to students at registration. An excellent cafeteria provides economical services for students.

VI. ACADEMIC AWARDS

A. Diplomas (Dipl.T.)

Graduates of the British Columbia Institute of Technology will be awarded a nationally recognized Diploma of Technology. An honours diploma will be awarded to those students who obtain a first-class honours standing (80 per cent average or better) in each of Terms 3 and 4. Duplicate diplomas will be issued on payment of a fee of $3.

B. The British Columbia Institute of Technology Honour Awards

The Academic Award will be presented to the top academic student in his graduating year.

The Citizenship Award will be presented to the 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.

C. Convocation Exercises

Convocation exercises take place as announced in the yearly academic calendar, and diplomas are presented only at these exercises.

VII. THE CURRICULUM

A. Programme of Studies

The academic year consists of two separate consecutive terms. Examinations are written and credit is given for the successful completion of each term. Students may interrupt their studies after completion of any term. Permission by the Board of Ad-

missions is required before a student is allowed to change his programme, and only one transfer is permitted.

B. Determination of Standing

Final standing is determined on the basis of term work and the results of examinations. A minimum of 50 per cent in each subject is required for a credit standing. Standing is computed according to the following schedule:

First class	80% or more
Second class	65% to 79%
Credit	50% to 64%
Failure	Below 50%

The symbol "A" (ægrotat) indicates that the student was absent from the final examination because of medical reasons but was granted standing on the basis of the year's work. "Ægrotat" standing may apply to all subjects or to a single subject. A copy of the final report is mailed to the student's home address as soon as possible after the results are known.

C. Failure and Repetition

A student who fails a term may be permitted to repeat the term only at the discretion of the Principal.

D. Appeals in Regard to Final Marks

Final examinations may be re-read if a written request is submitted to the Registrar within 10 days after the results are mailed to students. A fee of $5 is required for each paper which is appealed. This fee will be refunded in full if, as a result of re-reading, the original mark is favourably adjusted.

E. Transcripts

A fee of $2 is charged for each transcript of an undergraduate's or graduate's marks. Transcripts are available from the Registrar's Office.

VIII. REGULATIONS REGARDING CONDUCT, DISCIPLINE, AND ATTENDANCE

It is assumed that all students enrolled at the British Columbia Institute of Technology come for a serious purpose, and that they will conform cheerfully to all regulations.

(*a*) Students are expected to conduct themselves in an exemplary fashion at all times and pay diligent attention to their studies. If the Principal believes a student's

conduct is such that it is detrimental to the interest of the Institute, he may be excluded from further attendance. In assessing a student's capability, the Principal will take into consideration his conduct and attitude, both on and off the campus. A student who has been expelled or suspended will not be admitted to the Institute grounds or buildings.

(*b*) The Institute cannot be held responsible for debts incurred by student organizations.

(*c*) If, through his carelessness or negligence, a student damages the property of the Institute, he 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.

(*d*) A student will not be permitted to borrow or remove any apparatus or tools except by the written authority of the Principal or his delegate.

(*e*) Consumption of intoxicating beverages is not permitted on property belonging to the Institute. Violation of this regulation may result in expulsion.

(*f*) General supervision over all forms of entertainment given under the auspices of a student organization come under the jurisdiction of the Principal.

(*g*) All students are required to dress in a neat and tidy manner in keeping with the dignity of the Institute. For men this means the wearing of the following attire on the campus:

(i) Shirt and tie.

(ii) Business suit, or sports coat or blazer with suitable trousers.

(iii) In laboratory and shops a laboratory coat will be worn in place of the coats or blazers mentioned in item (ii). Students who lose or damage laboratory coats will be charged a $5 replacement fee.

Women should be attired appropriately in accordance with the regulations for men.

(*h*) 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 writing the final examination in that subject. In case of illness or other unavoidable cause of

absence, the student should communicate immediately with his department head, stating the cause of absence.

IX. CHANGES IN CURRICULA AND REGULATIONS

Although it is proposed to adhere to the programme 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 programmes of study or the regulations. The Institute reserves the right to cancel any programme.

X. STUDENT ASSOCIATION

All students registered in the Institute are members of this Association. The governing body of the Association is the Students' Administrative Council, composed of officers elected by the student body. The Council represents the student body and administers student funds as outlined in the constitution of the Student Association.

XI. LOCKER FACILITIES

Full-length locker space is provided for the safe storage of personal effects. Students are warned to have identification marks—preferably names and addresses—on all their books, instruments, and other effects. All personal valuables should be kept on the student's person or secured in his locker. The Institute cannot accept responsibility for any loss of, or damage to, student's personal property.

XII. LIBRARY

The new library building, with a seating capacity for 500 students and space for over 100,000 volumes, was opened in the fall of 1968.

The Library collections number over 20,000 volumes, including representative works in all fields in which the Institute, the British Columbia Vocational School—Burnaby, and the University of British Columbia's Division of Industrial Education give instruction. In addition, the Library subscribes to over 700 periodicals and a variety of other materials selected to support these curriculums. Free access to the reference and general collections is permitted to all students at all times, with the exception of those materials in heavy demand which have been placed on " reserve " at the circulation desk.

The Library provides study carrells and other special study facilities, such as the student typing room, where typewriters and calculating machines are available; audio-visual carrells equipped

for listening to tapes and viewing filmstrips and filmloops; teaching machines; the microfilm reading room; and Xerox copying facilities.

A handbook describing the facilities and services of the Library, and regulations governing Library use, will be distributed during the student orientation period. Information regarding Library tours and other Library instruction will be posted in the Library entrance.

XIII. INSTRUCTIONAL COMMUNICATIONS DEPARTMENT

The basic functions of the Instructional Communications Department are twofold. First, to provide service to the Faculty in facilitating instruction through productive use of media and technology from curriculum planning to actual implementation of learning. Second, to co-ordinate in-service education programme in the theory, methodology, and technology of instruction.

The Department provides assistance to the Faculty in selection, preparation, and application of the newer instructional media to their curriculum requirements.

It maintains the Institute's media library and provides for reference, rental, preview, and purchase of films, slides, videotapes, and other media from major sources throughout the world.

Based on continuing research in educational technology, the Department provides assistance to the Faculty in co-ordinating the design and use of advanced instructional systems such as, CCTV, learning lab., multimedia rear screen projection systems, and individual study facilities.

Limited media facilities are available to students for use in instructional projects.

XIV. STAFF AND STUDENT HEALTH SERVICES

A staff and student health service is available in Room 138. Personnel comprises a part-time doctor and two nurses, one with public health training.

The aim of the service is to prevent disease. This is done by immunizing students, where necessary, against those diseases for which an efficient agent has been developed. Though not mandatory, all students are encouraged to take advantage of this protection. Through the Department of Tuberculosis Control, a chest survey is offered to all personnel once a year. It is hoped in the future to offer some type of dental programme.

For those diseases for which no recognized prevention is available, the health service offers a first-line defence. This is done by counselling, and treatment of the acute phase of illnesses or injuries.

At all times it is the object of the health service to co-operate with the individual's practising physician, reference being made to them when definite or long-term treatment is necessary.

A minimal-cost dental service is available at the Faculty of Dentistry, University of British Columbia, undertaken by the dental students under supervision.

In the Vancouver General Hospital Out-patients' Department, a dental clinic is open from 8.30 a.m. to 4.30 p.m. week-days. Emergency service is available in the hospital emergency after hours for students requiring treatment.

EXTENSION DIVISION

I. Information

For complete information on the Extension Division, write Vice-Principal, Extension, British Columbia Institute of Technology, 3700 Willingdon Avenue, Burnaby 2, British Columbia, or phone 434-5722.

II. Aims and Objectives

The British Columbia Institute of Technology is an institution for advanced technical education, and will continue to make its excellent facilities available for continuing education in the evening in a variety of technical and commercial fields.

Any of the evening programmes offered demand not only ability, but strong motivation and serious effort on the part of the student.

As the demand grows, the Institute, in co-operation with industry through its advisory committees, will expand the number of subjects offered to satisfy the post-secondary technical training needs of almost every segment of trade, commerce, and industry.

The function of the Extension Division is to determine and, if necessary, attach priorities to the advanced technical training needs of adults in industry and then to design programmes and courses to meet these needs so that adults may quickly and efficiently obtain needed skills and knowledge and at the same time integrate this new knowledge with their respective backgrounds.

Continuing education at an advanced level with high standards of instruction is our goal.

III. What the Extension Division Offers

1. The Extension Division of the British Columbia Institute of Technology will give priority to post-secondary training programmes at the level and generally related to the full-time programmes in engineering, business, or health, provided there is both a demand and need for such training. British Columbia Institute of Technology was designed and equipped and is expected to serve these needs.

2. The Extension Division of the British Columbia Institute of Technology will co-operate with organizations to present advanced technical training to assist students to complete the syllabi of associations. Where possible this education will be offered through regular extension courses available under programmes in 1. The Extension Division also will encourage these associations to accept B.C.I.T. examinations as credit for their respective programmes.

3. Some students seek only one course in a subject. They may do so even though a course may be part of a programme. The

Extension Division will also offer some general non-programme courses.

4. The British Columbia Institute of Technology will assist in the design and offer advanced technical courses to a company, but preferably to an industry, provided such training is not already available at a convenient time or in the form needed.

5. A further important function of the Extension Division is to provide a service of continuing education to the graduates of this Institute or of similar programmes.

6. The Extension Division, as a by-product of its regular function, will provide a service to day students who could not be accommodated. Students with advanced credit may require Extension courses to proceed to the next level in the day programme. Similarly, students of the day programme who fail some subjects may wish to repeat these subjects through the Extension Division while working and then return to full-time day studies at the next level.

7. The Extension Division has assumed some responsibility to carry on the work of the British Columbia Work Study Centre.

8. The Extension Division may also provide preparatory courses to entry to the British Columbia Institute of Technology if this need must be met and is not adequately served through other educational institutions in the community.

9. When space permits, the Extension Division will facilitate and encourage meetings and seminars of an Educational nature or value. These should be related to the educational scope of the Institute.

British Columbia Institute of Technology
Scholarship and Bursary Fund

BRITISH COLUMBIA INSTITUTE OF TECHNOLOGY SCHOLARSHIP AND BURSARY FUND

Contributors, 1968

ACRES WESTERN LIMITED ($25)

This donation to be directed to a deserving student at the Institute of Technology, and to be awarded at the discretion of the trustees of the Scholarship and Bursary Fund.

AMERICAN SMELTING AND REFINING COMPANY ($100)

American Smelting and Refining Company will award a $100 bursary or scholarship to a student in the Mining Technology.

AMERICAN SOCIETY FOR METALS ($300)

The American Society for Metals will award two $150 scholarships or bursaries to students in the Chemical and Metallurgical Technology.

BAY FOREST PRODUCTS LTD. ($100)

Bay Forest Products Ltd. will award a $100 scholarship or bursary to a student in the Forest Products Technology.

BETHLEHEM COPPER CORPORATION LTD. ($500)

Bethlehem Copper Corporation Ltd. will award bursaries or scholarships in the total amount of $500 to students in the Chemical and Metallurgical Technology.

BRITISH COLUMBIA FOREST PRODUCTS LIMITED ($500)

British Columbia Forest Products Limited will award two $250 scholarships to second-year students—one in the Forest Products Technology and one in the Instrumentation Technology.

BRITISH COLUMBIA HOTELS ASSOCIATION ($500)

The British Columbia Hotels Association will award bursaries or scholarships in the total amount of $500 to students in the Hotel, Motel and Restaurant Technology.

BRITISH COLUMBIA HYDRO AND POWER AUTHORITY ($450)

The British Columbia Hydro and Power Authority will award two bursaries and one scholarship of $150 each to students at the Institute of Technology, to be awarded at the discretion of the trustees of the Scholarship and Bursary Fund.

BRITISH COLUMBIA INSTITUTE OF TECHNOLOGY STUDENTS' ASSOCIATION ($200)

This donation has been directed to deserving students at the Institute of Technology, to be awarded at the discretion of the trustees of the Scholarship and Bursary Fund.

BRITISH COLUMBIA SUGAR REFINING COMPANY, LIMITED ($250)

British Columbia Sugar Refining Company, Limited, will award a $250 scholarship or bursary, to be awarded at the discretion of the trustees of the Scholarship and Bursary Fund.

BRITISH COLUMBIA SECTION, CANADIAN INSTITUTE OF MINING AND METALLURGY ($140)

The British Columbia Section, Canadian Institute of Mining and Metallurgy, will award a $140 scholarship or bursary to a student in the Natural Gas and Petroleum Technology or the Chemical and Metallurgical Technology.

CANADIAN FOREST PRODUCTS LTD. ($500)

This donation has been directed to a deserving student at the Institute of Technology, to be awarded at the discretion of the trustees of the Scholarship and Bursary Fund.

CANADIAN BROADCASTING CORPORATION ($450)

This donation has been directed to deserving students at the Institute of Technology, to be awarded at the discretion of the trustees of the Scholarship and Bursary Fund.

CANADIAN INFORMATION PROCESSING SOCIETY, VANCOUVER SECTION ($150)

This donation has been directed to a deserving student at the Institute of Technology, to be awarded at the discretion of the trustees of the Scholarship and Bursary Fund.

CANADIAN PULP AND PAPER ASSOCIATION ($500)

The Canadian Pulp and Paper Association will award a $250 scholarship and two $125 bursaries to students in the Pulp and Paper Option of the Forest Products Technology.

CANADIAN RESTAURANT ASSOCIATION ($200)

The Canadian Restaurant Association will award a $200 bursary to a student in the Hotel, Motel and Restaurant Management Technology.

CANADIAN TELEPHONES AND SUPPLIES LTD. ($50)

This donation has been directed to a deserving student at the Institute of Technology, to be awarded at the discretion of the trustees of the Scholarship and Bursary Fund.

CANADA PACKERS LIMITED ($150)

Canada Packers Limited will award a $150 scholarship or bursary to a student in the Food Technology.

CANADA SAFEWAY LIMITED ($300)

Canada Safeway Limited will award a $150 scholarship or bursary to a student in each of the Food Technology and Business Management Technology.

THE CATTERMOLE-TRETHEWEY CONTRACTORS LTD. ($100)

This donation has been directed to a deserving student at the Institute of Technology, to be awarded at the discretion of the trustees of the Scholarship and Bursary Fund.

COMINCO LTD. ($500)

Cominco Ltd. will award one scholarship of $250 to a student in the Mining Technology and one scholarship of $250 to a student in the Chemical and Metallurgical Technology.

COMPUTECH CONSULTING CANADA LTD. ($150)

Computech Consulting Canada Ltd. will award a scholarship to a student in the Computer Programming and Systems Option in the Business Management Technology.

CRAIGMONT MINES LIMITED ($700)

Craigmont Mines Limited will award two $350 scholarships to students in any of the following technologies: Chemical and Metallurgical, Mining, or Surveying.

CROWN ZELLERBACH CANADA FOUNDATION ($1,000)

The Crown Zellerbach Canada Foundation will award four $250 bursaries. Students in the Forestry, Forest Products, Survey, Mechanical, Electrical and Electronics, Chemical and Metallurgical, Instrumentation, and Business Management Technologies are eligible for these awards.

THE T. EATON CO. CANADA LIMITED SERVICE AWARDS ($500)

The T. Eaton Co. Canada Limited will award two $250 scholarships to students in the Marketing or Retailing Option of the Business Management Technology. Selection of winners is from group of first-year students who are offered summer employment with Eatons between their first and second years.

ELECTRICAL EQUIPMENT ASSOCIATION OF B.C. ($100)

The Electrical Equipment Association of B.C. will award a scholarship or bursary to a student in the Electrical and Electronics Technology.

ELECTRIC POWER EQUIPMENT LIMITED ($150)

Electric Power Equipment Limited will award a $150 bursary to a student in the Electrical and Electronics Technology.

ELECTRO TEC MARKETERS, LTD. ($100)

Electro Tec Marketers, Ltd., will award a $100 bursary to a student in the Electrical and Electronics Technology.

ELWORTHY AND COMPANY LIMITED ($100)

Elworthy and Company Limited will award a $100 scholarship or bursary to a student in the Electrical and Electronics Technology.

ENDAKO MINES LTD. (N.P.L.) ($700)

Endako Mines Ltd. (N.P.L.) will award two $350 scholarships to students in any of the following technologies: Chemical and Metallurgical, Mining, or Surveying.

FALCONBRIDGE NICKEL MINES LIMITED ($300)

Falconbridge Nickel Mines Limited will award bursaries or scholarships in the total amount of $300 to students in the Mining or Surveying Technologies.

FINNING TRACTOR & EQUIPMENT CO. LTD. ($500)

Finning Tractor & Equipment Co. Ltd. will award a $200 scholarship to a student in the Business Management Technology. The balance of $300 will be awarded at the discretion of the trustees of the Scholarship and Bursary Fund.

FISHERIES ASSOCIATION OF BRITISH COLUMBIA ($150)

Fisheries Association of British Columbia will award a $150 scholarship or bursary to a student in the Food Technology.

FRASER VALLEY MILK PRODUCERS ASSOCIATION ($150)

The Fraser Valley Milk Producers Association will award a $150 scholarship or bursary to a student in the Food Technology.

GEORGE MACBRYER SCHOLARSHIP

The George MacBryer Scholarship has been established by the Truck Loggers' Association to honour the memory of the late George MacBryer. An initial donation was made by the Truck Loggers' Association ($1,000), and additional donations have been received from Randall Logging Limited ($100) and Nalos Logging Limited ($200).

DEAN H. GOARD AWARD ($100)

This donation has been directed to a deserving student at the Institute of Technology, to be awarded at the discretion of the trustees of the Scholarship and Bursary Fund.

HOOKER CHEMICALS LIMITED ($100)

This donation has been directed to a deserving student at the Institute of Technology, to be awarded at the discretion of the trustees of the Scholarship and Bursary Fund.

HOYLES, NIBLOCK AND ASSOCIATES ($150)

This donation has been directed to a deserving student at the Institute of Technology, to be awarded at the discretion of the trustees of the Scholarship and Bursary Fund.

HUDSON'S BAY COMPANY ($150)

Hudson's Bay Company will award a $150 bursary to a student in the Business Management Technology.

INDUSTRIAL COATINGS LTD. ($300)

Industrial Coatings Ltd. will award a bursary or bursaries in the total amount of $300 to a student or students in the Mechanical Technology.

THE HILDA M. INGHAM MEMORIAL SCHOLARSHIP AND BURSARY FUND ($250)

The Hilda M. Ingham Memorial Scholarship and Bursary Fund has been donated by the North Shore Private Hospital and is to be awarded to students in the Nursing Programme of the Health Technology.

INTERNATIONAL NICKEL COMPANY OF CANADA LIMITED ($300)

International Nickel Company of Canada Limited will award one or more scholarships with a value from a minimum of $100 to a maximum of $250 to students in Engineering Technologies.

INTERNATIONAL POWER AND ENGINEERING CONSULTANTS LIMITED ($300)

International Power and Engineering Consultants Limited will award three $100 bursaries—one bursary each to students in Civil and Structural Technology, Electrical and Electronics Technology, and Mechanical Technology.

JONES ASSOCIATES INC. ($600)

Jones Associates Inc. will award four scholarships of $150 each to students in the Surveying Technology.

MACMILLAN BLOEDEL LIMITED ($500)

MacMillan Bloedel Limited will award one scholarship of $250 to a student in the Forestry Technology and one scholarship of $250 to a student in the Forest Products Technology.

MCCARTER, NAIRNE AND PARTNERS ($150)

McCarter, Nairne and Partners will award a $150 scholarship to a student in the Building Technology.

NABOB FOODS LTD. ($150)

Nabob Foods Ltd. will award a $150 bursary to a student in the Food Technology.

PACIFIC LOGGING COMPANY LIMITED ($300)

This donation has been directed to a deserving student at the Institute of Technology, to be awarded at the discretion of the trustees of the Scholarship and Bursary Fund.

PLACER DEVELOPMENT, LIMITED ($700)

Placer Development, Limited, will award two $350 scholarships to students in any of the following technologies: Chemical and Metallurgical, Mining, or Surveying.

RAYONIER CANADA (B.C.) LIMITED ($1,050)

Rayonier Canada (B.C.) Limited will award three $350 scholarships—two scholarships to students in the Forest Products Technology (one scholarship will be given in the Wood Option and one scholarship will be given in the Pulp and Paper Option) and one scholarship to a student in the Forestry Technology. The awards

are available to students who have completed the first year of their course and are proceeding into the second year.

READ JONES CHRISTOFFERSON LIMITED ($100)

Read Jones Christofferson Limited will award a $100 bursary to a student in either the Building Technology or Civil and Structural Technology.

RESEARCH INDUSTRIES LIMITED ($100)

This donation has been directed to a deserving student at the Institute of Technology, to be awarded at the discretion of the trustees of the Scholarship and Bursary Fund.

WILLIAM ROBINSON LIMITED ($150)

William Robinson Limited will award a $150 scholarship to a student in the Food Technology.

ROYAL CITY FOODS LTD. ($150)

Royal City Foods Ltd. will award a $150 scholarship or bursary to a student in the Food Technology.

RUSSELL FOOD EQUIPMENT LIMITED ($300)

Russell Food Equipment Limited will award two $150 scholarships to students in the Hotel, Motel and Restaurant Management Technology.

H. A. SIMONS (INTERNATIONAL) LTD. ($750)

This donation has been directed to deserving students at the Institute of Technology, to be awarded at the discretion of the trustees of the Scholarship and Bursary Fund.

SOCIETY OF INDUSTRIAL AND COST ACCOUNTANTS OF BRITISH COLUMBIA ($100)

The Society of Industrial and Cost Accountants of British Columbia will award a $100 scholarship to a student in the Accounting Option of the Business Management Technology. In alternate years this award is made by the Certified General Accountants' Association of British Columbia.

STANDARD OIL COMPANY OF BRITISH COLUMBIA LIMITED ($250)

Standard Oil Company of British Columbia Limited will award a $250 scholarship or bursary to a student in the Business Management Technology.

SUN-RYPE PRODUCTS LIMITED ($150)

The Sun-Rype Products Limited scholarship will be awarded to a student in the Food Technology.

TAHSIS COMPANY LTD. ($500)

Tahsis Company Ltd. will award two $250 scholarships—one to a student in the Forest Products Technology and one to a student in the Forestry Technology.

TELE-SIGNAL ELECTRONICS LTD. ($50)

This donation has been directed to a deserving student at the Institute of Technology, to be awarded at the discretion of the trustees of the Scholarship and Bursary Fund.

THOMPSON, BERWICK, PRATT & PARTNERS ($75)

This donation has been directed to a deserving student at the Institute of Technology, to be awarded at the discretion of the trustees of the Scholarship and Bursary Fund.

L. A. VARAH LIMITED ($100)

This donation has been directed to a deserving student at the Institute of Technology, to be awarded at the discretion of the trustees of the Scholarship and Bursary Fund.

VANCOUVER HOO HOO CLUB, No. 48 ($250)

The Vancouver Hoo Hoo Club, No. 48, will award a $250 bursary to a student in the Wood Option of the Forest Products Technology.

JACK WOODWARD MEMORIAL SCHOLARSHIP AND BURSARY FUND

The Jack Woodward Memorial Scholarship and Bursary Fund has been established to honour the memory of the late Head of the Chemical and Metallurgical Technology. The Fund is supported by an annual contribution of $200 from Eldorado Mining and Refining Limited.

WESTERN INTERNATIONAL HOTELS ($250)

Western International Hotels will award a $250 scholarship matched by a similar amount from the Georgia Hotel and the Bayshore Inn to students in the Hotel, Motel and Restaurant Management Technology.

WOODWARD STORES LTD. ($300)

Woodward Stores Ltd. will award a $150 scholarship or bursary to a student in the Business Management Technology, and a $150 scholarship or bursary to a student in either the Business Management Technology or Food Technology.

WRIGHT ENGINEERS LIMITED ($250)

Wright Engineers Limited will award a $250 scholarship or bursary to a student in the Mechanical Technology.

Business Management Course Enrichment Projects Fund

This Fund is available without restrictions to the Head of Business Management for special projects supplementary to the specified programme of studies. In the past, the Fund has underwritten the cost of entering a team in the International Inter-university Marketing Simulation Competition sponsored by Michigan State University and Sylvania Electric, the cost of special speakers, seminars, etc. Contributors to this Fund are:

Canadian Lead and Alloys Ltd.
Hudson's Bay Company.
Simpson-Sears Ltd.
Spider Looms Ltd.
W. M. Young, Esq.

Hudson's Bay Company Service Awards

These awards are available to first-year students proceeding to their second year in one of the Business Management Programmes. The award comprises payment of tuition fees and dues for the second year, summer employment, and part-time employment according to availability during the academic year. Applicants for these awards should have some interest in and aptitude for retailing, but no obligation of any kind devolves on a successful candidate. Applications are invited from first-year students in March of each year. Selections of recipients are from a list recommended by the Institute.

Academic Medals

Silver medals are awarded annually to the graduate who has achieved the highest academic standing in his programme of studies. The following medals were awarded at the 1968 Convocation Ceremonies. As indicated, most of the awards include a $100 prize.

Broadcast Communications—The British Columbia Association of Broadcasters' Award ($100).

Building — The Architectural Institute of British Columbia Award ($100).

Business Management:

Administrative Management—The Eaton Award ($100).

Data Processing—The British Columbia Telephone Company Award ($100).

Marketing—The Vancouver Sun Award ($100).

Financial Management—The Certified General Accountants' Association of British Columbia Award ($100).

Chemical and Metallurgical:

Industrial Chemistry—The Reichhold Chemicals (Canada) Ltd. Award ($100).

Physical Metallurgy—The Wire Rope Industries of Canada, Limited Award ($100).

Civil and Structural—The Col. W. G. Swan Award ($100).

Electrical and Electronics:

Electronics—The Lenkurt Electric Co. of Canada, Ltd. Award ($100).

Power — The Federal Pacific Electric of Canada Award ($100).

Food—The Food Executives Club Award ($100).

Forest Products:

Wood—The Council of the Forest Industries of British Columbia Award ($100).

Pulp and Paper—The British Columbia Institute of Technology Award ($100).

Forestry—The Council of the Forest Industries of British Columbia Award ($100).

Health:

Medical Laboratory—The Canadian Society of Laboratory Technologists, British Columbia Branch, Award ($100).

Medical Radiography—The British Columbia Radiological Society Award ($100).

Hotel, Motel and Restaurant Management—The British Columbia Hotels Association Award ($100).

Instrumentation—The Instrument Society of America, The J. J. Garey Memorial Award ($100).

Mechanical—The Canadian Manufacturers' Association Award ($100).

Mining—The British Columbia Section, Canadian Institute of Mining and Metallurgy Award ($100).

Natural Gas and Petroleum—The British Columbia Institute of Technology Award ($100).

Surveying—The David H. Burnett and Associates Award ($100).

Prizes

The following prizes were awarded at the 1968 Convocation Ceremonies to graduates who had gained the highest standing in specific subjects related to the pertinent industry or who had shown the greatest combination of academic ability and leadership to warrant unusual recognition.

Business Management

The Institute of Chartered Accountants of British Columbia awarded a prize of $25 to the student who had obtained the highest marks in Auditing 90.346 and 90.446.

The Society of Industrial and Cost Accountants of British Columbia awarded a prize of $25 to the student who had obtained the highest marks in Cost and Managerial Accounting 90.341 and 90.441.

The Certified General Accountants' Association of British Columbia awarded a prize of $25 to the student who had obtained the highest marks in Financial Accounting 90.347 and 90.447.

Civil and Structural

The British Columbia Association of Professional Engineers (Municipal Dvision) presented a prize to the graduate in Civil and Structural Technology who received the highest standing in Municipal Engineering.

FOREST PRODUCTS

The CANADIAN PULP AND PAPER ASSOCIATION (PACIFIC COAST BRANCH) awarded a prize of $250 to the outstanding graduate in the Pulp and Paper Option of the Forest Products Technology.

The VANCOUVER HOO HOO CLUB, NO. 48, awarded two prizes of $125 each to outstanding students in the Wood Option of the Forest Products Technology.

FORESTRY

The CANADIAN INSTITUTE OF FORESTRY prize was awarded to the outstanding graduate in the Forestry Technology.

HOTEL, MOTEL AND RESTAURANT MANAGEMENT

The STEPHEN EDWARDS award was presented to the student who obtained the highest mark in Hotel and Restaurant Accounting 92.313.

HEALTH

The WARNER-CHILCOTT award was made to the graduate in the Health Technology who had gained the highest general proficiency in his programme of studies.

The METROPOLITAN BIO-MEDICAL LABORATORIES LTD. awarded four prizes of $100 each to the best student in Bacteriology, Biochemistry, Hæmatology, and Radionuclides, Health Technology.

The ORTHO PHARMACEUTICAL (CANADA) LTD. prize was awarded to the outstanding graduate in the Medical Laboratory Programme who had gained the highest standing in hæmatology and immuno-hæmatology.

MECHANICAL

The INSTITUTION OF MECHANICAL ENGINEERS book prize was awarded to the graduate in the Mechanical Technology who had achieved the highest standing in Machine Design.

SURVEYING

The CORPORATION OF BRITISH COLUMBIA LAND SURVEYORS prize was awarded to the outstanding graduating student in the Surveying Technology.

Interim Prerequisites

During an interim period some senior secondary schools in British Columbia may not have completed the conversion to the revised curriculum.

For this interim period only, the Institute may consider as sufficient prerequisite the appropriate major science programme which has been offered at the school at which the applicant studied.

Schedule of Prerequisites, 1969

BUSINESS

A. GENERAL PREREQUISITE

Graduation from senior secondary school on the Academic-Technical Programme as prescribed by the Department of Education for the Province of British Columbia.

B. SPECIAL PREREQUISITES

Administrative Management.	*Nil.*
Financial Management.	*Nil.*
Marketing.	*Nil.*
Computer Programming and Systems:	
(*a*) Business Systems.	*Nil.*
(*b*) Computer Science.	Math. 12.
Technical Management.	Math. 12.
Broadcast Communications: Production.	Hist. 12; Eng. Lit. 12.
Hotel, Motel and Restaurant Management.	*Nil.*

ENGINEERING

A. GENERAL PREREQUISITE

Graduation from senior secondary school on the Academic-Technical Programme as prescribed by the Department of Education for the Province of British Columbia.

B. SPECIAL PREREQUISITES

Building.	Math. 12; Phys. 11.
Chemical and Metallurgical.	Math. 12; Chem. 11; Phys. 11.
Civil and Structural.	Math. 12; Phys. 11.
Electrical and Electronics.	Math. 12; Chem. 11; Phys. 11.
Food.	Math. 12; Chem. 11.
Forest Products.	Math. 12; Chem. 11.
Forestry.	Math. 12.
Instrumentation.	Math. 12; Phys. 11.
Mechanical.	Math. 12; Phys. 11.
Mining.	Math. 12; Chem. 11; Phys. 11.
Natural Gas and Petroleum.	Math. 12; Chem. 11; Phys. 11.
Surveying.	Math. 12; Phys. 11.

HEALTH

A. GENERAL PREREQUISITE

Graduation from senior secondary school on the Academic-Technical Programme as prescribed by the Department of Education for the Province of British Columbia.

B. SPECIAL PREREQUISITES

Biomedical Electronics.	Math. 12; Phys. 11; Chem. 11.
Medical Isotopes.	Math 12; two Science 11's.
Medical Laboratory.	Math. 12; Chem. 11; one other Science 11.
Medical Radiography.	Math 12; two Science 11's.
Nursing.	One Science 12.
Public Health.	Math 12; two Science 11's.

Commencing September, 1971, senior secondary counsellors and students are advised that B.C.I.T. Board of Admissions will be pleased to accept applicants who have graduated on the Academic-Technical Programme in any one of the three technical specialties and the Arts (Humanities) Specialty as indicated in the Administrative Bulletin for Secondary Schools (supplement to the 1967 edition), pages 14 and 15.

Expansion
Programme

The programme of building expansion at the British Columbia Institute of Techology is continuing. As the student body grows in numbers, the buildings ad services to accommodate them have been provided.

During 1968 the main development has been the construction of the Library, Audio-Visual, and Bookstore Building. This imposing structure on the campus will be completed by the end of 1968. Two floors of the building are already occupied by the Library. Reports have indicated that up to 2,000 students a day are using this fine new facility. The Library serves the British Columbia Institute of Technology, British Columbia Vocational School, and teachers' training students on the campus.

An extension to the Boilerhouse-Mechanical Building was completed in the spring of 1968. This extension has provided additional space for the Mechanical, Surveying, Forestry, and Chemical and Metallurgical Technologies.

The playing-field and the running-track surrounding it were completed this year. The playing-field has not yet been used by the students as they prefer to wait until the turf on the playing-field is fully matured. However, the running-track is being used with good effect by both students and staff in an effort to keep fit.

In 1968 the working drawings for the multi-purpose building on the campus were completed. The multi-purpose building contains the student cafeteria, student offices, the health clinic, gymnasium facilities, and an auditorium. The planning was done in two parts: one part contains the students services, and the other the gymnasium and auditorium. It is possible it will be built in two parts: the section containing the student services first, and then to be followed by the gymnasium and auditorium. In the meantime the Government is erecting a large Butler building which will serve temporarily as a gymnasium for students to use until the multi-purpose building is completed.

A start has been made to an extension of the Food Service Building on the campus. This addition will provide much-needed laboratory space for the Hotel, Motel and Restaurant Management Programme and for the food laboratories for the British Columbia Vocational School.

Planning is going forward for the erection of two student residences on the campus to take care of the growing number of students who come from out of town and require living accommodations. A request also has been made for a bank to serve the students and staff on the campus. Included in the banking premises will be a store and barber-shop.

From an initial registration in 1964 of approximately 500 students, the registration rose in the fall of 1968 to more than 2,400 full-time day-school students and 2,400 evening students. Further growth is expected in the future as new training options are added and increased numbers of students are registered in the existing technologies.

List of Programmes

BUSINESS MANAGEMENT

- Administrative Management
- Broadcast Communication.
- Computer Programming and Systems
- Financial Management
- Hotel, Motel and Restaurant Management
- Marketing
- Technical Management

ENGINEERING

- Building
- Chemical and Metallurgical
- Civil and Structural
- Electrical and Electronics
- Food
- Forest Products
- Forestry
- Instrumentation
- Mechanical
- Mining
- Natural Gas and Petroleum
- Surveying

HEALTH

- Biomedical Electronics
- Medical Isotopes
- Medical Laboratory
- Medical Radiography
- Nursing
- Public Health

Business Management

The accelerated development in recent years of scientific knowledge and industrial productivity has increased the complexity of modern business. This has stimulated competition to a very high degree, and in order to maintain its ability to compete, management has had to rely on a more scientific approach to managing. Specialists in many fields are employed to gather, analyse, interpret, and present information for management's use. With the increasingly specialized nature of modern business, young persons about to enter business must not only be eager, intelligent, and hard working, but must have specialized training as well. The curriculum of the Business Management technology embraces the technical nature of management practices, and consequently graduates from this programme are in high demand by prospective employers. Students will follow a prescribed course in one of the following programmes.

Administrative Management Programme

Students taking the Administrative Management Programme will concentrate their studies in the growing and dynamic aspects of modern administrative management services to be found in large and formally organized enterprises, small businesses, and government. Job opportunities lead to a wide selection of administrative management activities, with emphasis on getting things done through people.

Computer Programming and Systems Programme

The development of the computer in the last 10 years has provided the technical means which have made many of the present sophisticated techniques of management feasible. This field is probably the fastest-growing area in business, and students graduating in this option will be proficient in the design of systems using modern business machines and electronic computers. They will find many challenging and rewarding opportunities as operators, programmers, or systems analysts.

Financial Management Programme

The increasing complexity of modern business management is demonstrated nowhere more clearly than in the field of financial management. The recording and reporting of financial information are constantly being improved and up-dated. The use of financial data in making predictions and decisions has been revolutionized by the computer and the application of new techniques such as discounted cash flow. It is to train graduates in this growing and important field that the financial management programme has been designed.

Marketing Programme

The revolution in marketing calls for new emphasis in training to take advantage of the many satisfying job opportunities in buying, merchandising, industrial sales, advertising, and sales promotion. These occupations present as great a challenge to ambition and rewards for accomplishment as almost any other field of endeavour.

Technical Management Programme

Industrial technology is progressing even more rapidly and has created a demand for the man trained in both management methods and the basic engineering principles. Graduates of this programme are expected to find initial employment in industrial engineering or methods offices, technical sales or purchasing, cost analysis or estimating. These careers should lead toward a position in management.

Business Management

Administrative Management Programme

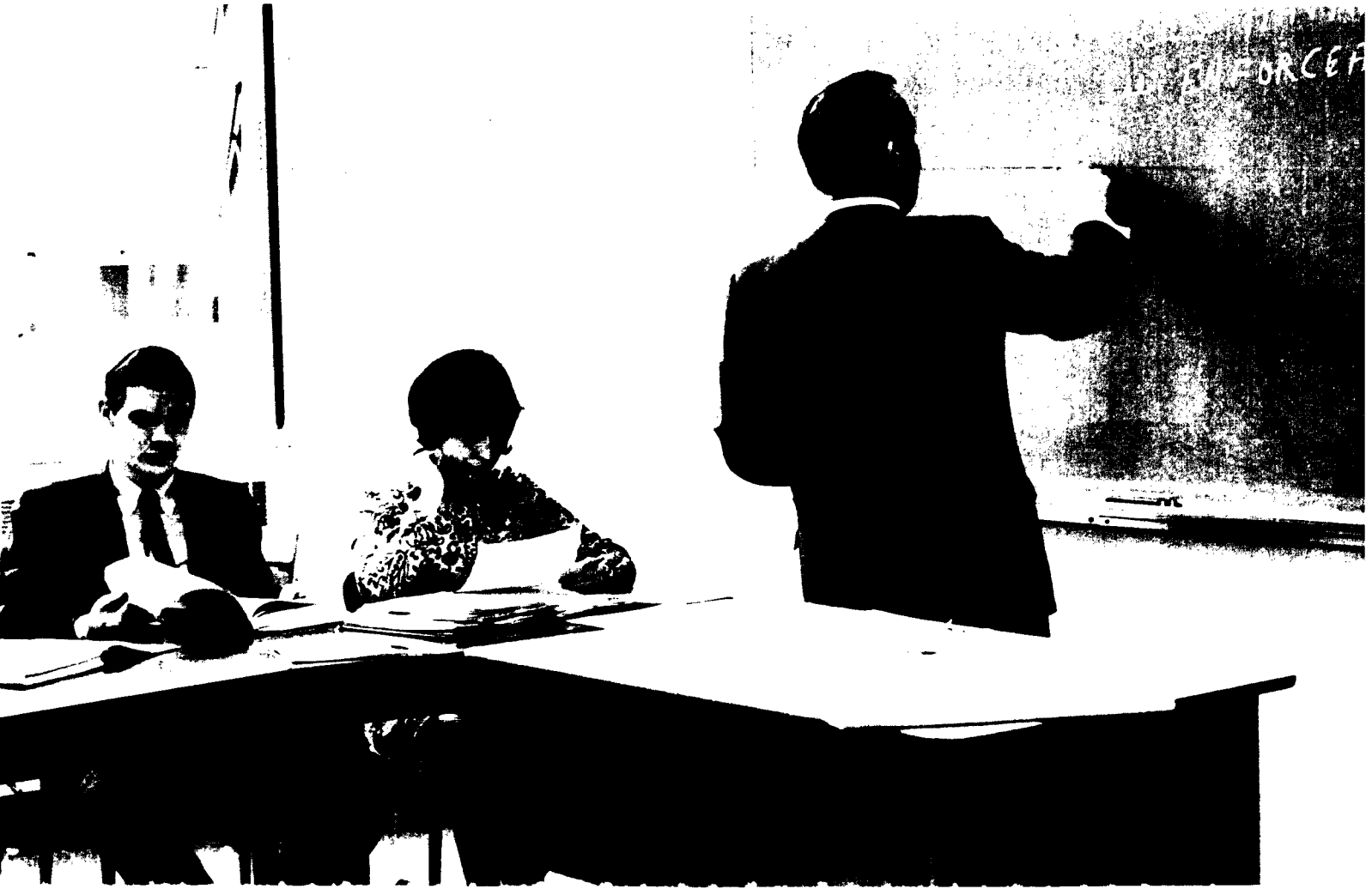
The Administrative Management Programme is designed to give the student a broad yet thorough understanding of modern business practices, and to fit him for efficient administrative performance. This programme provides the necessary background for young men and women who wish to enter positions in a wide range of businesses, industry, or government.

Following the basic subjects given in the earlier terms, the student will study a variety of interrelated subjects in the field of business. Course material covering the framework of the various subjects is supplemented by laboratory work designed to simulate actual business problem situations. Business case discussions, problem sessions, seminars, and field trips give the student full opportunity to take an active part in analysing problems, drawing conclusions from the data provided, making proposals, and suggesting solutions much as would be the case in actual situations. In this way the student gains confidence in his ability to participate in handling the many varied problems of business, and develops a competence and adaptability in those administrative techniques so necessary for the successful manager.

To the student taking this programme, opportunities are available in a choice of fields, including public utilities, governmental agencies, transportation, real estate, manufacturing, financial institutions, and a range of large and small businesses.

Administrative positions in these fields would involve such functions as planning, research, finance, business organization, personnel administration, and industrial relations. After appropriate job experience, opportunities would be at the intermediate level, such as office manager, department or branch manager.

Upon graduation, competent individuals with initiative who have an inquiring mind, diversified interests, a desire to see things done efficiently, and who enjoy working with people could find themselves launched on a rewarding career leading to important executive positions.



BUSINESS MANAGEMENT

ADMINISTRATIVE MANAGEMENT PROGRAMME

YEAR 1 — *Term 1*

No.	Subject	Hours per Week Lec.	Lab.
31.102	Business Writing and Contemporary Thought	2	1
90.103	Business Mathematics and Statistics	2	3
90.131	Management in Industry	1	2
90.135	Economics	2	2
90.140	Accounting	2	3
90.150	Introduction to Data Processing	2	2
90.170	Marketing	2	1
90.182	Office Equipment	1	2
	Common Tutorial	----	1
	Library and Research	----	4
		14	21

Term 2

31.202	Business Writing and Contemporary Thought	2	1
90.203	Business Mathematics and Statistics	2	3
90.221	Psychology	2	1
90.232	Administrative Practices	1	3
90.235	Economics	2	2
90.240	Accounting	2	3
90.270	Marketing	2	1
90.296	Office Systems and Procedures	1	2
	Common Tutorial	----	1
	Library and Research	----	4
		14	21

YEAR 2 — *Term 3*

		ADMINISTRATION OPTION Hours per Week Lec.	Lab.	MANPOWER MGT. OPTION Hours per Week Lec.	Lab.
90.391	Work Study	1	2	1	2
90.322	Human Relations	2	1	2	1
90.333	Industrial Processes	1	2	1	2
90.360	Business Law	2	1	2	1
90.361	Finance	2	2	2	2
90.352	Data Processing Applications	2	3	2	3
90.332	Estate Management	2	1	----	----
90.381	Communication Systems	1	1	----	----
90.325	Industrial Relations	2	3	2	3
90.321	Psychology	----	----	2	1
	Library and Research	----	4	----	6
		15	20	14	21

Term 4

90.424	Personnel Administration	2	3	2	3
90.434	Managerial Policy	1	2	1	2
90.360	Business Law	2	1	2	1
90.461	Finance	2	2	2	2
90.491	Work Study	1	3	1	3
90.432	Estate Management	2	1	----	----
90.443	Management Accounting	2	3	----	----
90.481	Transportation	2	1	----	----
90.425	Industrial Relations	----	----	2	3
90.427	Manpower Selection and Placement	----	----	2	3
	Library and Research	----	5	----	6
		14	21	12	23

General Prerequisite: Graduation on the Academic-Technical Programme.

Broadcast Communications

The need for educational facilities in broadcast communications has long been recognized by the industry in Canada.

The broadcasters of this Province lend their whole-hearted support to this concept; moreover, an industry committee was deeply involved in the formulation of the Broadcast Communications programme.

With new radio and television stations coming on the air every year, with the expansion of present station activities, and the increasing activity in such areas as educational television, the demand for trained personnel continues. To give training with a strong emphasis on the practical aspects, a complete radio and television laboratory was established at the Institute. The Broadcast Communications programme is a realistic one, offering authentic on-the-job training and experience within the Institute, with students working in actual radio and television production for an entire school-year before they go into industry.

Students receive training in all non-electronic areas of broadcasting in both radio and television, taking a common first year, and then receiving specialized tuition in one of three electives in second year—Radio, Television, and News. In addition to instruction in announcing, writing, news operations, recording, and radio and television production, students are given a thorough knowledge of the use and operation of all broadcasting equipment.

To be successful, students in Broadcast Communications must possess a real interest for this demanding field. Although personality requirements vary somewhat, the out-going person is better suited to those positions in which meeting the public is of great importance. Shift work is common in the industry, since both radio and television stations operate most of the day and night.

A thorough knowledge of English is essential to the prospective student in this programme, as is a genuine interest in the world and its peoples. Previous study in the areas of history and current events is of value.

To graduates, the broadcasting industry offers interesting, challenging, and rewarding work with ample opportunities for advancement.

Those prospective students whose interest lies in the electronic areas of the broadcasting industry, such as the maintenance and repair of the equipment used in broadcasting, are directed to the Electrical and Electronics programme of the Institute, and to the Broadcast Systems elective in the Electronics Option of this programme.

7
6
5

BROADCAST COMMUNICATIONS

YEAR 1 — *Term 1*

No.	Subject	Hours per Week Lec.	Lab.
31.103	Writing and Modern Literature	2	1
90.105	Statistics in Broadcasting	2	1
90.135	Economics	2	2
90.230	Business	2	1
91.101	Elementary Broadcast Technology	3	----
91.103	Writing and Sales	1	2
91.109	Introduction to News	2	----
91.110	Broadcast Production	3	7
	Library and Research	----	4
		17	18

Term 2

31.203	Writing and Modern Literature	2	1
90.205	Statistics in Broadcasting	2	1
90.235	Economics	2	2
90.260	Basic Law for Broadcasting	2	----
91.201	Elementary Broadcast Technology	3	----
91.203	Writing and Sales	1	2
91.209	Introduction to News	2	2
91.210	Broadcast Production	3	6
	Library and Research	----	4
		17	18

YEAR 2 — *Term 3*

31.303	Writing and the Mass Media	2	1
91.303	Writing and Sales	1	2
91.305	History and Current Events	2	2
	Elective*	4	16
	Library and Research	----	5
		9	26

* Students will select one of the following three electives:

91.302 Production—Radio.
91.309 News—Radio and Television.
91.312 Production—Television.

Term 4

31.403	Writing and the Mass Media	2	1
91.403	Writing and Sales	1	2
91.405	History and Current Events	2	2
	Elective*	4	16
	Library and Research	----	5
		9	26

* Students will continue on the elective selected in Term 3:

91.402 Production—Radio.
91.409 News—Radio and Television.
91.412 Production—Television.

N.B.—All students will serve a four-week industry practicum in Term 4.
General Prerequisite: Graduation on the Academic-Technical Programme.
Special Prerequisites: History 12, English Literature 12.

Business Management

Computer Programming and Systems Programme

The development, in the last few years, of the electronic computer has resulted in what has been called a "second industrial revolution." Almost every field of human endeavour has been affected by this development, and computers are now used in such diversified areas as banking, libraries, business accounting, air-line ticket reservations, space flight, controlling railroads, predicting weather, calculating statistics for insurance companies, scientific research, and automatic control of factories, refineries, and power plants.

These applications of the electronic computer cannot be successfully established without an enormous amount of human planning and preparation. The computer is an extremely fast and reliable calculating device, but it must be given completely detailed instructions for every step in the calculation. This involves three main steps in the application of a computer to a problem. First, a complete analysis must be made of the problem, taking into account every conceivable situation that can arise. Second, an approach to the solution must be formulated showing the action to be taken in each different circumstance. Finally, the solution must be expressed in the form of a set of instructions to the computer.

These three steps comprise the work of the systems analyst and computer programmer, and the growth in the use of electronic computers has been so rapid and so extensive that there is a severe shortage of such personnel throughout the entire world.

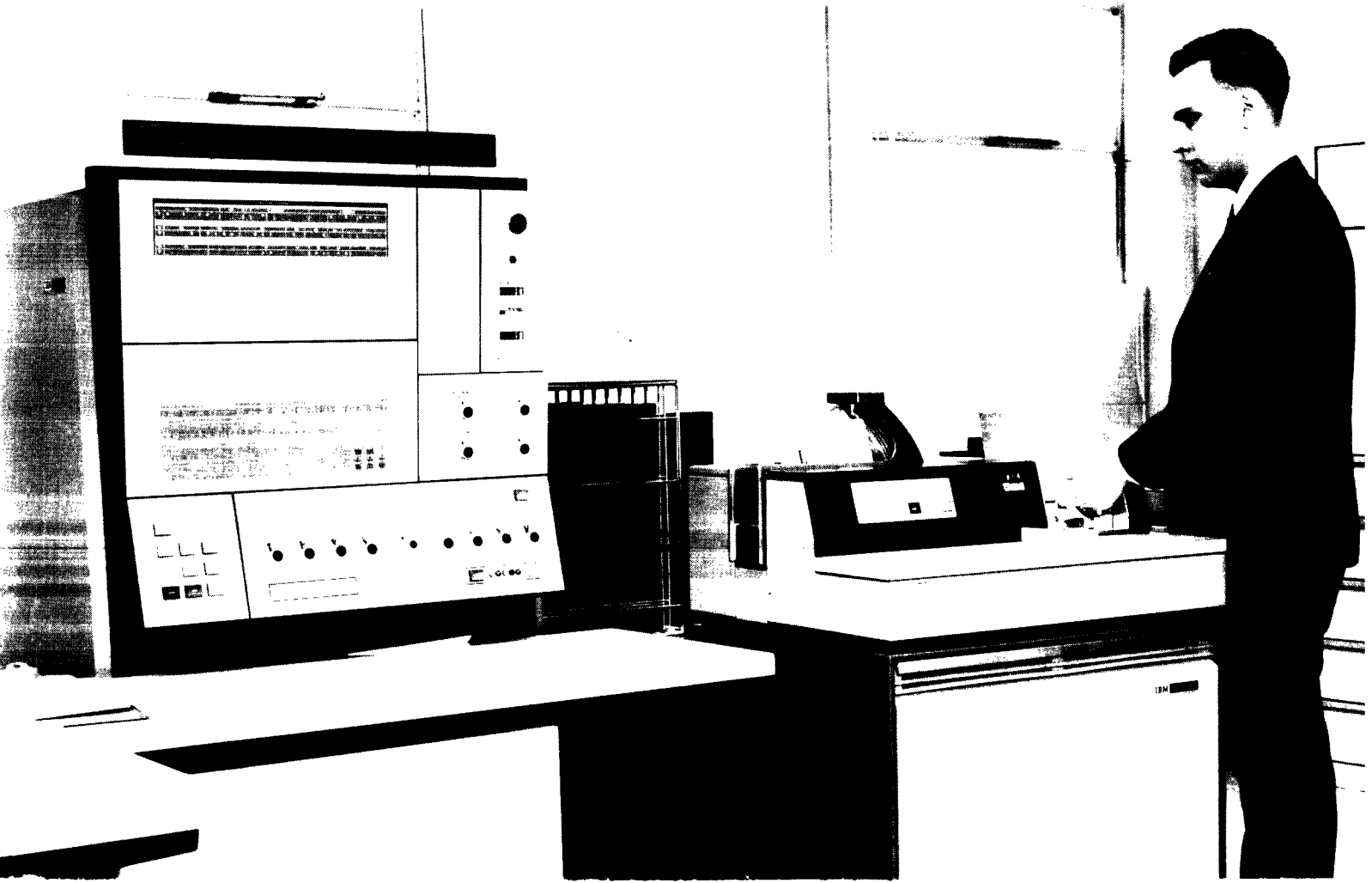
Current estimates indicate that the number of people directly involved with electronic computers in British Columbia will almost double between 1968 and 1971.

The Computer Programming and Systems Programme is designed to train students to meet this demand for programmers and systems analysts. In the first year, basic business subjects such as accounting, economics, office equipment, etc., are studied, as well as the introductory courses in programming and systems. In the second year, students have the choice of concentrating either on business data-processing systems or on the more technical areas of mathematical, process-control, and data-communication programming.

Students wishing to enter this programme should have an analytical mind with a strong aptitude for logical reasoning, as well as a capacity for painstaking attention to detail.

Those interested in the Computing Science Option in the second year must also have an outstanding ability in mathematics and a keen interest in the physical sciences.

A graduate of this programme, with these qualities, is assured of employment in one of the most exciting and rapidly growing areas of modern technology.



BUSINESS MANAGEMENT

COMPUTER PROGRAMMING AND SYSTEMS PROGRAMME

YEAR 1 — *Term 1*

No.	Subject	Hours per Week Lec.	Lab.
31.102	Business Writing and Contemporary Thought	2	1
90.104	Mathematics	2	3
90.135	Economics	2	2
90.140	Accounting	2	3
90.152	Unit Record Data Processing	1	1
90.160	Introduction to Computer Programming	2	2
90.171	Marketing	2	2
90.182	Office Equipment	1	2
	Common Tutorial	....	1
	Library and Research	....	4
		14	21

Term 2

31.202	Business Writing and Contemporary Thought	2	1
90.204	Statistics in Business	1	2
90.235	Economics	2	2
90.240	Accounting	2	3
90.250	Computer Programming Principles	2	4
90.252	Computer Systems I	3	2
90.296	Office Systems and Procedures	1	2
	Common Tutorial	....	1
	Library and Research	....	5
		13	22

YEAR 2 — *Term 3*

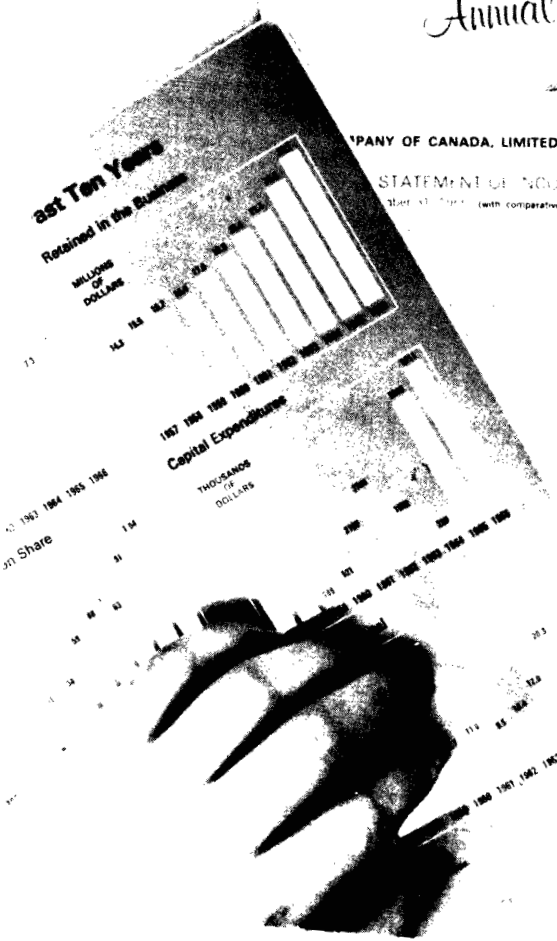
		Business Systems Hours per Week		Computing Science Hours per Week	
No.	Subject	Lec.	Lab.	Lec.	Lab.
31.302	Business Communications	....	1	....	1
90.322	Human Relations	2	1	2	1
90.350	360 Assembler Programming	2	6	2	6
90.396	Computer Systems II	2	3	2	3
90.391	Work Study	1	2	....	....
90.304	Quantitative Methods for Management	1	2	....	....
90.341	Cost and Managerial Accounting	2	3	....	....
90.305	Calculus with Business and Technical Applications	....	....	2	4
90.306	Probability and Mathematical Statistics	....	....	2	2
48.350	Instrumentation	....	....	....	3
	Library and Research	....	7	....	5
		10	25	10	25

Term 4

31.402	Business Communications	....	1	....	1
90.450	360 Assembler and Operating Systems	2	6	2	6
90.496	Computer Systems III	2	4	2	4
90.404	Quantitative Methods for Management	1	2	....	....
90.434	Managerial Policy	1	2	....	....
90.441	Cost and Managerial Accounting	2	3	....	....
90.491	Work Study	1	3	....	....
90.497	Engineering Application Programmes	....	....	1	1
43.433	Digital Techniques	....	....	2	2
90.407	Numerical Methods and Fortran Programming	....	....	1	2
90.408	Linear Algebra and Applications	....	....	1	2
90.409	Introduction to Operations Research	....	....	1	2
	Library and Research	....	5	....	5
		9	26	10	25

General Prerequisite: Graduation on the Academic-Technical Programme.
Special Prerequisite for Computer Science: Mathematics 12.

Annual Report 1966



'PANY OF CANADA, LIMITED and Subsidiary Companies

STATEMENT OF INCOME AND RETAINED EARNINGS

[illegible] (with comparative figures for the year 1965)

	1966	1965
	$504,762,987	$516,405,960
	2,462,170	1,416,334
	$507,225,157	$517,822,294
	$398,165,780	$404,978,217
	29,499,952	27,593,809
	3,764,448	988,835
	5,977,067	3,854,563
	27,074,000	25,958,000
	$464,481,247	$473,418,424
	$ 42,743,910	$ 44,403,870
	2,403,789	260,478,996
	47,699	$303,932,866
		$ 1,011,180
		19,310,945
		1,206,952
	194	$ 21,529,077
	$304,629,505	$282,403,789

CONSOLIDATED BALANCE SHEET December 31, 1966

(with comparative figures at December 31, 1965)

	1966	1965
ASSETS		
CURRENT ASSETS		
Cash	$ 9,601,319	$ 7,576,205
Marketable securities at cost (approximates quoted market value)	25,968,006	37,939,107
Accounts receivable	69,341,211	74,766,499
Inventories at the lower of cost or market (Note 6)	114,176,797	121,112,044
Prepaid expenses	1,458,674	1,075,151
	$220,546,007	$242,469,006
SPECIAL REFUNDABLE TAX	$ 3,327,524	—
INVESTMENTS IN ASSOCIATED COMPANIES at cost (Note 7)	$ 20,002,709	$ [illegible]
FIXED ASSETS		
Plants and properties at cost	$846,692,975	$780,801,179
Less Accumulated depreciation	382,380,139	[illegible]
	$464,312,836	$396,289,741
TOTAL ASSETS	$708,189,076	$657,771,649
CURRENT LIABILITIES		
Accounts payable and accrued	$ 58,135,910	
Provision for income and other taxes	3,404,012	
Dividend and extra distribution payable	6,034,762	
Current portion of long term debt	14,411,00	
	$ 81,985,6	
LONG TERM DEBT (Note 2)	59,726	
PROVISION FOR DEFERRED INCOME TAXES	133,7	
TOTAL LIABILITIES	$275,4	
[illegible]		
COMMON SHARES — no par value (Note 9)		
Authorized — 28,000,000 shares		
Issued — 24,139,052 shares	$128,098,886	
RETAINED EARNINGS — in use in the business	304,629,505	
TOTAL SHAREHOLDERS' EQUITY	$432,728,391	
TOTAL LIABILITIES AND SHAREHOLDERS' EQUITY	$708,189,076	$65

Approved on behalf of the Board: W. SCOTT [illegible] Director — H. M. GRIFFITH, Q.C. Director

Business Management

Financial Management Programme

Financial management is a vital aspect of business life and continues to grow in importance as modern management techniques are developed and applied. The Financial Management Programme will enable students to train in this field by taking a general course of studies in their first year followed by specialized training in either Accounting or Finance.

Accounting Option

Accounting, which has frequently been called the "language of business," can be broken down into three parts—accounting systems, financial reporting, and auditing. The Accounting Option is concerned with all three aspects of accounting. They are introduced in the first-year courses in accounting, data processing, and systems. More specialization is provided in financial and cost accounting in the second year.

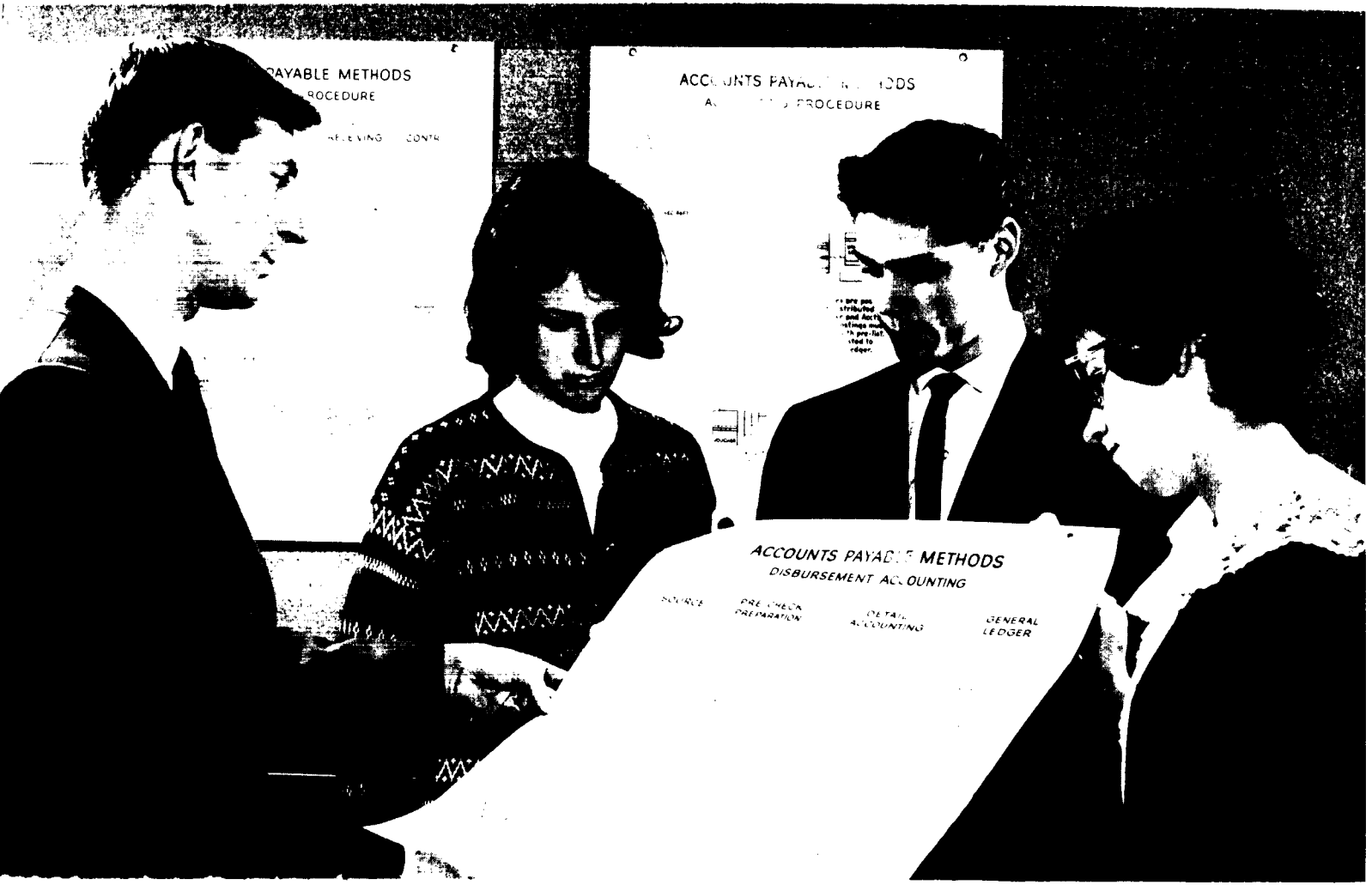
Large organizations maintain departments to perform the accounting functions of financial accounting, cost accounting, internal audit, and budget preparation. Many jobs are open in these departments at the middle management level. That the graduate can enter accounting positions upon leaving the British Columbia Institute of Technology does not mean that his training should be considered at an end. The faculty of the option maintain active and close liaison with the professional accounting associations in British Columbia, and the graduate who wants to undertake the training they offer is in an advantageous position as a result of the courses he has taken at the Institute.

Finance Option

Finance is an essential part of business management. No undertaking can begin or continue unless it has financing. Finance is the concern of business firms as they seek funds for existing and new operations. Finance is the concern of financial institutions, as they provide funds for the business firms. Background for the study of finance is provided in the financial accounting courses. Decision-making in the finance field is dealt with in depth in the specialized second-year courses.

Many job opportunities exist for graduates in this option. Financial institutions such as banks, trust companies, insurance companies, and finance companies offer a wide range of occupations. These institutions are increasingly aware of the need for post-high-school training. Business firms also offer opportunities in their finance departments for option graduates. After appropriate job experience, opportunity for advancement to the intermediate level of branch manager and beyond would exist.

A student wishing to enter either the Accounting Option or the Finance Option should have an inquiring mind and enjoy working with people. A capacity to reason clearly and to work hard is also required. A student who comes with these qualities and a determination to succeed will be assured of employment in a field of absorbing interest and continuing challenge.


ACCOUNTS PAYABLE METHODS
DISBURSEMENT ACCOUNTING
SOURCE
PRE-CHECK PREPARATION
DETAIL ACCOUNTING
GENERAL LEDGER

BUSINESS MANAGEMENT

FINANCIAL MANAGEMENT PROGRAMME

YEAR 1 — *Term 1*

No.	Subject	Hours per Week Lec.	Lab.
31.102	Business Writing and Contemporary Thought	2	1
90.103	Business Mathematics and Statistics	2	3
90.131	Management in Industry	1	2
90.135	Economics	2	2
90.140	Accounting	2	3
90.150	Introduction to Data Processing	2	2
90.170	Marketing	2	1
90.182	Office Equipment	1	2
	Common Tutorial	---	1
	Library and Research	---	4
		14	21

Term 2

31.202	Business Writing and Contemporary Thought	2	1
90.203	Business Mathematics and Statistics	2	3
90.232	Administrative Practices	1	2
90.235	Economics	2	2
90.240	Accounting	2	3
90.245	Credit and Collections	2	1
90.270	Marketing	2	1
90.296	Office Systems and Procedures	1	2
	Common Tutorial	---	1
	Library and Research	---	5
		14	21

YEAR 2 — *Term 3*

No.	Subject	ACCOUNTING OPTION Hours per Week Lec.	Lab.	FINANCE OPTION Hours per Week Lec.	Lab.
90.390	Work Study	1	2	1	2
90.322	Human Relations	2	1	2	1
90.332	Estate Management	---	---	2	1
90.341	Cost and Managerial Accounting	2	3	---	---
90.346	Auditing	2	1	---	---
90.347	Financial Accounting	2	3	2	3
90.352	Data Processing Applications	2	3	---	---
90.360	Business Law	2	1	2	1
90.361	Finance	2	2	2	2
90.364	Financial Intermediaries	---	---	2	2
90.365	Money and Banking	---	---	2	2
	Library and Research	---	4	---	6
		15	20	15	20

Term 4

90.424	Personnel Administration	2	1	2	1
90.432	Estate Management	---	---	2	1
90.434	Managerial Policy	1	2	1	2
90.441	Cost and Managerial Accounting	2	3	---	---
90.446	Auditing	2	1	---	---
90.447	Financial Accounting	2	3	2	3
90.452	Business Computer Programming	2	2	---	---
90.460	Business Law	2	1	2	1
90.461	Finance	2	2	2	2
90.465	Money and Banking	---	---	2	2
90.466	Security Analysis	---	---	2	2
	Library and Research	---	5	---	6
		15	20	15	20

General Prerequisite: Graduation on the Academic-Technical Programme.

Hotel, Motel and Restaurant Management

The "hospitality" industry is in a state of rapid expansion. In 1968 receipts from tourists to Canada rose to approximately $1 billion, almost double the amount of five years ago. This rate of growth is expected to continue. Every hotel, motel, and restaurant must be staffed by trained managers and employees to serve the tourist trade and travelling public. At present the demand for qualified administrative personnel exceeds the supply, a situation likely to become even more serious in the next few years. The need is for well-trained managers with the ability to look ahead and plan—with the flexibility of mind to adapt to rapidly changing conditions. This is the challenge!

In the two-year programme, students obtain intensive theoretical and practical training not only in general business procedures, but also in every aspect of hotel or restaurant operations: front office and housekeeping; general and departmental controls and accounting; purchasing, receiving, and storing of hotel supplies; preparation and serving of food and beverages; maintenance and engineering; planning and design; advertising and promotion; and human relations. The hotel and restaurant laboratory area at the Institute is outfitted with fully furnished typical hotel and motel rooms, a lobby and lounge, and a front desk equipped with the latest automatic billing and audit machine. Students will train in the school's cafeteria and dining-room, learning the fundamentals of food operations from the purchase of food through its preparation to the serving of a top-quality meal.

With this training, supplemented by three months of added practical experience in a hotel, motel, or restaurant between the first and second years, graduates should find ample employment opportunities. Although it is unlikely that a graduate will step immediately into a top position, after some experience at the front desk or in the general office he should, within a few years, assume such positions as front office manager, catering manager, or assistant manager of a smaller hotel. Female graduates could expect to assume executive housekeeping or food management positions. Eventual promotion to full managership is up to the individual. Many other opportunities lie in the fields of industrial and air-line catering, and in other businesses associated with the problems of mass feeding and housing, such as hospitals and universities.

Graduates should be prepared to work irregular hours if necessary and be able to associate harmoniously with fellow employees and the public in general. The personal touch is imperative; in the service industries, machines can lighten the load, but they cannot replace a personality.

HOTEL, MOTEL AND RESTAURANT MANAGEMENT

YEAR 1 — *Term 1*

No.	Subject	Hours per Week Lec.	Lab.
31.102	Business Writing and Contemporary Thought	2	1
90.103	Business Mathematics and Statistics	2	3
90.135	Economics	2	2
90.140	Accounting	2	3
90.245	Credit and Collection	2	2
92.101	Front Office Management	2	2
92.102	Food and Beverage Management	3	2
	Tutorial	....	1
	Library and Research	....	4
		15	20

Term 2

31.202	Business Writing and Contemporary Thought	2	1
90.150	Introduction to Data Processing	1	2
90.203	Business Mathematics and Statistics	2	3
90.235	Economics	2	2
90.240	Accounting	2	3
92.202	Food and Beverage Management	3	2
92.203	Bar and Rooms Management	2	1
92.211	English Speech	....	2
	Tutorial	....	1
	Library and Research	....	4
		14	21

HOTEL, MOTEL OPTION

YEAR 2 — *Term 3*

31.302	Business Communication	....	1
90.390	Work Study	1	2
92.302	Food and Beverage Management	3	6
92.312	Engineering and Maintenance	2	....
92.313	Hotel Accounting	2	2
92.314	Planning and Design	2	2
92.315	Advertising and Promotion	1	2
92.316	Human Relations	1	1
92.317	Hotel Law	2	....
	Library and Research	....	5
		14	21

Term 4

31.402	Business Communication	....	1
92.402	Food and Beverage Management	3	6
92.412	Engineering and Maintenance	2	....
92.413	Hotel Accounting	2	2
92.414	Planning and Design	2	2
92.415	Advertising and Promotion	1	2
92.416	Human Relations	1	1
92.417	Hotel Law	2	....
92.418	French Conversation	....	3
	Library and Research	....	5
		13	22

FOOD MANAGEMENT OPTION

YEAR 2 — *Term 3*

31.302	Business Communication	....	1
90.390	Work Study	1	2
92.302	Food and Beverage Management	3	12
92.316	Human Relations	1	1
92.320	Food and Beverage Control	1	2
92.321	Food Marketing	1	2
92.323	Food Science and Sanitation	2	1
	Library and Research	....	5
		9	26

Term 4

31.402	Business Communication	....	1
92.402	Food and Beverage Management	3	12
92.416	Human Relations	1	1
92.420	Food and Beverage Control	1	2
92.422	Menu Planning	1	....
92.423	Food Science and Sanitation	2	1
92.424	Food Facilities Design	1	2
92.425	Restaurant Law	2	....
	Library and Research	....	5
		11	24

General Prerequisite: Graduation on the Academic-Technical Programme.


PYJAMAS

Marketing Programme

The stature of marketing within our society continues to grow.

The tremendous growth of our productive capacity, made possible by the accelerating rate of technological innovation, demands dynamic marketing practices, intense cultivation of markets, and intelligent, resourceful, trained marketing people to carry out the varied marketing functions.

These marketing people must be equipped with an understanding of the objectives, concepts, principles, methods, and problems of marketing. Thus they should have an aptitude and flair for responding to the challenges of a dynamic society where wants and needs are continually changing.

In order to meet this need, the Institute makes extensive use of the most modern methods of instruction, provides for guests from industry to lecture in their respective fields of specialization, and requires active participation of the student in business settings, through field trips, group projects, seminars, and case studies.

As a consequence of growth both in enrolments and career opportunities, provision has been made for additional specialization within the marketing field. The objective of this change is to bring the student closer to the point where he can make an effective contribution to society in his career.

Two options are available in the Marketing Programme. Following a common first year, students may elect either the Marketing Management Option or the Retail Marketing Option.

The former prepares students for careers in sales and sales management, advertising and sales promotion, and marketing research.

The latter is a preparation for a career in retailing.

Both options lead to careers in fields where the rewards for accomplishment are prompt and substantial.

BUSINESS MANAGEMENT

MARKETING PROGRAMME

YEAR 1

Term 1

No.	Subject	Hours per Week Lec.	Lab.
31.102	Business Writing and Contemporary Thought	2	1
90.103	Business Mathematics and Statistics	2	3
90.131	Management in Industry	1	2
90.135	Economics	2	2
90.140	Accounting	2	3
90.150	Introduction to Data Processing	2	2
90.170	Marketing	2	1
90.182	Office Systems and Equipment	1	2
	Library and Research	....	5
		14	21

Term 2

31.202	Business Writing and Contemporary Thought	2	1
90.203	Business Mathematics and Statistics	2	3
90.235	Economics	2	2
90.240	Accounting	2	3
90.270	Marketing	2	1
90.296	Systems and Procedures	1	2
90.245	Credit and Collections	2	1
90.275	Salesmanship	2	1
	Library and Research	....	4
		16	19

YEAR 2

Term 3

No.	Subject	Retail Marketing Option Hours per Week Lec.	Lab.	Marketing Management Option Hours per Week Lec.	Lab.
90.322	Human Relations	2	1	2	1
90.360	Business Law	2	1	2	1
90.373	Advertising and Sales Promotion	2	3	2	3
90.374	Marketing Research—Theory	2	1	2	1
90.342	Retail Merchandise Accounting	2	2	....	....
90.384	Retailing	2	2	....	....
90.385	Fashion and Æsthetics	2	3	....	....
90.383	Wholesaling*	....	....	2	1
90.386	Exports and Imports	....	....	2	2
90.387	Market Planning	....	....	2	3
90.389	Consumer Behaviour	2	2	2	2
	Library and Research	....	4	....	5
		16	19	16	19

Term 4

90.424	Personnel Administration	2	2	2	2
90.460	Business Law	2	1	2	1
90.473	Advertising and Sales Promotion	2	3	2	3
90.474	Marketing Research—Applied	1	3	1	3
90.434	Managerial Policy	1	2	1	2
90.488	Transportation and Materials Handling	2	1	2†	1
90.442	Retail Merchandise Accounting	2	2	....	....
90.472	Merchandising	2	3	....	....
90.443	Management Accounting	....	....	2	3
90.476	Sales Management	....	....	2	1
	Library and Research	....	4	....	5
		14	21	14	21

* Alternate elective: 90.332 Estate Management.
† Alternate elective: 90.432 Estate Management.

General Prerequisite: Graduation on the Academic-Technical Programme.

Technical Management Programme

Modern industry has created a demand for a new kind of technologist. He is the man who combines a mathematical and scientific interest in solving industrial problems. He needs a sound knowledge of both business operations and engineering fundamentals and procedures. The training he receives will lead him to a career in problem-solving as a methods analyst in plant or office, or possibly into a position as technician in an industrial engineering office.

Graduates of this programme whose interests centre on the communication of ideas, rather than the creation of solutions, will find this training to be a solid foundation for a career in technical sales or purchasing. Others, whose interests relate to the control of business, may proceed into careers in cost analysis or estimating.

The job opportunities in these areas are expanding rapidly because modern business is becoming more and more technical. With more money being spent in research than ever before, products are being developed which require businessmen to extend their technical knowledge in order to produce, market, purchase, and use them. This development, coupled with increased competition, requires that more and more attention be given to operating cost and methods. In many cases, products are produced which must be profitable from their introduction to the market because they become technically obsolete within a few years.

The person who wishes to work and progress in this environment requires specific attributes. He must have good ability and interest in the applications of mathematics, coupled with the potential to communicate effectively in English. He must be mature and able to share ideas with a wide range of people. A sense of curiosity toward mechanical and electrical devices is beneficial especially if associated with the talent to put this to use. In general, he must have the ability to acquire a higher education and have a desire to use the tools of the technologist in a modern business environment.

To provide students with the basic tools, this programme provides subjects in both business and the basic engineering technologies. These subjects will provide training to enable the student to operate at a practitioner level and will consequently stress applications. Some subjects will, of course, emphasize theoretical knowledge (e.g., mathematics), which will be necessary in order to understand some of the more advanced topics.

Trips will be arranged to demonstrate the application of various techniques in industry. This will be complemented by guest lecturers who have special knowledge in particular areas. These approaches ensure that the programme remains oriented toward industrial practice. Students graduating from this programme will have a sound base from which to progress toward a management career.

BUSINESS MANAGEMENT

TECHNICAL MANAGEMENT PROGRAMME

YEAR 1 *Term 1*

No.	Subject	Hours per Week Lec.	Lab.
31.101	Writing in a Technical Context	2	1
33.102	Introductory Physics	3	2
49.101	Draughting	---	2
49.106	Applied Mechanics A	2	3*
90.104	Mathematics	2	3
90.110	Problems Laboratory	1	3*
90.140	Accounting	2	3
90.150	Introduction to Data Processing	2	2
	Common Tutorial	---	1
	Library and Research	---	4
		14	21

Term 2

31.201	Writing in a Technical Context	2	1
33.202	Introductory Physics	3	2
49.206	Engineering Concepts	2	2
49.267	Introduction to Machine Tools	1	3
90.204	Statistics in Business	1	2
90.210	Applied Programming	1	3
90.240	Accounting	2	3
	Common Tutorial	---	1
	Library and Research	---	6
		12	23

YEAR 2 *Term 3*

90.135	Economics	2	2
90.304	Quantitative Methods for Management	1	2
90.314	Work Measurement	2	3
90.315	Method Study	2	3
90.316	Systems and Procedures Analysis	2	1
90.322	Human Relations	2	1
90.343	Cost Accounting	2	3
	Library and Research	---	7
		13	22

Term 4

90.235	Economics	2	2
90.404	Quantitative Methods for Management	1	2
90.410	Business Engineering Problems	3	5
90.412	Industrial Organization and Operation	4	4
90.417	Materials Handling and Control Equipment	1	1
90.424	Personnel Administration	2	1
	Library and Research	---	7
		13	22

* Three hours alternating each week.

General Prerequisite: Graduation on the Academic-Technical Programme.
Special Prerequisite: Mathematics 12.

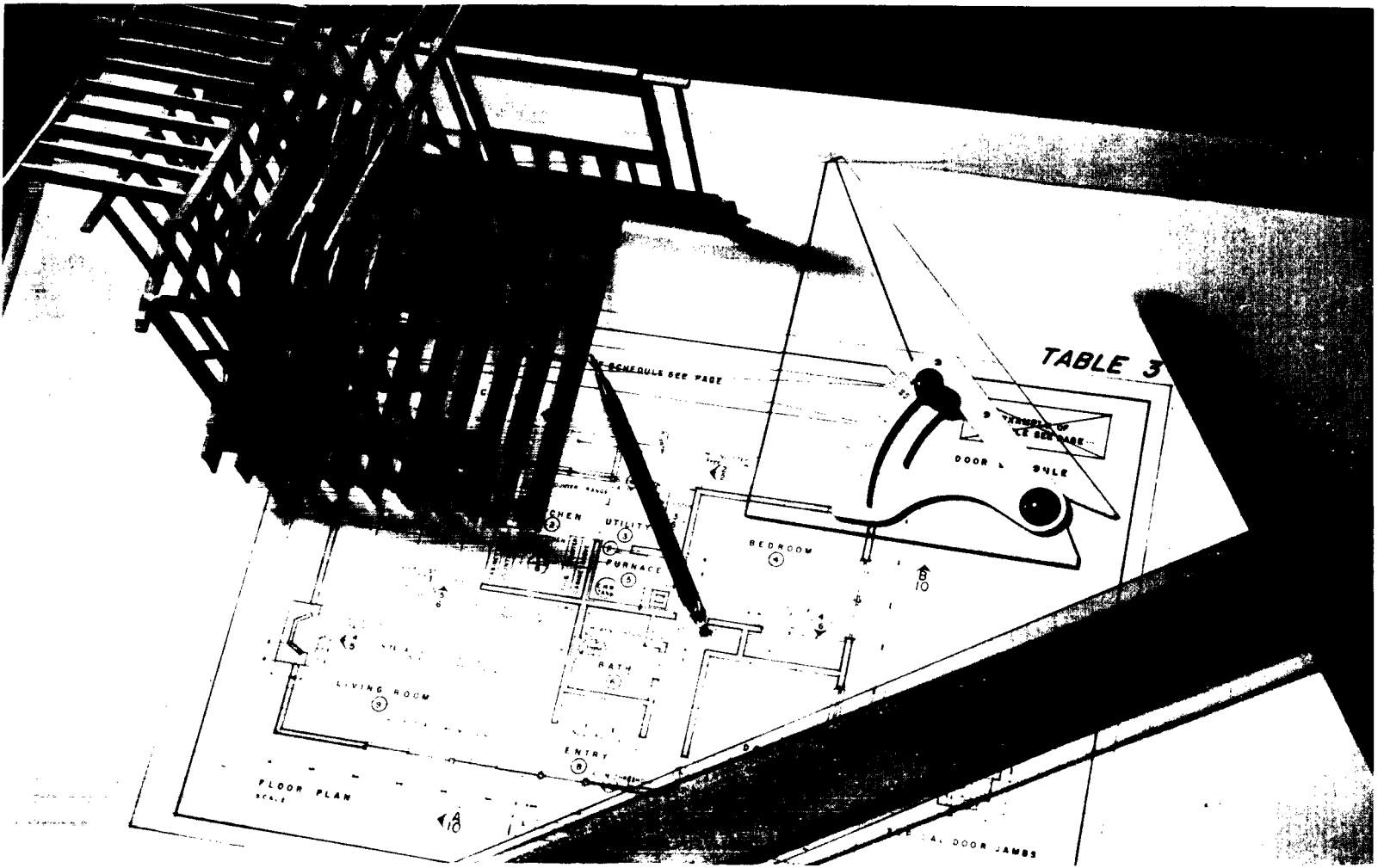


TABLE 3
SCHEDULE SEE PAGE
DOOR SCHEDULE
BEDROOM
FURNACE
BATH
LIVING ROOM
ENTRY
FLOOR PLAN
DOOR JAMBS

Building Technology

Throughout the world, rapidly expanding populations have enormously increased the demand for building operations of all kinds, and the course in Building Technology is designed to give as sound a preparation for their work as time allows.

In addition to continuing such basic high-school subjects as physics, mathematics, and English, which are essential in acquiring any degree of technical proficiency, the course introduces students in the first year to various specialized subjects as listed. All these subjects contain both lecture and draughting-room instruction, so students find they can further their education through their summer employment, being capable of working as draughtsmen in architects' and engineers' offices, as well as in the offices of various sub-trade and general contracting organizations.

In the second year, students continue with the specialized subjects listed above, but in addition begin a thorough coverage of such subjects as materials of construction, specification writing, quantity and cost estimating, work study, and similar subjects which further expand the number of possible areas into which they may move successfully on graduation.

Fundamentally, graduate technologists will understand buildings three-dimensionally, with all their architectural, structural, and mechanical implications, and with this as a point of departure may enter any area of the building, or related, field to which their individual interests and qualifications lead them.

We envisage graduates, after a suitable period of practical experience, becoming chief draughtsmen in a variety of offices; specification writers; estimators with architectural, engineering, contracting, or other offices; building inspectors; officials in property management departments; appraisers and assessors in private and governmental offices; expediters, senior clerks, office managers in contractors' offices; superintendents of construction; partners in construction organizations, particularly sub-trades; agents for building supplies and equipment; technicians in private or governmental building laboratories; teachers and instructors in public schools and universities, to name the more obvious possibilities.

The environmental services option in second year enables students so inclined to specialize in building services in place of building structures.

In general, the course is creating a supply of highly qualified "assistant administrators" who will fill positions in the building world which lie between the professional architect, engineer, and contractor on the one hand and the vocationally trained draughtsman and tradesman on the other.

To students who wish to become registered architects by the apprenticeship system, the Royal Architectural Institute of Canada offers graduates credit for about half the examinations otherwise required.

BUILDING TECHNOLOGY

YEAR 1 — *Term 1*

No.	Subject	Hours per Week Lec.	Lab.
31.101	Writing in a Technical Context	2	1
32.101	Mathematics	2	2
33.104	Physics for Building Technology	3	0
40.101	Design and Draughting	1	4
40.102	Building Construction	4	4
40.103	Building Services	1	2
40.104	Building Regulations	1	...
40.107	Building Structures	2	2
	Library and Research	...	4
		16	19

Term 2

31.201	Writing in a Technical Context	2	1
32.226	Mathematics	2	2
33.204	Physics for Building Technology	3	0
40.201	Design and Draughting	1	4
40.202	Building Construction	2	4
40.203	Building Services	1	2
51.204	Surveying	1	2
40.207	Building Structures	2	2
	Library and Research	...	4
		14	21

YEAR 2 — *Term 3*

No.	Subject	Hours per Week Lec.	Lab.	ENVIRONMENTAL SERVICES OPTION Hours per Week Lec.	Lab.
40.301	Design	1	3	1	3
40.302	Building Construction	2	5	2	5
40.303	Building Services	2	2	2	2
40.305	Construction Specifications and Estimating	5	1	5	1
40.307	Building Structures	1	3	...	...
40.308	Environmental Services	...	...	1	3
90.230	Business	2	1	2	1
	Tutorials	...	3	...	3
	Library and Research	...	4	...	4
		13	22	13	22

Term 4

40.401	Design	1	3	1	3
40.402	Building Construction	2	5	2	5
40.403	Building Services	3	2	3	2
40.405	Construction Specifications and Estimating	5	1	5	1
40.407	Building Structures	1	3	...	...
40.408	Environmental Services	...	...	1	3
90.390	Work Study	1	1	1	1
	Tutorials	...	3	...	3
	Library and Research	...	4	...	4
		13	22	13	22

Course Prerequisite: Graduation in the Academic-Technical Programme.
Special Prerequisites: Mathematics 12, Physics 11.

Chemical and Metallurgical Technology

The programme in Chemical and Metallurgical Technology provides instruction to those men and women wishing to enter the process industries—either in the laboratory, in the production department, in the engineering department, or in the technical sales department. As the technology encompasses a broad range of industries and sciences, the training emphasizes mathematics, physics, and chemistry, and their application to general problems recurring in the chemical process industries, rather than to specific problems peculiar to a single industry. Consequently, the first year is general, but a *Unit Processes* course and a workshop course are unique to this programme.

In the second year the curriculum provides considerable analytical laboratory practice together with such production and engineering training as work study, unit operations, and instrumentation. In addition, the student is given the option of taking one subject in advanced organic chemistry, in physical metallurgy, or in extractive metallurgy.

In this way a graduate will be equipped to enter the industry of his choice in either the sales, production, engineering, or laboratory department.

Typical of the chemical process industries that will engage graduates from the programme are oil refineries, chlorine and caustic soda producers, beet and cane sugar refiners, cement producers, lime and gypsum producers, plastic and resin producers; copper, lead, zinc, and other metal smelters; aluminum, iron and steel, magnesium, and bronze smelters; metal fabricators and heat treaters; pulp and paper mills, and cellulose chemical producers; and mining companies engaged in both exploration and production. Typical of the positions graduates would seek upon entering industry would be as chemists and analysts in research, commercial, and industrial laboratories, as engineering assistants in engineering departments of industrial and consulting companies, as production supervisor trainees in production plants, or as technical sales trainees in the sales departments of chemical process industries or equipment manufacturers.

CHEMICAL AND METALLURGICAL TECHNOLOGY

YEAR 1 — *Term 1*

No.	Subject	Hours per Week Lec.	Lab.
31.101	Writing in a Technical Context	2	1
32.101	Mathematics	3	2
33.101	General Physics (A1)	3	3
41.103	Engineering Materials	2	3*
30.101	General Chemistry	3	3
49.101	Draughting	---	2
41.102	Laboratory Workshop	---	3
90.230	Business	2	1
	Library and Research	---	4/1*
		15	20

Term 2

31.201	Writing in a Technical Context	2	1
32.223	Mathematics	3	2
33.201	General Physics (A2)	3	3
30.201	General Chemistry	3	3
30.304	Chemical Laboratory Techniques	---	3
41.203	Engineering Materials	2	3*
41.207	Unit Processes	1	2*
49.201	Draughting	---	2
	Library and Research	---	4/5*
		14	21

* Alternate weeks.

INDUSTRIAL CHEMISTRY OPTION

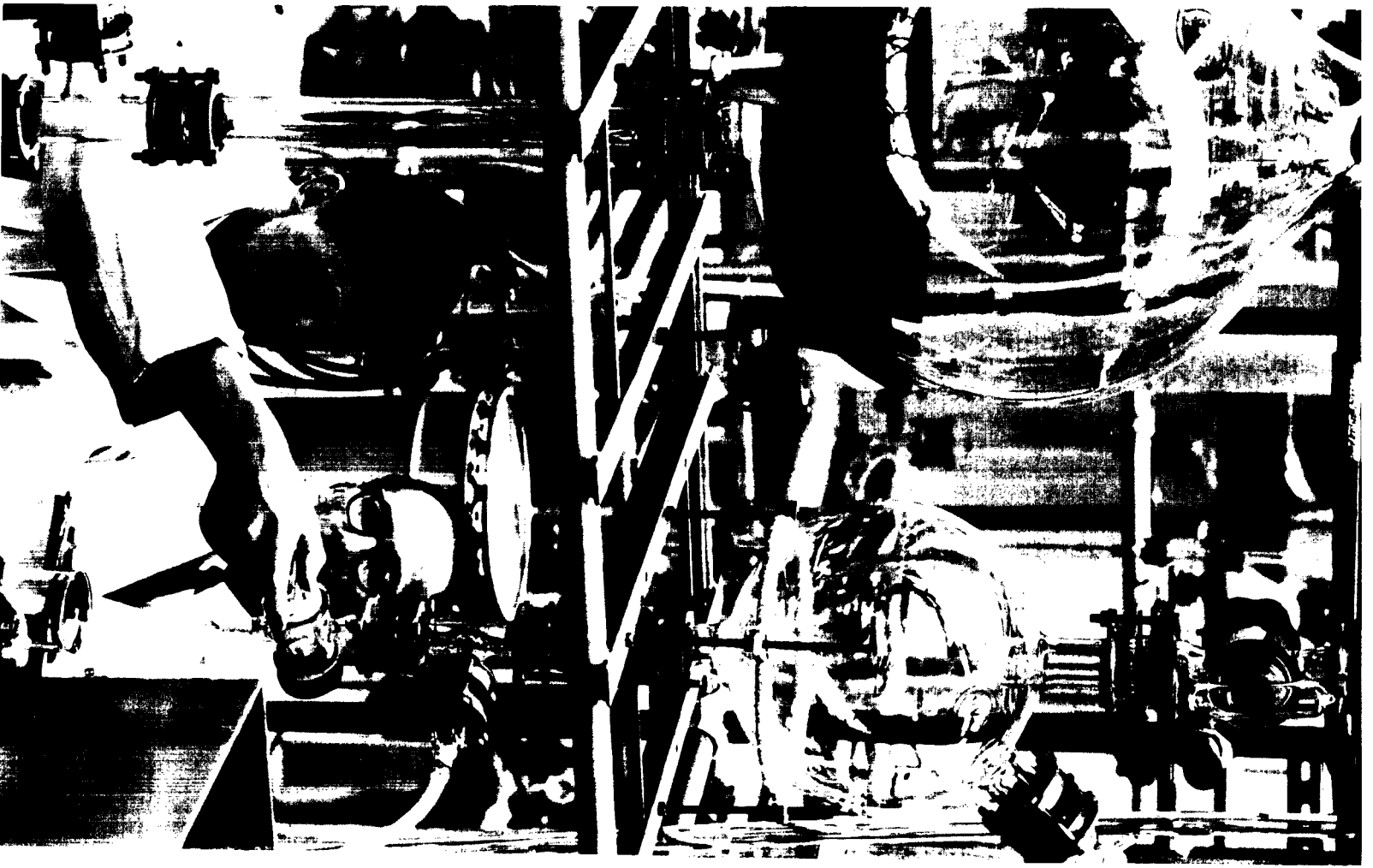
YEAR 2 — *Term 3*

No.	Subject	Hours per Week Lec.	Lab.
31.301	Writing in a Technical Context	1	1
32.306	Mathematics	3	2
30.301	Organic Chemistry	2	4
30.302	Physical Chemistry	2	3
41.303	Analytical Chemistry	2	4
47.341	Unit Operations	3	3
	Library and Research	---	2
		13	22

Term 4

31.401	Writing in a Technical Context	1	1
32.445	Mathematics	3	2
41.403	Analytical Chemistry	2	4
30.401	Organic Chemistry	2	4
48.450	Instrumentation	---	3
47.441	Unit Operations	3	3
90.390	Work Study	2	---
	Library and Research	---	5
		13	22

General Prerequisite: Graduation on the Academic-Technical Programme.
Special Prerequisites: Mathematics 12; Chemistry 11; Physics 11.



PHYSICAL METALLURGY OPTION

YEAR 2 — *Term 3*

No.	Subject	Hours per Week Lec.	Lab.
31.301	Writing in a Technical Context	1	1
32.306	Mathematics	3	2
30.302	Physical Chemistry	2	3
41.303	Analytical Chemistry	2	4
41.304	Physical Metallurgy	2	4
47.341	Unit Operations	3	3
	Library and Research	....	5
		13	22

Term 4

31.401	Writing in a Technical Context	1	1
32.445	Mathematics	3	2
41.403	Analytical Chemistry	2	4
41.404	Physical Metallurgy	2	4
48.450	Instrumentation	....	3
47.441	Unit Operations	3	3
90.390	Work Study	2	....
	Library and Research	....	5
		13	22

EXTRACTIVE METALLURGY OPTION

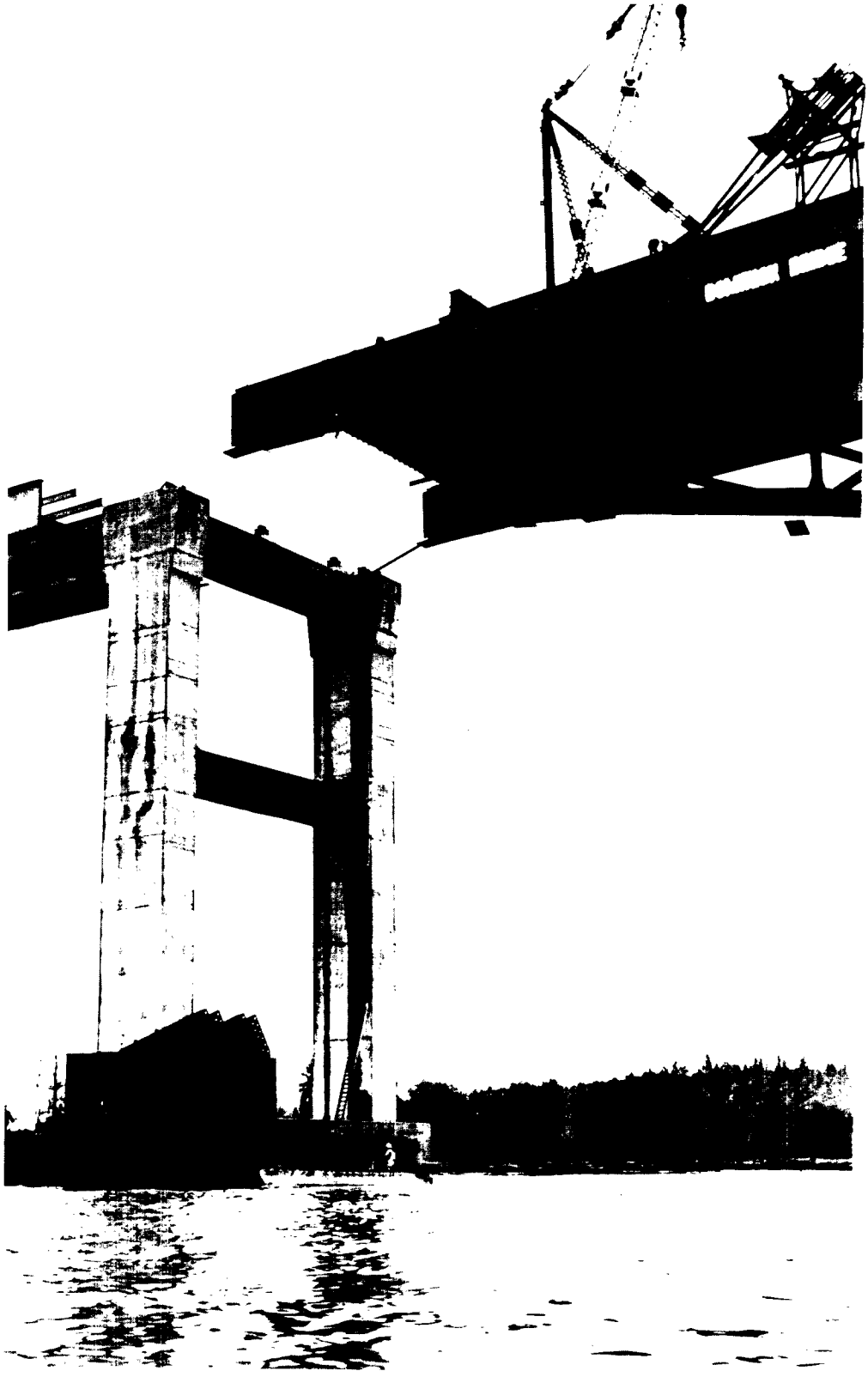
YEAR 2 — *Term 3*

No.	Subject	Hours per Week Lec.	Lab.
31.301	Writing in a Technical Context	1	1
32.306	Mathematics	3	2
41.307	Extractive Metallurgy	3	3
30.302	Physical Chemistry	2	3
41.303	Analytical Chemistry	2	4
47.341	Unit Operations	3	3
	Library and Research	....	5
		14	21

Term 4

31.401	Writing in a Technical Context	1	1
32.445	Mathematics	3	2
41.407	Extractive Metallurgy	3	3
41.408	Assaying	....	3
41.403	Analytical Chemistry	2	4
48.450	Instrumentation	....	3
47.441	Unit Operations	3	3
	Library and Research	....	4
		12	23

General Prerequisite: Graduation on the Academic-Technical Programme.
Special Prerequisites: Mathematics 12; Chemistry 11; Physics 11.



Civil and Structural Technology

Civil and Structural Technology, which creates the physical facilities for the civilized environment, is concerned with the design and construction of bridges, highways, railways, airports, dams, power developments, canals, docks, harbours, and buildings of all kinds, as well as drainage, irrigation, sewage, and water-supply systems.

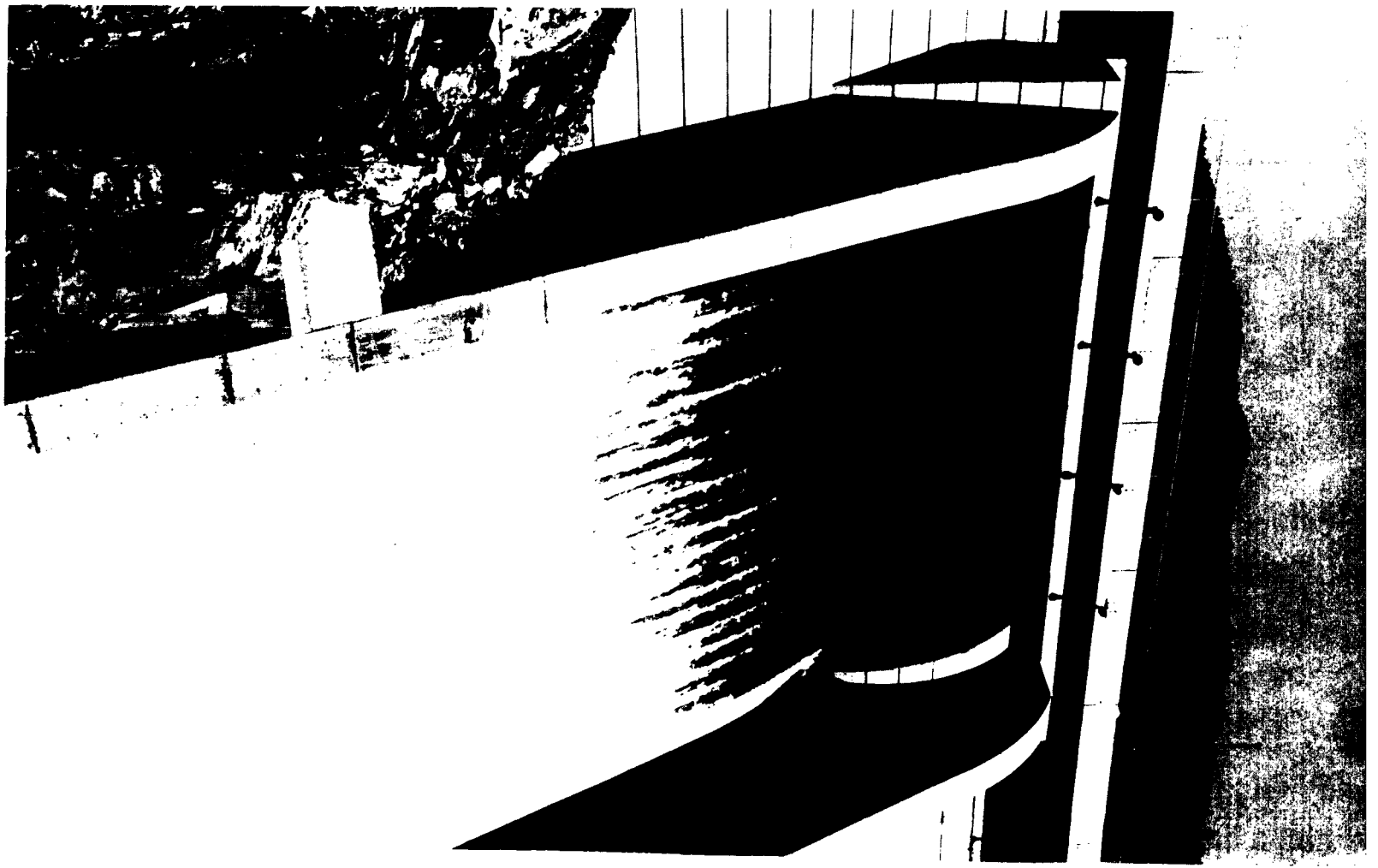
In Canada, and particularly in British Columbia, with the economy developing rapidly, a great demand exists for trained technicians. Specifically designed to train civil and structural technicians, this programme will provide a man with sufficient specialized knowledge to make him immediately capable of playing a useful role in the economy. In addition, the programme prepares him to adapt to demands of the future.

The programme provides a foundation in mathematics and the applied sciences for continued technical growth, and in English for the ability to set forth, in clear and precise language, descriptions and analyses of projects and engineering activities. The methods of instruction are planned to develop the initiative of the student while training him in habits of accurate analysis and careful work. In addition, frequent field trips will be made to appropriate projects to demonstrate at first hand the technology in operation. A student is encouraged to secure summer work which will give him an insight into various aspects of the career upon which he is about to enter.

A graduate may be employed as an inspector or supervisor in the contracting field, as an investigating or laboratory technician, or as a design or field technician in a consultant's office. He may be employed by municipal, provincial, or federal agencies, by consulting engineers, architects, and contractors, or in technical sales.

Candidates must have a sound knowledge of mathematics, physics, and English, and preferably some training in draughting. An interest in the practical application of scientific principles is essential.

This field frequently involves both indoor and outdoor assignments and requires keenness to take up the challenge offered by a fast-expanding industry demanding initiative and responsibility from its employees.



CIVIL AND STRUCTURAL TECHNOLOGY

YEAR 1 — *Term 1*

No.	Subject	Hours per Week Lec.	Lab.
31.101	Writing in a Technical Context	2	1
32.101	Mathematics	3	2
33.107	General Physics (C1)	3	2
49.101	Draughting		2
51.102	Surveying		3
42.101	Civil Engineering and Tutorials	4	8
	Library and Research		5
		12	23

Term 2

31.201	Writing in a Technical Context	2	1
32.223	Mathematics	3	2
33.207	General Physics (C2)	3	2
49.201	Draughting		2
51.202	Surveying		3
42.201	Civil Engineering and Tutorials	4	8
	Library and Research		5
		12	23

YEAR 2 — *Term 3*

31.301	Writing in a Technical Context	1	1
32.304	Mathematics	2	2
51.309	Surveying		3
42.301	Civil Engineering and Tutorials	7	11
Electives		1	2
	90.391 Work Study (Civil and Traffic).		
	90.390 Work Study (Structural).		
Library and Research			5
		11	24

Term 4

31.401	Writing in a Technical Context	1	1
32.456	Mathematics	2	3
51.409	Surveying		3
Electives		6	14
	42.401 Civil Engineering (Civil) and Tutorials.		
	42.402 Civil Engineering (Traffic) and Tutorials.		
	42.403 Civil Engineering (Structural) and Tutorials.		
Library and Research			5
		9	26

General Prerequisite: Graduation on the Academic-Technical Programme.

Special Prerequisites: Mathematics 12 plus any three of Physics 11, 12 and Chemistry 11, 12.

BCIT

Electrical and Electronics Technology

The electrical and electronics industry, vital to every aspect of Canadian life, continues to grow rapidly. It provides power needed by industry (the use of electrical energy in Canada doubles every 10 years), supplies facilities for the ever-increasing requirements of communications, and serves the needs of automation, transportation, defence, and our personal comforts. New products and methods are continually being developed to meet new demands. Consequently there is a continuing and increasing need for men and women well trained in the principles and practical application of electricity and electronics to apply their talents and assume positions of importance in an ever-expanding and interesting field.

The objective of the two-year Electrical and Electronics Technology programme is to provide sufficient training for the graduate to enter industry at the para-professional level as an engineering assistant or technologist. A broad training is given in fundamentals and industrial practices, qualifying the graduate to enter a variety of fields in an industry which provides many opportunities.

Two options are offered—Electronics and Electrical Power. Both options have a common first year (Terms 1 and 2), during which special emphasis is placed on electrical and electronic principles, with essential support subject-matter being provided by a series of service courses. In the second year (Terms 3 and 4) specialized training is given to the student in the option of his choice, Term 4 being applications oriented; for example, the Industrial System Design Course relates the previously learned principles to the industrial environment the student will encounter upon graduation.

Throughout the entire two-year period the student will spend approximately one-half of his time in the up-to-date laboratories, confirming the results of theoretical studies and carrying out personal investigations.

Graduates from the Electrical and Electronics Technology are employed in research and development, system design, production, sales, installation, and maintenance in both commercial companies and government agencies.

For other programmes in Electronics *see* " Biomedical Electronics."

ELECTRICAL AND ELECTRONICS TECHNOLOGY

YEAR 1

Term 1

No.	Subject	Hours per Week Lec.	Lab.
31.101	Writing in a Technical Context	2	1
32.170	Mathematics	5	4
33.106	General Physics (B1)	3	2
43.101	Electrical and Electronic Components		2
43.102	Electrical Circuits	5	4
49.101	*Draughting*		2
	Library and Research		5
		15	20

Term 2

31.201	Writing in a Technical Context	2	1
32.270	Mathematics	5	4
33.206	General Physics (B2)	3	2
41.208	Properties of Materials		2
43.202	Electrical Circuits	3	3
43.205	Electronic Circuits	2	2
49.201	Draughting		2
	Library and Research		4
		15	20

YEAR 2

Term 3

		POWER OPTION Hours per Week		ELECTRONICS OPTION Hours per Week	
No.	Subject	Lec.	Lab.	Lec.	Lab.
31.301	Writing in a Technical Context	1	1	1	1
32.370	Mathematics	3	2	3	2
43.303	Digital Techniques	3	2	3	2
43.311	Electrical Equipment	3	3		
43.312	Electrical Circuits	3	3		
43.314	Industrial Electronics	3	3		
43.320	Measurements			2	2
43.325	Electronic Circuits			3	4
43.326	Communications			3	4
	Tutorial		2		2
	Library and Research		3		3
		16	19	15	20

Term 4

43.411	Electrical Equipment	3	3		
43.412	Circuit Analysis	2	2		
43.414	Automatic Control Systems	3	3		
43.418	Industrial System Design	2	3		
43.419	*Utility Systems*	3	4		
43.421	Electrical Systems			2	3
43.425	Pulse Circuits			2	3
43.427	Microwave			2	2
43.428	Electronic Elective*			4	4
43.429	Supervisory and Control Systems			3	3
90.230	*Business*	1	1	1	1
	Library and Research		5		5
		14	21	14	21

* In 43.428, students take *one* of the following: (*a*) Telecommunications Systems; (*b*) Digital Computer Systems; (*c*) Circuit Design and Development; (*d*) Broadcasting Systems.

General Prerequsite: Graduation on the Academic-Technical Programme.

Special Prerequtsites: Mathematics 12; Chemistry 11; Physics 11.

For other programmes in Electronics *see* "Biomedical Electronics."

Food Technology

Our abundance of food, more nutritious, appetizing, and convenient today than ever before, can be attributed in large part to technological progress. The application of scientific methods is rapidly changing both the production of raw food materials and the processing of finished food products. As a result, skilled personnel, including technicians, are required to oversee and control the complex operations of our modern food industry. The Food Technology programme, consisting of two options, Food Production and Food Processing, is designed to provide these trained technicians.

The Food Production Option provides for a thorough grounding in the basic sciences which lead to more specialized courses in Crop, Animal, and Soil Technologies and, in addition, offers a sound training in the analytical, mechanical, and business aspects of modern agricultural production.

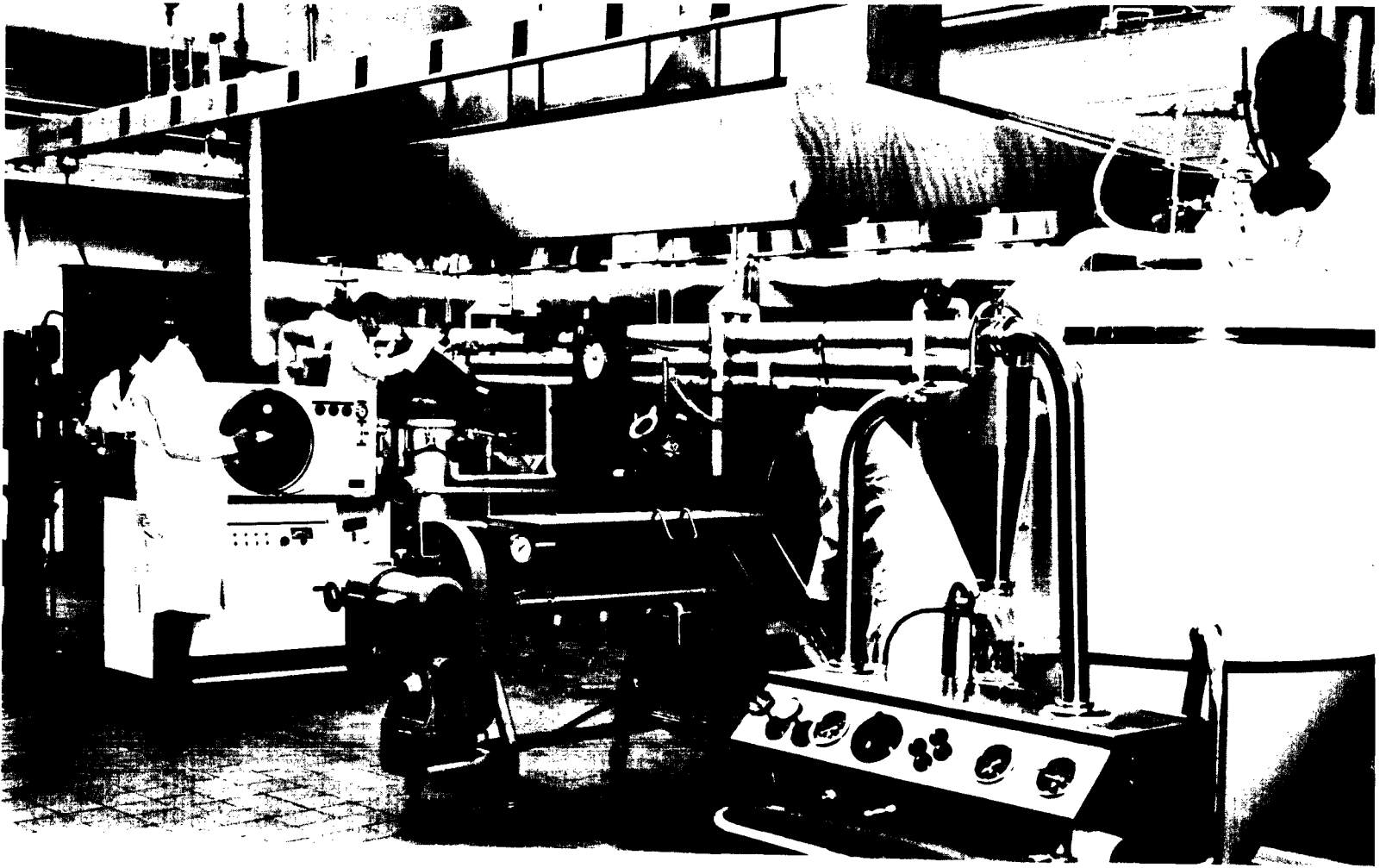
In the laboratory, the student will learn to apply knowledge of specialities such as genetics, nutrition, pathology, chemistry, microbiology, statistics, and business, to the improvement of man's food supply from plant and animal sources. Laboratory sessions will be supplemented with field trips to observe actual agricultural operations.

The graduate in the Food Production Option will have many employment avenues open to him, each leading to a worth-while career opportunity; for example, trained technicians are required for the laboratory control and marketing of agricultural chemicals, feeds, and fertilizers, and also in the field operations of food-manufacturing concerns. Additional job opportunities exist in inspection services and in government and industry research operations. There are almost limitless opportunities for rewarding careers in this basic and important sector of our nation's economy.

The Food Processing Option is planned, first, to provide a sound knowledge of the basic sciences and, second, to proceed to more advanced technical courses in quality-control methods, food analysis, food preservation, sanitation, instrumentation, processing machinery, and business management.

The Institute has a well-equipped experimental processing laboratory that enables the student to become familiar with a wide variety of food processing methods and testing procedures. Organized trips to industrial food plants and laboratories will allow him to study and observe the operations performed in commercial food manufacturing, testing, and research.

The graduate in the Food Processing Option will be well qualified to seek employment in the many branches of the food-manufacturing industry; for example, technicians are required in quality-control laboratories where chemical, physical, and bacteriological tests are performed on food materials before and during processing, and on the finished packaged products. The graduate will also be qualified to operate special equipment and to supervise processes within the food plant itself. Further employment opportunities exist in government laboratories and inspection services. Opportunities for advancement are good.



FOOD TECHNOLOGY

YEAR 1 — *Term 1*

No.	Subject	Hours per Week Lec.	Lab.
31.101	Writing in a Technical Context	2	1
32.101	Mathematics	3	2
30.101	General Chemistry	3	3
33.102	Introductory Physics	3	2
44.121	Introductory Food Microbiology	2	4
44.122	Biology	2	3
	Library and Research	—	5
		15	20

Term 2

No.	Subject	FOOD PRODUCTION OPTION Hours per Week Lec.	Lab.	FOOD PROCESSING OPTION Hours per Week Lec.	Lab.
31.201	Writing in a Technical Context	2	1	2	1
32.246	Mathematics	3	2	3	2
30.201	General Chemistry	3	3	3	3
33.202	Introductory Physics	3	2	3	2
44.201	Food Processing	—	—	3	3
44.221	Microbiology for Food Processing	—	—	2	3
44.251	Food Production	3	3	—	—
44.223	Microbiology for Food Production	2	3	—	—
	Library and Research	—	5	—	5
		16	19	16	19

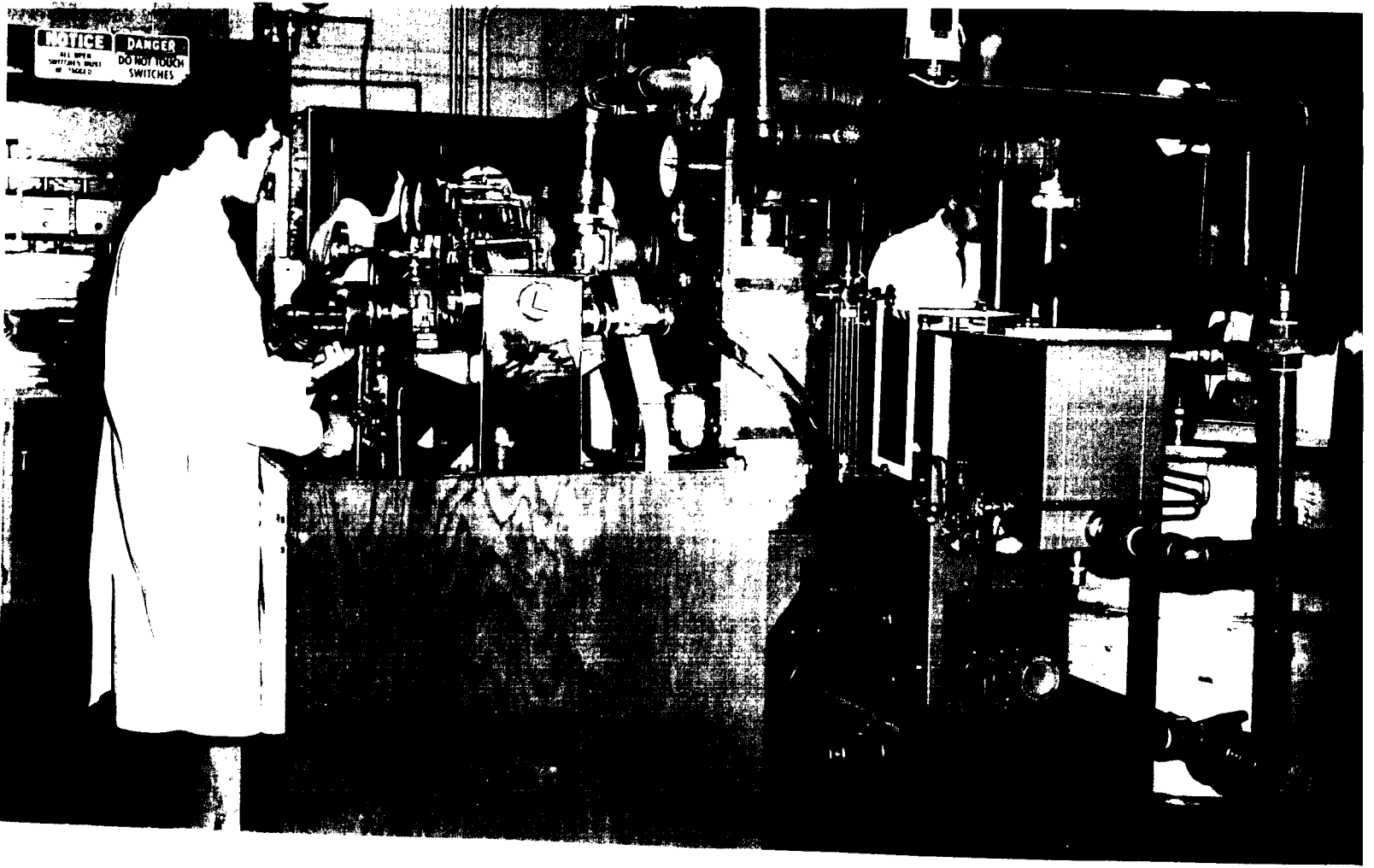
YEAR 2 — *Term 3*

31.301	Writing in a Technical Context	1	1	1	1
30.303	Instrumental Analytical Methods	2	3	2	3
44.312	Introductory Food Analysis	2	3	2	3
44.341	Mechanics of Machines	2	2	2	2
48.350	Instrumentation	—	—	1	2
90.230	Business	—	—	2	1
44.301	Food Processing	—	—	2	3
44.311	Quality Control	—	—	1	2
44.352	Genetics for Food Production	2	2	—	—
44.361	Crop Technology	3	3	—	—
44.371	Animal Technology	2	2	—	—
	Library and Research	—	5	—	5
		14	21	13	22

Term 4

31.401	Writing in a Technical Context	1	1	1	1
48.450	Instrumentation	—	—	1	2
90.390	Introduction to Work Study	—	—	1	1
44.401	Food Processing	—	—	2	3
44.402	Process Analysis	—	—	2	3
44.411	Quality Control	—	—	1	3
44.412	Food Analysis	—	—	2	3
44.431	Sanitation	—	—	1	3
44.413	Agricultural Analysis	2	3	—	—
44.414	Experimental Techniques	2	2	—	—
44.442	Agricultural Mechanics	2	3	—	—
44.462	Crop Protection	3	3	—	—
44.481	Soil Technology	2	3	—	—
44.491	Agricultural Products Marketing	2	1	—	—
	Library and Research	—	5	—	5
		14	21	11	24

General Prerequisite: Graduation on the Academic-Technical Programme.
Special Prerequisites: Mathematics 12; Chemistry 11.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Forest Products Technology

The modern forest industry of British Columbia offers challenging and rewarding employment for conscientious young people of ability and training. The demand increases yearly as the application of new technology continues in the pulp, newsprint, plywood, sawmill, and particle-board industries.

The objectives of the Forest Products Technology programme are to qualify technologists for the various manufacturing operations and to prepare them for responsible positions in British Columbia's largest industry. For example, young men with a good knowledge of technological advances and their application are needed in plant process operations, research and development, technical services, and sales.

In addition to the basic sciences of mathematics, chemistry, and physics, the specialized first-year subjects include an introduction to forest science, wood technology, sawmilling, plywood, and pulp and paper manufacture. This programme will assist the student in selecting one of two distinctly different options offered during the second year.

Wood Option

The Wood Option includes the techniques and economics involved in harvesting wood and converting to usable products such as lumber, laminated beams, plywood, and particle-board. Wood seasoning, wood preservation, and fire-retardant treatments are also covered, as well as the integration of the forest industries for maximum utilization.

Wood Option students receive training in wood processing, wood properties, wood products marketing, quality control (including lumber grading), work study, statistics, mechanical and electrical equipment, and kiln drying.

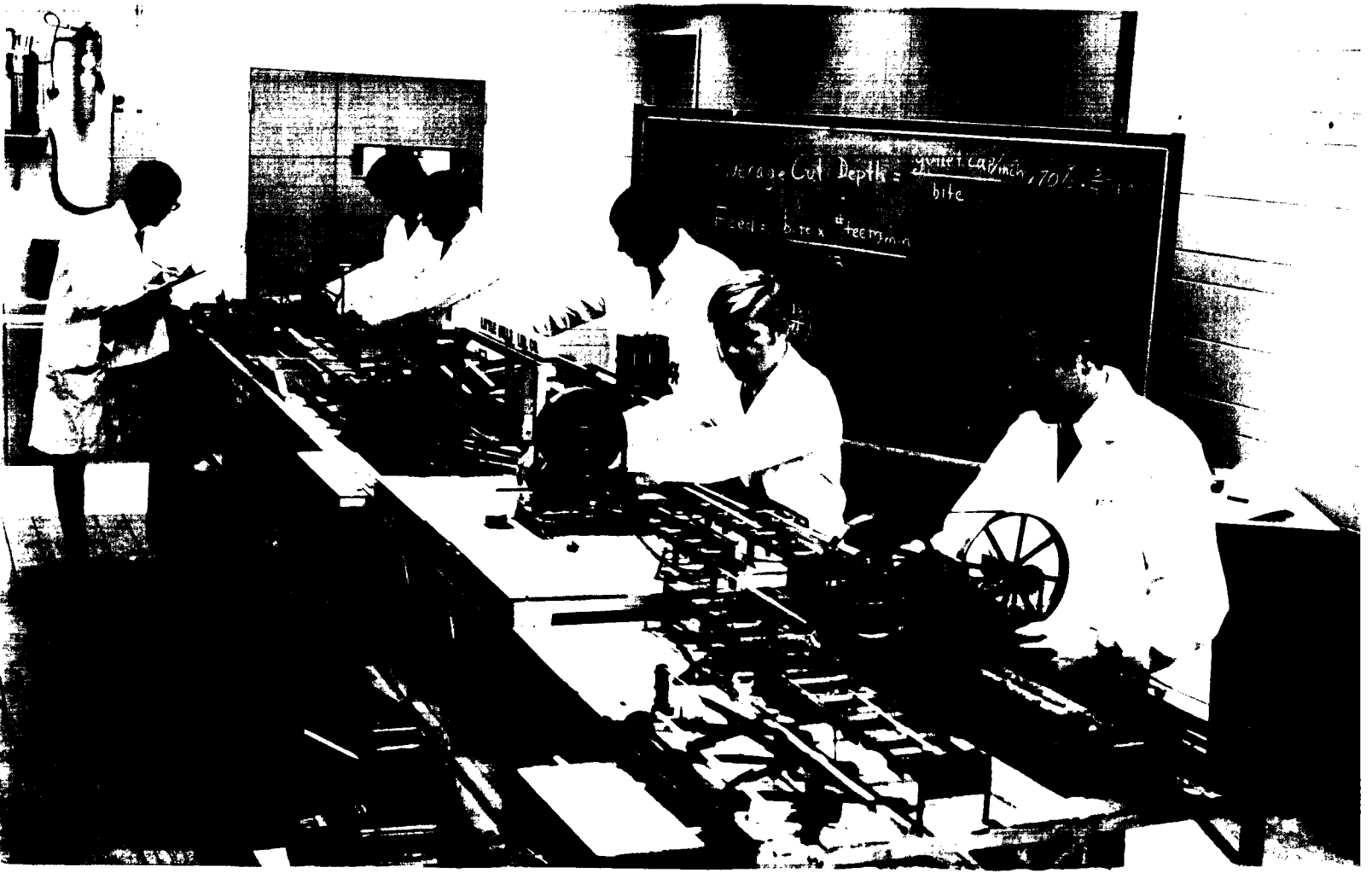
Pulp and Paper Option

The Pulp and Paper Option students are concerned with the theory and application of technology in mechanical and chemical pulping processes, the bleaching of various pulp types, and the conversion of pulp to end products such as newsprint, paper, paperboard, and textiles.

The Pulp and Paper Option students receive training in pulp and paper technology and testing, unit operations, instrumentation, wood chemistry, and laboratory techniques.

Laboratory and plant procedures are covered extensively in both options and, in addition to extensive laboratory facilities, field trips to various related industrial operations are undertaken to augment classroom and laboratory instruction.

To graduates, the industry offers interesting, challenging, and rewarding work with ample opportunity for advancement.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FOREST PRODUCTS TECHNOLOGY

YEAR 1 — *Term 1*

No.	Subject	Hours per Week Lec.	Lab.
31.101	Writing in a Technical Context	2	1
32.100	Mathematics	2	3
33.102	Introductory Physics	3	2
30.101	General Chemistry	3	3
49.101	Draughting		2
41.103	Engineering Materials	2	
45.101	Forest Science	2	3*
45.107	Forest Utilization	2	3*
	Tutorials		2
	Technical Reading		3
		16	19

Term 2

31.201	Writing in a Technical Context	2	1
32.212	Mathematics	2	3
33.202	Introductory Physics	3	2
30.201	General Chemistry	3	3
49.201	Draughting		2
41.203	Engineering Materials	2	
45.201	Forest Science	2	3*
46.207	Forest Utilization	2	3*
	Tutorials		2
	Technical Reading		3
		16	19

* Alternate weeks.
† Three hours laboratory, 1 hour tutorial, alternate weeks.

YEAR 2 — *Term 3*

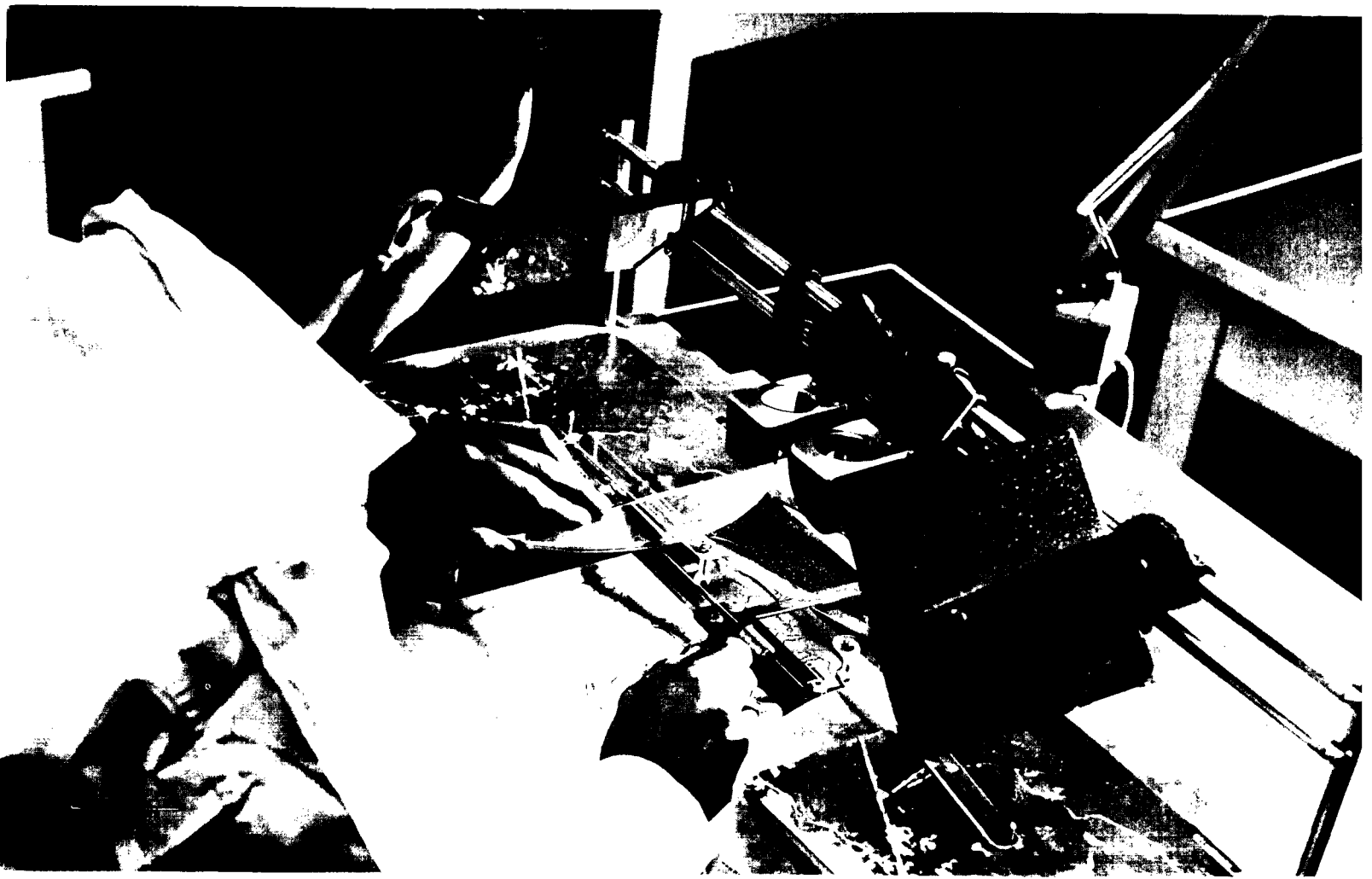
No.	Subject	PULP AND PAPER OPTION Hours per Week Lec.	Lab.	WOOD OPTION Hours per Week Lec.	Lab.
31.301	Writing in a Technical Context	1	1	1	1
32.304	Mathematics	2	3	2	3
30.304	Chemical Laboratory Techniques		3		3
48.350	Instrumentation	1	2	1	2
	Technical Reading		3		3
30.303	Instrumental Analytical Methods	2*	2*		
47.341	Unit Operations	3	3		
46.301	Pulp and Paper Technology	3	3		
46.304	Pulp and Paper Testing	2	3		
46.311	Wood Properties			2	4
46.314	Wood Processing			2	3
46.317	Quality Control and Marketing			2	3
90.390	Work Study			1	2
		13	22	11	24

Term 4

31.401	Writing in a Technical Context	1	1	1	1
32.466	Mathematics	2	3	2	3
	Technical Reading		3		3
30.303	Instrumental Analytical Methods	2*	2*		
47.441	Unit Operations	3	3		
46.401	Pulp and Paper Technology	3	3		
46.404	Pulp and Paper Testing	3	3		
46.407	Wood Chemistry	2	3		
46.451	Mechanical and Electrical Equipment			2	3
46.411	Wood Properties			2	3
46.414	Wood Processing			3	4
46.417	Quality Control and Marketing			2	3
46.421	Wood Products Management				3
		15	20	12	23

* Alternate weeks.

General Prerequisite: Graduation on the Academic-Technical Programme.
Special Prerequisites: Mathematics 12 and Chemistry 11.



Forestry Technology

The forests of British Columbia constitute the most valuable natural resource, and their utilization provides the greatest single source of income to the Province, supporting approximately one third of our population. A tremendous expansion in the harvesting of timber products is creating demands for new techniques in logging, manufacturing, and reforestation. Thus, there is today a greatly increased demand for technically trained men in this industry.

Since many opportunities are available in forestry, the graduate can expect to qualify for several categories of employment. In logging he will study the systems commonly used in British Columbia and the factors determining their applicability. He will analyse logging costs for the various systems and will study the typical problems encountered in the organization and supervision of log production; in cruising and stand management he will cruise timber stands for inventory and logging development; in research he will study characteristics of trees and wood for a multiplicity of uses; in forest protection he will plan and direct programmes to minimize losses from fire, insects, and disease; in reforestation he will supervise regeneration surveys, planting or seeding, and nursery operations. In addition, technicians employed by public agencies will be engaged in scaling, protection, research, or inspection of logging or milling operations.

Candidates for this programme should possess initiative and leadership qualities, be able to work efficiently under adverse circumstances, and require a minimum of supervision. The business of forestry is dynamic and constantly faced with new and perplexing problems. Forest technicians must be resourceful, conscientious, and not easily deterred by unfavourable weather and working conditions. Applicants should possess good health, particularly good eyesight, be prepared to adjust to life in a small community or camp, and adapt to spending most of their time out of doors. It is important that prospective students consider their own personality and interest. With a genuine interest in the work, not only will they be happier, but they will be much more likely to succeed.

A good background in mathematics, physics, and English is desirable for an applicant in this technology. The Forestry Technology programme will include such subjects as draughting, surveying, forest measurement, interpretation of aerial photographs, logging methods, and wood utilization. Advanced subjects include details of scaling and cruising, entomology, pathology, fire protection, silviculture, and forest management.

FORESTRY TECHNOLOGY

YEAR 1 — *Term 1*

No.	Subject	Hours per Week Lec.	Lab.
31.101	Writing in a Technical Context	2	1
32.100	Mathematics	3	2
51.102	Surveying		3
45.101	Forest Science	2	3*
45.107	Forest Utilization	2	3*
45.102	Forest Measurement	1	6*
45.110	Fire Control	1	6*
45.106	Photo Interpretation and Mapping	1	3
	Tutorials		1
	Technical Reading		4
		12	23

Term 2

31.201	Writing in a Technical Context	2	1
32.242	Mathematics	3	2
45.206	Photo Interpretation and Mapping	1*	3
51.202	Surveying	1*	3*
45.201	Forest Science	2	3*
45.207	Forest Utilization	2	3*
45.202	Forest Measurement	2	6*
45.205	Logging	2	6*
	Tutorials		1*
	Technical Reading		4
		14	21

YEAR 2 — *Term 3*

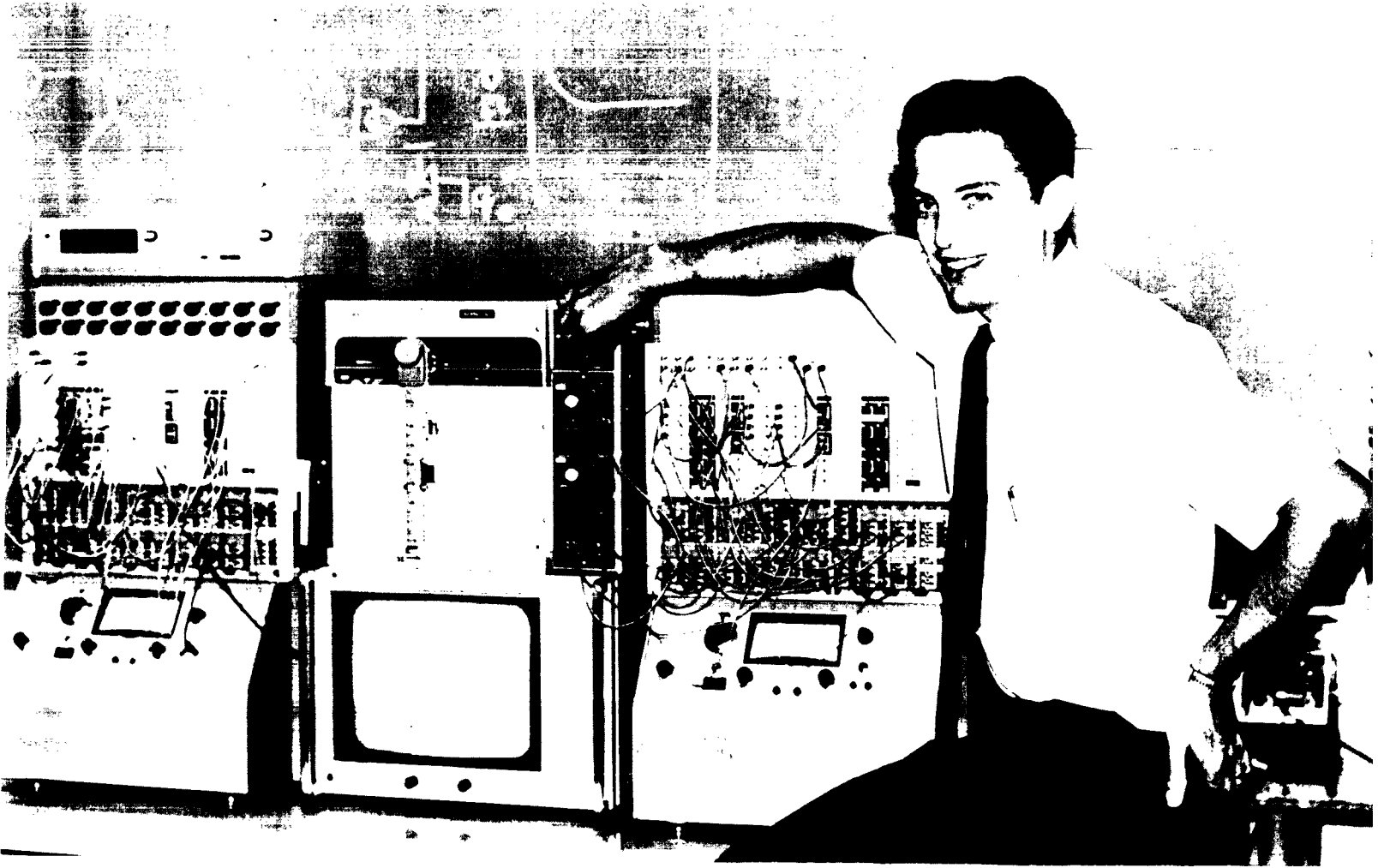
31.301	Writing in a Technical Context	1	1
45.302	Forest Measurement	1	5
45.305	Logging	2	3
45.308	Roads and Transportation	1	4
45.309	Silviculture	1	3
45.313	Forest Pathology	1	3
45.316	Forest Management	2	1
90.351	Scientific Computer Programming	1	1
	Technical Reading		4
		10	25

Term 4

31.401	Writing in a Technical Context	1	1
45.402	Forest Measurement	1	4
45.408	Roads and Transportation	2	4
45.409	Silviculture	1	3
45.414	Forest Entomology	1	3
45.416	Forest Management		2
45.410	Fire Control	1	3
90.424	Personnel Administration	2	
	Tutorials		1
	Technical Reading		5
		9	26

* Alternate weeks.

General Prerequisite: Graduation on the Academic-Technical Programme.
Mandatory Prerequisite: Mathematics 12.



Instrumentation Technology

Perhaps the most important single factor in industry today is the ability to measure. If reliable measurements are available from all parts of an industrial operation, the remaining steps toward automatic control are relatively straightforward. The science of measurement and control are therefore closely related and both areas fall within the domain of the instrumentation technologist.

Process measurement may involve simple areas such as temperature, pressure, flow, weight, or it may involve the complex anlysis of a chemical composition. In a typical process there are hundreds of different measurements being continually relayed to a central control room. Measurement can also be broken down into the areas of sensing, signal transmission, and signal display. The area of display may again be broken down from a simple gauge or an alarm to a complex recorder or a data logging device. So it will be seen that the subject of *process measurement* is very much a part of modern automation. It should be noted that in this regard the term " process " may include a freight yard, bottling plant, automatic container-handling, and so on.

The space race is responsible for much of the rapid growth in instrumentation over the last decade. Advances in electronics and fluidics are adding a whole new dimension to the scope of automatic control.

In order to automate any process, certain process measurements must be selected for control. These measurements must be compared with their desired control points to see whether errors exist; if errors do exist, signals are sent back to the process to correct the setting of a valve, damper, conveyor, etc. In its simplest form each control " loop " is handled by a separate piece of equipment known as a controller. Today there is a decided trend toward handling all loops on a single electronic computer so that it now becomes possible to optimize the over-all plant output rather than merely maintain constant control levels. There is currently much industrial activity centred around the adaptation of computers to plants, and vice versa.

From the above decription you will see why instrumentation today is often referred to as systems engineering. Persons considering a career in this field should show strength and interest in mathematics, physics, and chemistry (*see* prerequisites). The record shows that over half the graduates can expect to be placed in engineering or research departments, while the remainder may find their way into plant work or sales. Demand for graduates by industry has been so good that most graduates find the right opportunity before they leave the Institute.

Perusal of the Subject Summaries at the end of this booklet will give details of the course. Concentration on some basic " academics " is needed in the early stages to equip students for the proper depth of understanding. Primary areas of specialization are to be found in the subjects Process Measurement, Process Control, and Computer Techniques.

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INSTRUMENTATION TECHNOLOGY

YEAR 1 — *Term 1*

No.	Subject	Hours per Week Lec.	Lab.
31.101	Writing in a Technical Context	2	1
32.101	Mathematics	3	2
33.106	General Physics (B1)	3	2
41.103	Engineering Materials	2	3*
43.132	Electrical Fundamentals	2	3
48.100	Process Measurements	3	3
48.110	Instrument Shop Practice	....	3*
	Tutorial	....	3*
	Library and Research	....	5
		15	18/20

Term 2

31.201	Writing in a Technical Context	2	1
32.223	Mathematics	3	2
33.206	General Physics (B2)	3	2
41.203	Engineering Materials	2	3*
30.202	Chemistry	2	2
43.232	Electronic Fundamentals	3	3*
48.200	Process Measurements	3	3
	Library and Research	....	5
		18	17/19

YEAR 2 — *Term 3*

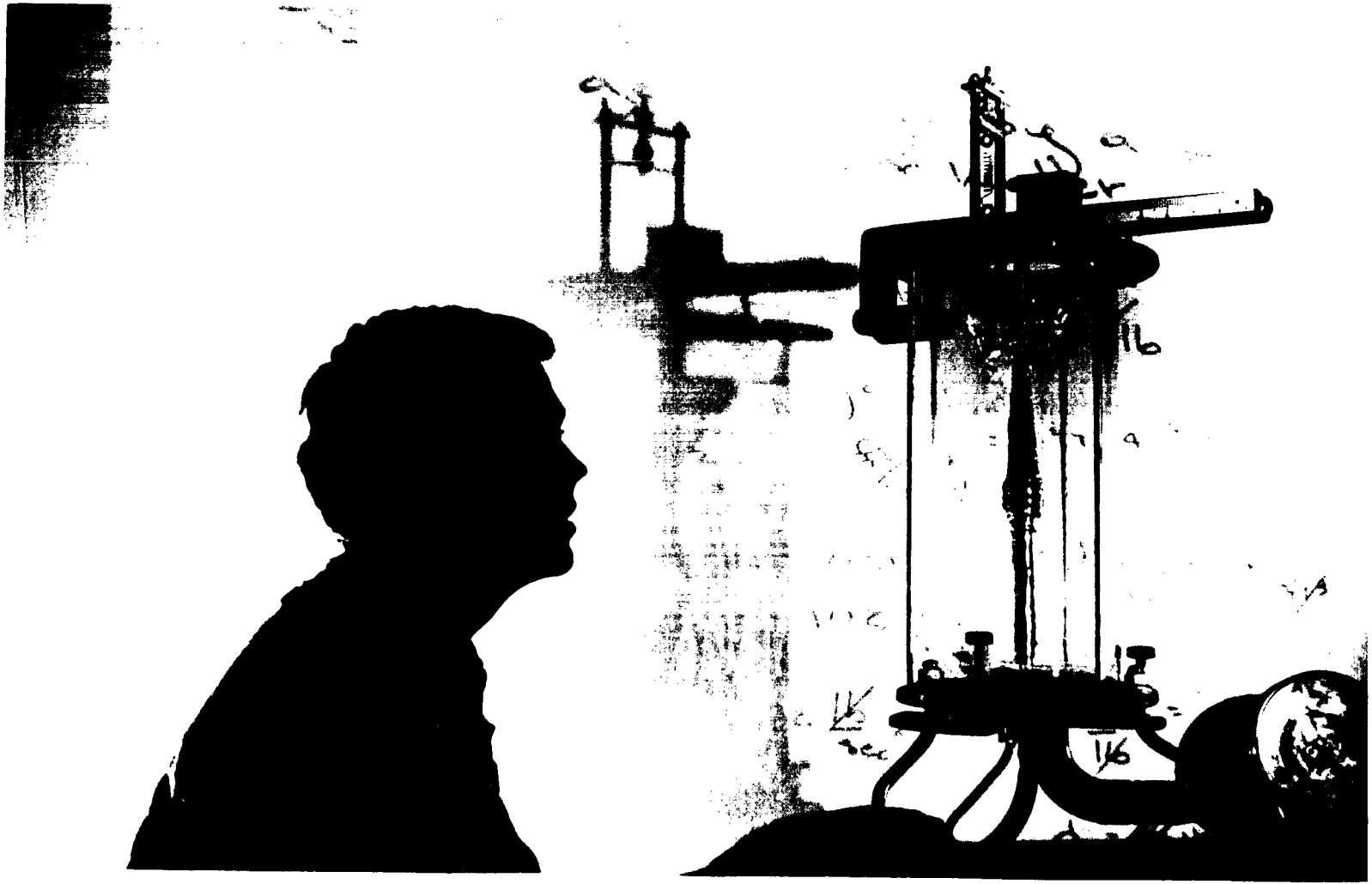
32.306	Mathematics	3	2
47.341	Unit Operations	3	3*
48.300	Process Measurements	3	3
48.310	Process Control	3	3
48.320	Computer Techniques	3	3*
48.330	Instrumentation Electronics	2	3*
	Library and Research	....	5
		17	16/19

Term 4

47.441	Unit Operations	3	3
48.400	Process Measurements	3	3
48.410	Process Control	3	3
48.420	Computer Techniques	3	3*
48.430	Industrial Practices	3	3*
90.351	Scientific Computer Programming	1	1
	Library and Research	....	6
		16	19

* Alternate weeks.

General Prerequisite: Graduation on the Academic-Technical Programme.
Special Prerequisites: Mathematics 12 plus Physics 11.



Mechanical Technology

Mechanical Technology encompasses an extremely broad range of industrial activities involving design, construction, installation, and use of machines and mechanical devices of all types, as well as the manufacture of goods in general. It follows that persons qualified in this field can expect challenging and rewarding employment in a wide range of interesting occupations.

The two-year Mechanical Technology programme offers intensive training leading to graduation as a mechanical technologist. Job possibilities include work in consulting engineering offices as mechanical design draughtsmen on machinery, steelwork, piping, power plants, and installation; in plant engineering offices, production departments, and estimating departments; in testing and inspection establishments; in field installation and service; and in machinery sales.

The programme includes studies in mathematics and physics plus specialized subjects such as engineering materials, draughting, strength of materials, machine design, fluid mechanics, fluid power, thermal engineering, electricity, and machine tools. Theory presented in lectures is directly applied in problem periods, design drawing sessions, and laboratory assignments utilizing excellently equipped laboratories and shops. In the thermodynamics laboratory, for example, students operate and test steam boilers, air compressors, a steam turbine, gas turbine, dual-fuel engine, and other equipment, while in the machine shop they use engine lathes, milling machines, a turret lathe, jig borer, boring mill, precision grinders, punch press, and other modern equipment. In the fluid mechanics laboratory, students use sets of miniaturized equipments to perform many standard hydraulics experiments. In the fluid power laboratory, industrial and training circuits are designed, constructed, and operated, utilizing standard industrial components.

To augment these studies, field trips are made to industrial plants to observe practical installations and operations. Close liaison with industry ensures that graduates are trained to meet the exacting and varying requirements of industry. Coincidentally, this liaison acquaints students with the range of opportunities available and assists them in selecting their individual areas of greatest interest.

To span the broad field of Mechanical Technology, two options are provided, subject to adequate enrolment in each—(1) Production, (2) Design. Choice of option will be made at the end of the first year.

Those best suited to take advantage of this training will be students interested in applying scientific knowledge to practical use in the mechanical field. The aspiring technologist must have a sound grounding in mathematics and physics, and should be able to apply ideas in practical situations. Because the mechanical technologist normally functions as a key member of a closely knit team of engineers, production supervisors, craftsmen, and others, his ability to work with people effectively and congenially is essential. Working conditions generally are attractive, and physical requirements are not demanding.

MECHANICAL TECHNOLOGY

YEAR 1

Term 1

No.	Subject	Hours per Week Lec.	Lab.
31.101	Writing in a Technical Context	2	1
32.101	Mathematics	3	2
33.107	General Physics (C1)	3	2
49.101	Draughting		2
41.103	Engineering Materials	2	3*
49.105	Applied Mechanics	3	3*
49.150	Production Engineering	2	2
49.165	Shopwork		3
	Library and Research		5
		15	20

Term 2

31.201	Writing in a Technical Context	2	1
32.223	Mathematics	3	2
33.207	General Physics (C2)	3	2
49.201	Draughting		2
41.203	Engineering Materials	2	3*
49.210	Strength of Materials	3	3*
49.225	Applied Heat	1	1
49.250	Production Engineering	2	2
49.265	Shopwork		3
	Library and Research		3
		16	19

YEAR 2

Term 3

		Production Option		Design Option	
		Hours per Week		Hours per Week	
No.	Subject	Lec.	Lab.	Lec.	Lab.
31.301	Writing in a Technical Context	1	1	1	1
32.306	Mathematics	3	2	3	2
49.301	Engineering Graphics		2		2
49.312	Machine Design	3	2	3	2
49.315	Fluid Mechanics	2	2	2	2
43.331	Electrical Equipment Applications	2	1	2	1
49.350	Production Engineering	2	2		
49.365	Shopwork		3		
90.391	Work Study I	1	2		
48.350	Instrumentation			1	2
49.325	Thermal Engineering			2	3
90.390	Introduction to Work Study			1	2
	Library and Research		4		3
		14	21	15	20

Term 4

31.401	Writing in a Technical Context	1	1	1	1
32.445	Mathematics	3	2	3	2
49.435	Fluid Power	2	3	2	3
49.455	Tool Design	1	2	1	2
49.465	Shopwork		3		3
49.445	Manufacturing Processes	2	4*		
49.450	Production Engineering	2	2		
90.491	Work Study II	1	3		
48.450	Instrumentation			1	2
49.412	Machine Design			3	2
49.425	Thermal Engineering			3	3
	Library and Research		5		3
		12	23	14	21

* Alternate weeks.

General Prerequisite: Graduation on the Academic-Technical Programme.

Special Prerequisites: Mathematics 12 and Physics 11.

Mining Technology

During the past decade as a supplier of metals to the entire world, Canada has been increasing its share of the market and has now become a major producer of such metals as iron, asbestos, lead, nickel, silver, and zinc. Western Canada is now about to experience an unprecedented expansion of the mining industry. Exploration in British Columbia and the Yukon is more active than anywhere in North America, and the area is considered to be the most promising mineral-bearing region on the continent. Coupled with this is the great interest shown in the non-metallic mineral deposits now being developed on the Prairies. Several major discoveries, currently being examined, offer reasonable assurance of production and consequent demand for engineers and technicians.

Because of strong international competition, the higher costs of operation in our rugged terrain, and the increasingly complex ores now being sought, the industry is becoming much more reliant upon engineering imagination and technological skill.

The programme of Mining Technology is designed to serve this major industry by preparing technicians to help search for new mineral deposits, develop and operate new mines, and design and operate new mineral-processing plants. Most students who complete this programme can expect to enter the industry as exploration assistants mapping structure, logging drill core, or performing geophysical and geochemical tests in the field; as engineering assistants sampling developed rock, surveying in pits or underground, or doing production control work in mines; or as test laboratory technicians, assayers, or junior operating staff in mineral-processing plants.

Opportunities for advancement in this industry are good for a person of ability and initiative, and, possibly within 5 years of graduation, he might well achieve a supervisory rank as party chief, shiftboss, or foreman.

Men entering the mining industry should be able to get along with people, be able to enjoy life in smaller communities, and be willing to travel. They should also have good health and be able to pass a medical examination and chest X-ray if they wish to work in or around a mine.

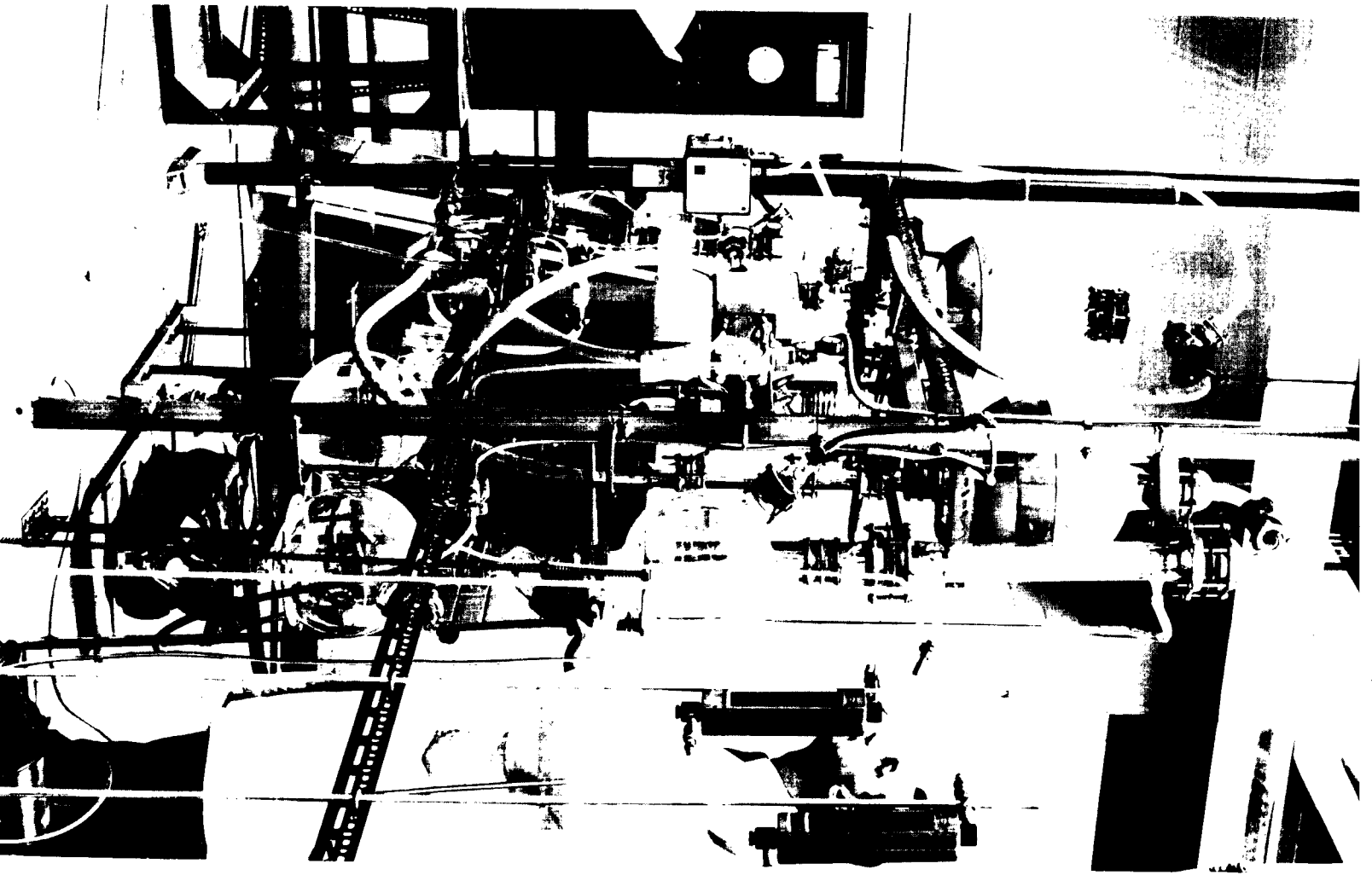
MINING TECHNOLOGY

No.	Subject	Hours per Week Lec.	Lab.
	YEAR 1 *Term 1*		
31.101	Writing in a Technical Context	2	1
32.101	Mathematics	3	2
33.101	General Physics (A1)	3	3
30.101	General Chemistry	3	3
49.101	Draughting	....	2
51.102	Surveying	....	3
50.101	Geology	2	2*
50.102	Mining	2	....
	Library and Research	....	6/4
		15	20
	Term 2		
31.201	Writing in a Technical Context	2	1
32.242	Mathematics	3	2
33.201	General Physics (A2)	3	3
30.201	General Chemistry	3	3
49.201	Draughting	....	2
51.202	Surveying	....	3
50.201	Geology	2	2*
50.202	Mining	2	....
	Library and Research	....	6/4
		15	20
	YEAR 2 *Term 3*		
31.301	Writing in a Technical Context	1	1
32.303	Mathematics	3	2
42.103	Statics	2	2
41.305	Assaying (Laboratory Option)	1	6
41.306	Assaying (Mining Option)	1	3
51.310	Surveying (Mining Option)	....	3
50.301	Geology—Structural	2	3*
50.304	Mineral Processing	2	3*
50.302	Mining—Operation and Equipment	2	3*
33.304	Introduction to Geophysical Prospecting Methods	....	3*
	Library and Research	....	4
		13	22
	Term 4		
31.401	Writing in a Technical Context	1	1
32.456	Mathematics	3	2
42.205	Strength of Materials	....	2
42.202	Hydraulics	2	2*
41.405	Assaying (Laboratory Option)	1	6
41.406	Assaying (Mining Option)	1	3
51.410	Surveying (Mining Option)	....	3
50.401	Geology—Mineral Deposits	2	3*
50.404	Mineral Processing	2	3*
50.402	Mining—Operation and Equipment	2	2
	Library and Research	....	6/4
		13	22

* Alternate weeks.

General Prerequisite: Graduation on the Academic-Technical Programme.

Special Prerequisites: Mathematics 12 and any three of Physics 11, 12 and Chemistry 11, 12.



Natural Gas and Petroleum Technology

The gas and oil industry offers a wide variety of employment opportunities for a qualified technician. The transmission branch of the industry, involving the operation of pumping stations and maintenance of pipe-lines over vast areas, offers graduates opportunity for outdoor work in remote regions. On the other hand, the refining branch of the industry, usually located in more populous areas, offers a stable source of interesting work if this is preferred. Moreover, the industry as a whole is one of the most modern and up to date and is constantly introducing the latest technological improvements. Thus, there is every opportunity for a keen technician to advance in an interesting and profitable vocation.

The first year of the programme offered at the Institute primarily covers basic scientific and engineering principles as a foundation for the subsequent specialized petrochemical training. Training will be provided in the distribution and utilization of gas in both industrial and domestic fields, and there will be considerable emphasis on measurement and automatic control since the trend is toward completely unmanned automatic installations. Tuition will be given in the transmission of oil and its utilization in modern automatically controlled refineries, and there will be emphasis on the chemistry of petroleum products. The course will include a brief orientation course in business practices, computer programming, and frequent opportunities for field trips to local installations.

Students desiring to enter this field should have a keen interest in the operation of large-scale equipment, as distinct from its maintenance and repair, and should have a good academic standing in chemistry and physics. Although in modern refineries most of the time may be spent indoors, technicians should be prepared to work outdoors for lengthy periods. They must be prepared, in the plant operations, to take great responsibility for the satisfactory and safe operation of highly complex plant equipment.

Employment opportunities for technicians include laboratory work, studies of corrosion of above-ground and buried structures, analysis of oils, gases, and petroleum products, right-of-way land work, and plant operation in pumping stations and refineries. With such a variety of opportunities, a qualified technician should have no difficulty in establishing himself in a profitable and interesting career.

NATURAL GAS AND PETROLEUM TECHNOLOGY

YEAR 1 — *Term 1*

No.	Subject	Hours per Week Lec.	Lab.
31.101	Writing in a Technical Context	2	1
32.101	Mathematics	3	2
33.101	General Physics (A1)	3	3
30.101	General Chemistry	3	3
49.101	Draughting	—	2
41.103	Engineering Materials	2	3*
51.104	Surveying	—	3
90.230	Business	2	1
	Library and Research	—	2/5
		15	20

Term 2

31.201	Writing in a Technical Context	2	1
32.223	Mathematics	3	2
33.201	General Physics (A2)	3	3
30.201	General Chemistry	3	3
47.221	Gas Distribution and Utilization	3	3
49.266	Introduction to Machine Tools	1	1
90.390	Work Study	2	—
	Library and Research	—	5
		17	18

YEAR 2 — *Term 3*

32.305	Mathematics	3	2
47.341	Unit Operations	3	3
47.311	Gas and Oil Production and Transmission	3	3
30.302	Physical Chemistry	2	3
43.132	Electrical Fundamentals	2	3
48.350	Instrumentation	—	3
	Library and Research	—	5
		13	22

Term 4

32.464	Mathematics	3	2
47.441	Unit Operations	3	3
48.450	Instrumentation	—	3
30.404	Organic Chemistry	2	3
90.351	Scientific Computer Programming	2	—
47.431	Oil Refining and Utilization	5	4
	Library and Research	—	5
		15	20

* Alternate weeks.

General Prerequisite: Graduation on the Academic-Technical Programme.
Special Prerequisites: Mathematics 12; Physics 11; Chemistry 11.

Surveying Technology

Survey techniques have undergone radical changes during the last two decades, due largely to advances in the development of electronic devices which are capable of measuring distance up to 40 miles with an accuracy of three parts per million, and significant refinements which have been made in photographic equipment and their applications to aerial photogrammetry.

The two-year programme in the Surveying Technology has two main objectives. The first is to equip the student with the required knowledge of mathematics, physics, astronomy, photogrammetry, and theory of surveying, together with the practical skills in note-keeping, draughting, field operations, and calculating so that he may be employed as a surveying or engineering assistant in the various fields where survey techniques are used. The second objective is to provide those students with the knowledge and skills which, with experience, will eventually qualify them as members of the Corporation of Land Surveyors of British Columbia.

Intensive courses will be given in mathematics, physics, photogrammetry, astronomy, natural science, and descriptions for deeds, in which the standards are those required by the Corporation of Land Surveyors of British Columbia. A student who has successfully completed this programme may, after three years of articles with a qualified land surveyor, sit for the final examination of the Corporation and obtain a commission as a British Columbia land surveyor.

Employment opportunities in survey fields are widely varied. Surveyors, consulting engineers, the oil and gas industry, government mapping departments, government highway departments, utility companies and civic planning and engineering departments are among those that offer employment to graduates. Areas of employment in Canada range from the southern border to the Arctic regions and from the Pacific to the Atlantic Ocean and many Canadian surveyors are employed on large mapping projects throughout the world.

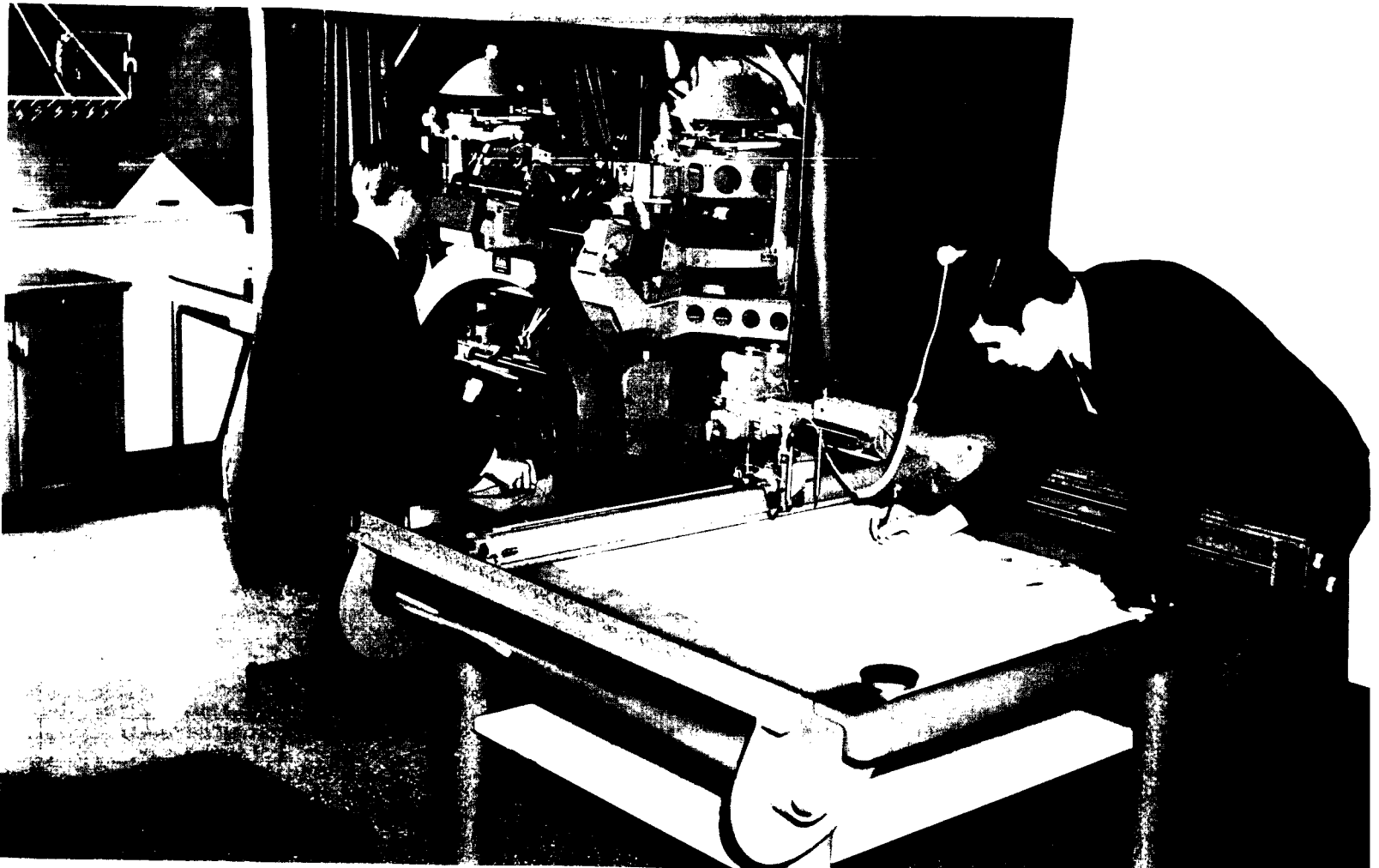
The student requires a good basic understanding of mathematics and physics to the University Entrance level and should also be physically and mentally suited to outdoor and office work.

In the second year the students may study in the Survey or Photogrammetry Option.

SURVEYING TECHNOLOGY
SURVEY OPTION

No.	YEAR 1 — *Term 1* — Subject	Hours per Week Lec.	Lab.
31.101	Writing in a Technical Context	2	1
32.101	Mathematics	3	2
33.107	General Physics (C1)	3	2
49.101	Draughting	—	2
51.101	Surveying	3	8
	Tutorials	—	4
	Library and Research	—	5
		11	24
	Term 2		
31.201	Writing in a Technical Context	2	1
32.226	Mathematics	3	2
33.207	General Physics (C2)	3	2
49.201	Draughting	—	2
51.201	Surveying	2	8
51.203	Natural Sciences	1	2
	Tutorials	—	2
	Library and Research	—	5
		11	24
	YEAR 2 — *Term 3*		
32.304	Mathematics	3	2
51.301	Plane Surveying II	1	—
51.302	Geodetic Surveying II	1	—
51.303	Computations II A and B	1	2
51.304	Field Surveying II	1	6
51.305	Draughting	—	4
51.306	Astronomy	2	—
51.307	Photogrammetry	2	—
51.308	Description for Deeds	2	—
	Tutorials	—	3
	Library and Research	—	5
		13	22
	Term 4		
32.435	Mathematics	3	2
51.401	Plane Surveying A II	1	—
51.402	Geodetic Surveying B II	1	—
51.403	Computations II A and B	1	2
51.404	Field Surveying II	—	9
51.406	Astronomy	2	2
51.407	Photogrammetry	2	2
	Tutorials	2	3
	Library and Research	—	5
		10	25

General Prerequisite: Graduation on the Academic-Technical Programme.
Special Prerequisites: Mathematics 12; Physics 11.



SURVEYING TECHNOLOGY

PHOTOGRAMMETRY OPTION

YEAR 2 — *Term 3*

No.	Subject	Hours per Week Lec.	Lab.
32.304	Mathematics	3	2
51.311	Surveying	2	0/3*
51.306	Astronomy	2	----
51.317	Photogrammetry	3	12/9*
51.313	Draughting	1	3
	Tutorials	----	2
	Library and Research	----	5
		11	24

Term 4

32.435	Mathematics	3	2
51.411	Surveying	2	2
51.406	Astronomy	2	2
51.417	Photogrammetry	3	12
	Tutorials	----	2
	Library and Research	----	5
		10	25

* Alternate weeks.

Health Technology

The rising demand for health services, together with the increasingly complex scientific and social aspects of such services, is opening up new and challenging employment opportunities for a wide range of specialist health technologists.

The Health Technology training programmes, developed with the advice and counsel of leaders in the health sciences, and operated in conjunction with health facilities within the community, aim to produce technologists at a level of education and training suited to the need in the health field.

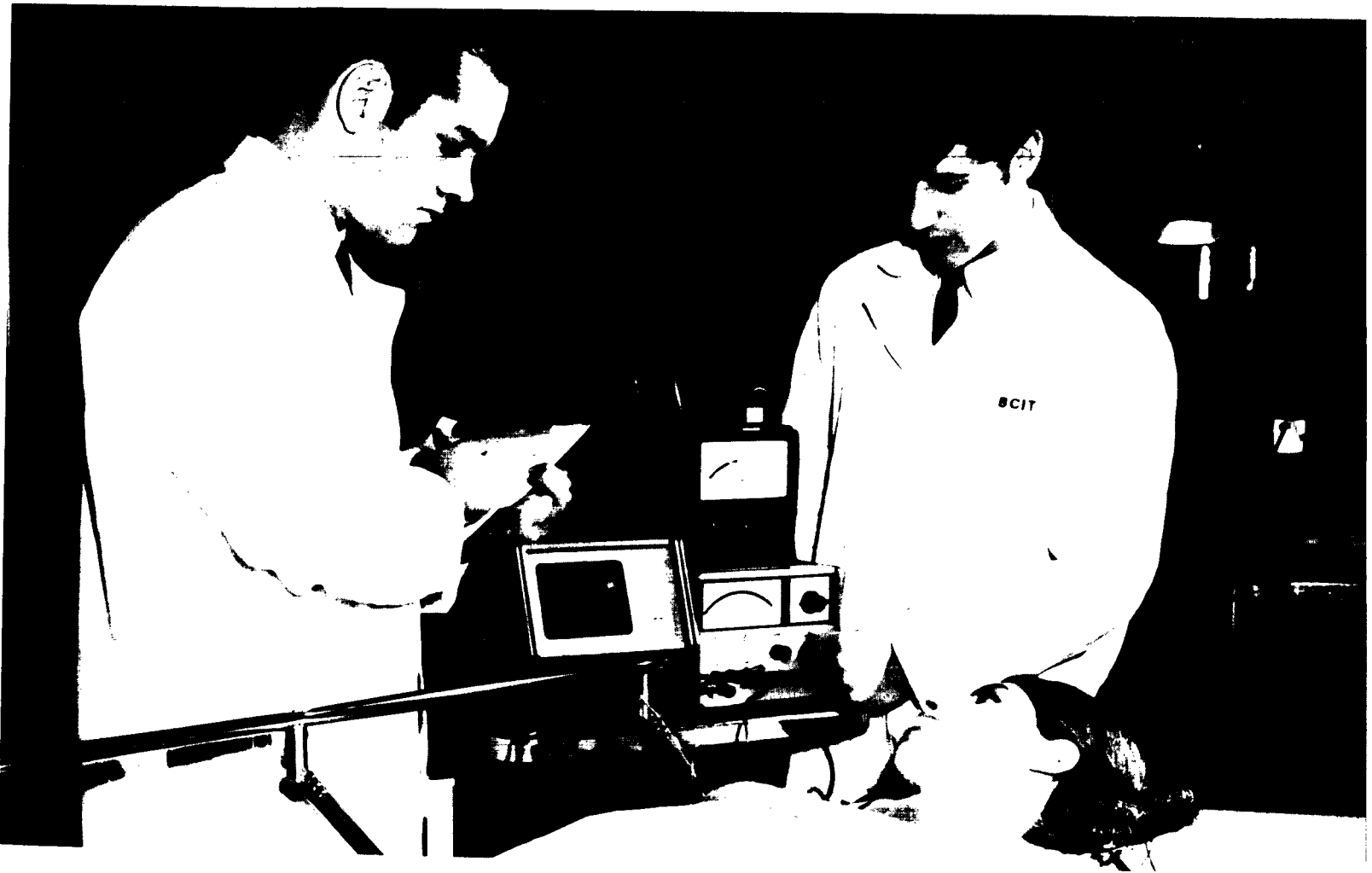
It is intended that the education provided will develop in the graduate a general understanding of the cultural and health environment in which he or she is to work. The training in the specific areas of choice will be sufficiently detailed to provide the skills necessary to the specialty.

It is expected that the health technologist will work at a level between the professional and vocational worker, acting as a junior colleague or in immediate support of the professional whose responsibilities in the field of health have to do with prevention, diagnosis and treatment, or research.

Wherever possible, students in the Health Technology training programmes will receive common instruction in order to encourage mutual understanding and foster an atmosphere of harmony between them and other workers in the health field. Further, where practicable, this training will be integrated with that of students in other technological programmes, thus enriching the training of both.

Seven training programmes, open to male or female applicants, are offered in Health Technology. New training programmes, designed to meet the constant changes in the health field, are being developed. Further information on these programmes may be obtained from the Registrar. Details of the present programmes listed below will be found in the succeeding pages:

Biomedical Electronics.
Health Data Processing (not offered in 1969–70).
Medical Isotopes.
Medical Laboratory.
Medical Radiography.
Nursing.
Public Health and Pollution Control.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Biomedical Electronics Programme

In recent years there has been a growing demand for skilled professionals who have been trained in both medicine and engineering. The development of artificial kidneys, hearts, blood vessels, and the many other complicated engineering structures for service in the human body has called for a unique combination of interests and aptitudes on the part of those responsible for their design. The widespread use of medical electronic apparatus for the measurement of blood flow, pulse rate, respiration, nerve activity, and other bodily functions has further increased the demand. This trend will certainly accelerate in the future.

Biomedical engineers are at present graduating from leading North American universities and medical schools. Well-trained technologists working in close association with these professional persons provide essential technological services in the operation and maintenance of scientific medical equipment. They are also called upon to assist in the design and development of new medical electronic and mechanical instrumentation.

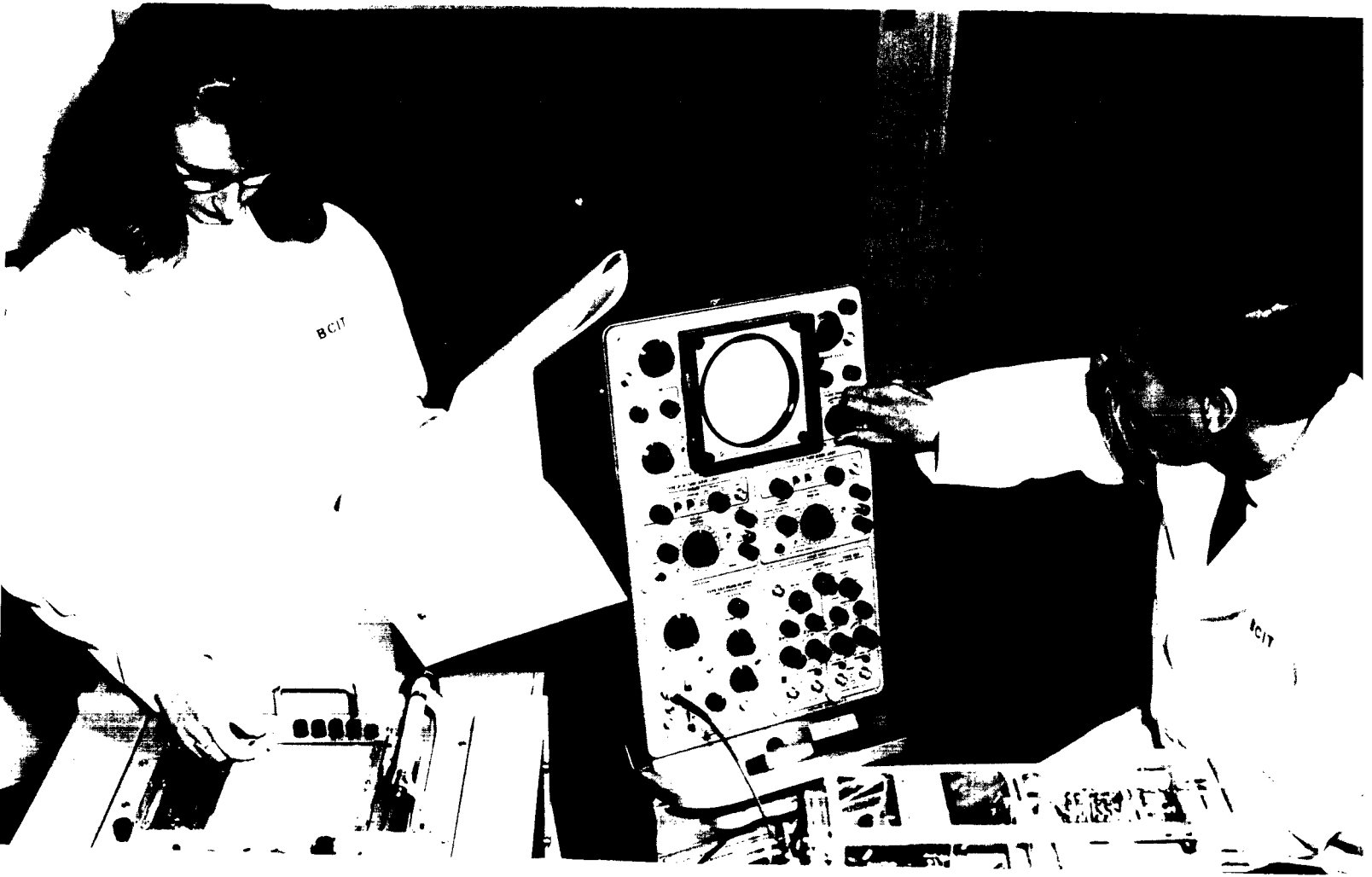
The Biomedical Electronics Programme, a course of two years' duration, provides the education and training for this type of health technologist.

In both years of study the student will learn the fundamentals necessary to the understanding of the medical and technical aspects of the specialty. Mathematics and electronics play a large part in the training, as does detailed study of the processes which take place in the human body.

Many opportunities are open to the graduate with a Diploma of Technology in Biomedical Electronics. Employment will be found in the fields of research, development and production, sales, installation, operation, and servicing. The technologist may work in a hospital, a university, or in a factory. His work and studies bring him into close contact with a wide range of workers in the health field.

Persons wishing to enter this new field of dramatic growth should be interested in the welfare of people and have an aptitude for things mechanical and electrical.

For other programmes in Electronics *see* "Electrical and Electronics Technology."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BCIT

HEALTH TECHNOLOGY

BIOMEDICAL ELECTRONICS PROGRAMME

YEAR 1 — *Term 1*

No.	Subject	Hours per Week Lec.	Lab.
82.103	Human Anatomy and Physiology	2	2
43.102	Electrical Circuits	5	4
32.170	Mathematics (Electronic)	5	4
30.182	General Chemistry for Health Technologists	3	3
31.104	Writing and Contemporary Social Issues	2	1
	Tutorials	----	1
	Library and Research	----	3
		17	18

Term 2

82.202	Human Anatomy and Physiology	2	2
43.202	Electrical Circuits	3	3
43.205	Electronic Circuits	2	2
32.270	Mathematics (Electronic)	5	4
30.282	General Chemistry for Health Technologists	3	3
31.204	Writing and Contemporary Social Issues	2	1
	Library and Research	----	3
		17	18

YEAR 2 — *Term 3*

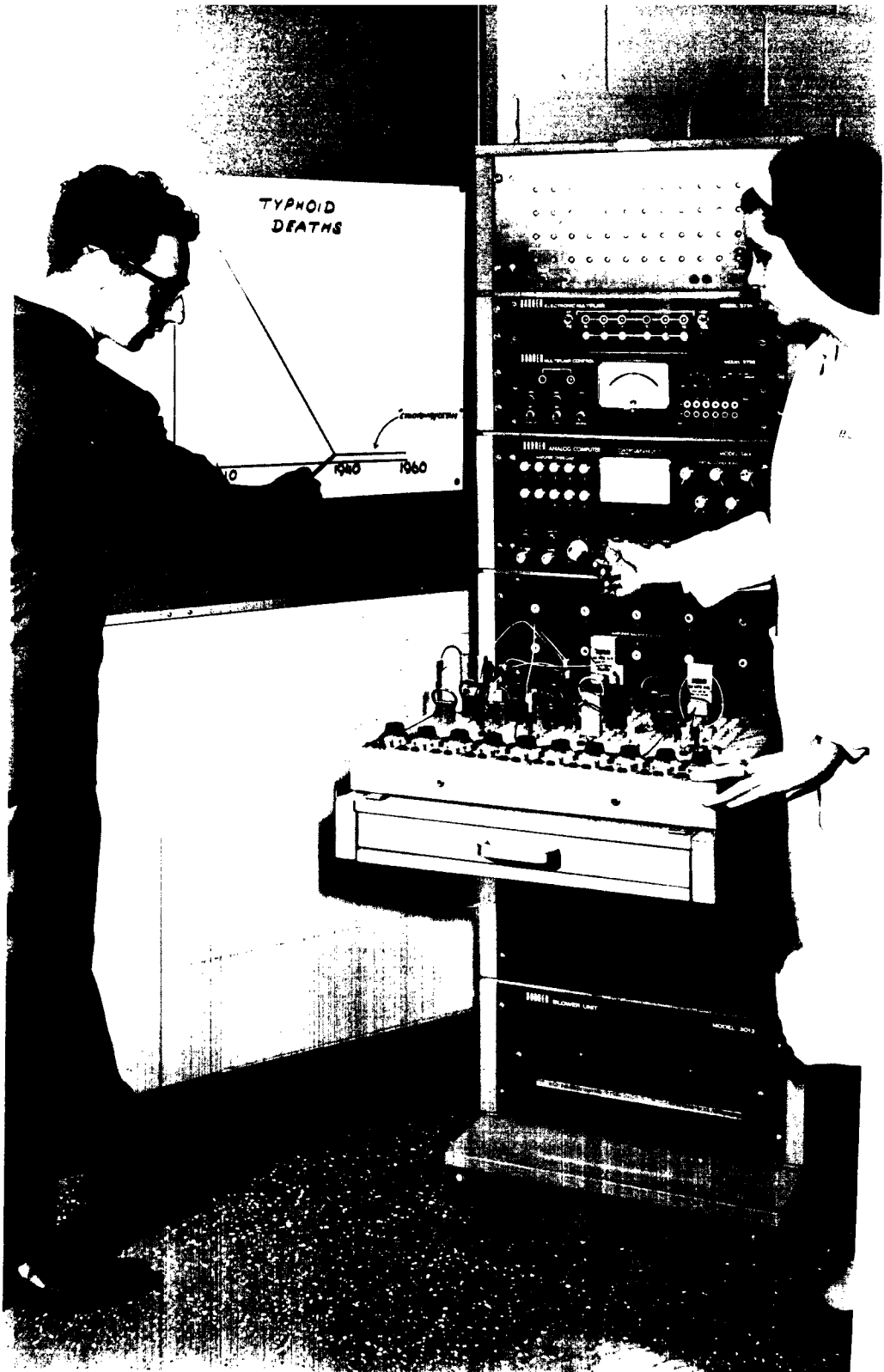
82.316	Biomedical Electronics	1	3
41.309	Medical Materials	1	2
43.303	Measurements, Electrical and Electronics	2	2
32.370	Mathematics (Electronic)	3	2
43.325	Electronic Circuits	3	4
48.350	Medical Instrumentation	1	2
33.330	Biophysics	1*	2*
82.317	Physiology for Biomedical Electronics Students	1*	2*
	Library and Research	----	6
		12	23

Term 4

82.415	Biomedical Electronics	2	6
82.416	Clinical Experience in Biomedical Electronics	----	6
48.460	Medical Instrumentation	----	3
43.433	Digital Techniques	2	6
82.430	Physiology for Biomedical Electronics Students	1*	2*
33.430	Biophysics	1*	2*
82.429	Basic Patient Care	1	----
	Library and Research	----	3
		7	28

* Alternate weeks.

General Prerequisite: Graduation on the Academic-Technical Programme.
Mandatory Prerequisites: Mathematics 12; Chemistry 11; Physics 11.
For other programmes in Electronics *see* " Electrical and Electronics Technology."


TYPHOID
DEATHS
1940
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Health Data Processing Programme
(Not Offered in 1969–70)

Society is becoming increasingly concerned with the need to process efficiently vast quantities of information. In the health field, this is especially true. Information regarding the state of health of the individual and of a community must be collected, arranged into meaningful forms, analysed, and acted upon. To do this requires technologists trained in the procedures of health data processing and capable of communicating in a professional and technical language with other health workers. Many of the processing procedures are at present quite sophisticated. They will become more so in the years ahead. The Health Data Processing Programme is designed to fit the graduate to meet today's demands and those of the foreseeable future. The emergence of new nations and new standards of health open up wide vistas.

The first year of study will provide the student with an understanding of the principles involved in health information processing and a firm grasp of the necessary basic sciences. He will become acquainted with other health technologists and be introduced, by means of indoctrination periods and visits to health facilities in the community, to the health field at large.

In the year following, the accent will be on specialist subjects in which the student will learn those skills necessary to his career. Through affiliation with the Institute, instruction will be given in various health facilities in the Lower Mainland.

Health data may include facts or figures pertaining to births and deaths, communicable diseases, epidemics, and the financing of health programmes, to the physiological functions of a patient, the inner workings of a hospital such as bed occupancy, the efficiency of patient care, or the analysis of the results of surgical and medical procedures.

The successful student with a Diploma of Technology in this specialty can expect to work with equipment as simple as a pencil and paper or as complicated as a computer. He will be qualified to seek employment wherever health data are produced or processed. Such places include hospitals, health and welfare agencies, private clinics, universities, and research establishments. Application will also be found in insurance programmes, especially those related to health services. The field will see some exciting developments in the near future, particularly as they relate to the use of electronic data-processing devices.

The Health Data Processing technologist should be a mathematically minded and methodical person who enjoys working with others and who has a sincere interest in the health of the community.

Health Technology

Medical Isotopes Programme

The advent of the nuclear reactor with its ability to produce artificial radioactive isotopes in quantity has made possible a widely increased use of these materials in medical research, diagnosis, and therapy. This field of medicine, relatively unknown a decade ago, is now on the threshold of major developments. A demand exists for well-educated and properly trained technologists. The British Columbia Institute of Technology offers a two-year course in medical isotope procedures to meet this demand.

Isotopes are the various forms in which a chemical element may occur. They have the same atomic number, but have important physical differences. Some of them are radioactive and emit radiation. This characteristic permits them to be detected and measured by utilizing equipment especially designed for the purpose. They may be introduced into the chemical structure of a large variety of compounds, including biological materials, and investigation of normal and abnormal functions is undertaken by following the isotope through chemical and physical processes in the human body or the laboratory. Radioactive materials are handled in such a way that they constitute no health hazard.

In the first year, the student studies subjects to broaden his general cultural and technological background. These studies prepare him for the specialization to follow. Because of the wide variety of isotope applications and the need for a diversity of capabilities, the programme of studies provides a thorough knowledge of the theoretical principles involved as well as training in the required skills.

During the second year, special subjects relevant to isotope technology are dealt with. The Institute is equipped with an up-to-date radioisotope laboratory. Clinical applications are studied in appropriate facilities in the Lower Mainland hospitals affiliated with the Institute.

On completion of the course, the graduate is granted a Diploma of Technology in Medical Isotopes. Employment will be found in health institutions and also laboratories connected with medicine, agriculture, fisheries, veterinary, and other biological sciences.

Medical isotope technologists should have a liking for work of a technical nature. They must be meticulous in habits and possess a strong sense of responsibility. A desire to be of service to others is essential.

CAUTION
RADIOACTIVE
MATERIAL

HEALTH TECHNOLOGY

MEDICAL ISOTOPES PROGRAMME

YEAR 1 — *Term 1*

No.	Subject	Hours per Week Lec.	Lab.
82.101	Introduction to Behavioural Sciences	---	2
82.102	Basic Medical Microbiology and Epidemiology	2	---
32.182	Mathematics for Health Technologists	3	2
30.182	General Chemistry for Health Technologists	3	3
33.102	Introductory Physics	3	2
82.103	Human Anatomy and Physiology	2	2
32.190	Introduction to Biomedical Data Processing	2	1
	Tutorial	---	2
	Library and Research	---	6
		15	20

Term 2

82.207	Introduction to Behavioural Sciences	---	2
82.201	Basic Medical Microbiology and Epidemiology	---	2
82.202	Human Anatomy and Physiology	2	2
32.282	Mathematics for Health Technologists	3	2
30.282	General Chemistry for Health Technologists	3	3
33.202	Introductory Physics	3	2
33.205	Radioactivity	2	---
82.212	Introduction to Radiation Safety	1	---
82.214	Fundamentals of Patient Care	1	---
82.104	Medical Laboratory Orientation	2	3
	Library and Research	---	2
		17	18

YEAR 2 — *Term 3*

31.104	Writing and Contemporary Social Issues	2	1
82.311	Radiobiology and Protection	1	---
33.305	Measurement of Radioactivity	3	---
82.325	Measurement Techniques in the Isotope Laboratory	---	3
82.326	Applied Physiology in Diagnosis and Therapy	3	3
82.327	Clinical Experience in Diagnostic and Therapeutic Procedures	---	16
82.315	Pathology for Medical Isotope Technologists	1	---
	Tutorial	---	1
	Library and Research	---	1
		10	25

Term 4

31.204	Writing and Contemporary Social Issues	2	1
82.414	Radiobiology and Protection	1	---
82.418	Measurement Techniques in the Isotope Laboratory	---	3
82.426	Applied Physiology in Diagnosis and Therapy	3	3
82.427	Clinical Experience in Diagnostic and Therapeutic Procedures	---	16
82.402	Pathology for Medical Isotope Technologists	1	---
	Library and Research	---	5
		7	28

General Prerequisite: Graduation on the Academic-Technical Programme.
Special Prerequisites: Mathematics 12; Chemistry 12; two Science 11's.

CIT

Health Technology

Medical Laboratory Programme

The medical laboratory technologist, as a member of the health team, performs the many and varied laboratory procedures the results of which are used by physicians as important aids to the diagnosis and treatment of the patient.

Laboratory screening programmes 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 laboratory procedures and the rising demand generally for health services assure a wide range of opportunities for employment.

Medical Laboratory Technology offers a variety of scientific pursuits within the modern hospital, the private clinical laboratory, and the research laboratory. These fields include histopathology, clinical chemistry, hæmatology, microbiology, and immuno-hæmatology. The trained technologist may pursue any one or a combination of these fields after completion of training.

Applicants should have a strong interest in science and be meticulous in their work and habits.

At the present time there are two plans for the training of medical laboratory technologists at the British Columbia Institute of Technology. Both lead to graduation and the same Diploma of Technology.

The Canadian Society of Laboratory Technologists requires graduates of both Plans I and II to complete a further year of practical training in a hospital laboratory approved by the Canadian Medical Association to be eligible to sit the society's general certification examination. During this year the graduate receives a salary.

Plan I

Under this plan, students spend two years at the Institute. Applicants must have graduated on the Academic and Technical Programme or the equivalent with the following special prerequisites: Mathematics 12, and credit in three sciences, one of which must be a 12. Chemistry 12 is strongly recommended.

Plan II

As an interim measure, applicants may be accepted into the second year of the Institute programme provided they hold the following prerequisites: Senior Matriculation or the equivalent, with credits in mathematics, English, chemistry, a second science, and one other subject. Students accepted under this plan may be required to attend a special two-week course at the Institute prior to the start of the academic year. Applicants may obtain further information regarding Plan II from the Registrar.

HEALTH TECHNOLOGY

MEDICAL LABORATORY PROGRAMME

YEAR 1 *Term 1*

No.	Subject	Hours per Week Lec.	Lab.
82.101	Introduction to Behavioural Sciences	....	2
32.182	Mathematics for Health Technologists	3	2
31.104	Writing and Contemporary Social Issues	2	1
30.182	General Chemistry for Health Technologists	3	3
33.102	Introductory Physics	3	2
82.103	Human Anatomy and Physiology	2	2
32.190	Introduction to Biomedical Data Processing	2	1
	Tutorials	....	2
	Library and Research	....	5
		15	20

Term 2

82.207	Introduction to Behavioural Sciences	....	2
32.282	Mathematics for Health Technologists	3	2
31.204	Writing and Contemporary Social Issues	2	1
30.282	General Chemistry for Health Technologists	3	3
33.202	Introductory Physics	3	2
82.202	Human Anatomy and Physiology	2	2
82.104	Medical Laboratory Orientation	2	3
	Library and Research	....	5
		15	20

YEAR 2 *Term 3*

82.314	Medical Microbiology and Parasitology	3	6
82.313	Biochemistry and Physiology for Medical Laboratory Technologists	2	....
82.303	Instrumentation in Clinical Chemistry	3	5
82.308	Hæmatology	2	2
82.302	Histology	2	4
82.312	Introductory Principles of Immunology	1	....
	Library and Research	....	5
		13	22

Term 4

82.409	Medical Microbiology and Parasitology	3	6
82.406	Clinical Chemistry	3	6
82.412	Hæmatology	2	3
82.408	Blood Banking	2	6
	Library and Research	....	4
		10	25

General Prerequisite: Graduation on the Academic-Technical Programme.
Mandatory Prerequisites: Mathematics 12; Chemistry 11; one other Science 11.

Medical Radiography (X-ray) Programme

Medical radiography has been defined as "the art of recording on a sensitized film an image of the inner structures of the human organism." The chief concerns of the X-ray technician are the taking of X-rays and providing assistance to the radiologist during the various X-ray procedures. Workers in this field must be interested in the welfare of others and possess a strong sense of responsibility.

Advances in science and technology are greatly influencing medical radiography. The course offered is intended to qualify radiographers who will be in step with the latest developments in patient care. Medical radiographers are essential members of the health team.

It is emphasized that this occupation is not considered to present any hazard to health. The dangers of radiation are well recognized and rigidly controlled.

Training includes considerable contact with other students in the Health Technology programmes. During the first year, general studies chosen and organized with reference to their usefulness to the student as a health technologist are presented. At the same time there are included several courses which relate directly to the study of Medical Radiography. There is a period of orientation spent in the affiliating hospitals.

In the second year, emphasis is placed solely on the subjects related to the specialty. During this time, students gain experience in the clinical application of medical radiography in hospitals affiliated with the Institute. While at the hospital the student is under the supervision of the Institute instructional staff. Considerable laboratory work is a feature of both years.

The Canadian Society of Radiological Technicians requires graduates to complete a further year of practical training in a hospital X-ray department, approved by the Canadian Medical Association, to be eligible to sit the society's certification examination. During this year the graduate receives a salary.

Certification resulting from this programme is recognized and accepted in all Provinces, the United States, Great Britain, Australasia, and many other countries.

Registered technicians may expect to be employed in hospitals and private X-ray clinics. There are also opportunities for men in the sales divisions of X-ray equipment and film companies.

HEALTH TECHNOLOGY

MEDICAL RADIOGRAPHY PROGRAMME

YEAR 1 *Term 1*

No.	Subject	Hours per Week Lec.	Lab.
82.101	Introduction to Behavioural Sciences	----	2
82.102	Basic Medical Microbiology and Epidemiology	2	----
32.182	Mathematics for Health Technologists	3	2
82.112	Physiological Chemistry	3	----
33.102	Introductory Physics	3	2
82.103	Human Anatomy and Physiology	2	2
82.106	Introduction to Radiography	3	----
31.104	Writing and Contemporary Social Issues	2	1
82.114	Apparatus and Image Recording	2	2*
	Tutorial	----	1
	Library and Research	----	4
		20	15

Term 2

82.207	Introduction to Behavioural Sciences	----	2
82.201	Basic Medical Microbiology and Epidemiology	----	2
82.215	Anatomy and Physiology for Radiographers	3	1
32.282	Mathematics for Health Technologists	3	2
33.202	Introductory Physics	3	2
82.203	Basic Medical Radiography	2	3†
82.216	Apparatus and Image Recording	2	3†
31.204	Writing and Contemporary Social Issues	2	1
82.217	Clinical Experience in Basic Medical Radiography	----	4
82.214	Fundamentals of Patient Care	1	----
	Library and Research	----	2
		16	19

YEAR 2 *Term 3*

33.303	Physics of Medical Radiography	3	3
82.309	Medical Radiography	2	3
82.307	X-ray Apparatus and Image Recording	2	3
82.311	Radiobiology and Protection	1	----
82.304	Clinical Experience in Medical Radiography	----	16
	Library and Research	----	2
		8	27

Term 4

82.413	Medical Radiography	1	3
82.414	Radiobiology and Protection	1	----
82.411	X-ray Apparatus and Image Recording	2	3
82.401	Pathology for Medical Radiographers	2	----
82.407	Clinical Experience in Medical Radiography	----	24
		6	30

* Every second week.
† Every third week 82.203 is given in place of 82.216.

General Prerequisite: Graduation on the Academic-Technical Programme.
Mandatory Prerequisites: Mathematics 12; one Science 12 and two Science 11's.

Nursing Programme

The Nursing Programme offers a student a two-year course of studies and hospital experience which leads to graduation as a qualified nurse and the eligibility to write the professional nursing examinations in order to obtain an R.N. The programme is open to men and women, and neither age nor marital status are primary factors in the selection of candidates. It is preferred that the nursing student has had biology and some chemistry in high school. A physical examination is required prior to entry in the Nursing Programme.

The curriculum for nursing students includes biological, pure, social, and applied sciences. Nursing is taught throughout the two years, and clinical experience, with the guidance of Institute instructors, is provided concurrently at nearby hospitals and health agencies. During the first year a number of basic subjects are taken with the other Health Technology students. Summer practicums provide additional clinical practice over and above that which is arranged during the four terms.

The nursing courses include study and experience in basic nursing, psychiatric nursing, family care nursing, and medical-surgical nursing. Specific knowledge and skills in areas such as pharmacology, dietetics, and rehabilitation are integrated throughout the curriculum. Modern trends in interpersonal communication and advanced hospital equipment are reflected in the curriculum.

Successful candidates in the Nursing Programme will be well equipped to work as beginning practitioners in hospitals and analogous situations in the community.

FIRST FLOOR

HEALTH TECHNOLOGY

NURSING PROGRAMME

YEAR 1 — *Term 1*

No.	Subject	Hours per Week Lec.	Lab.
82.108	Introduction to Nursing	3	2
82.109	Introductory Clinical Experience in Nursing		8
82.101	Introduction to Behavioural Sciences		2
82.103	Human Anatomy and Physiology	2	2
82.102	Basic Medical Microbiology and Epidemiology	2	
82.112	Basic Physiological Chemistry	2	
82.110	Pharmacology	1	1
82.111	Interpersonal Relations for Nursing		1
31.104	Writing and Contemporary Social Issues	2	1
	Library and Research		6
		12	23

Term 2

82.205	Basic Nursing	3	2
82.206	Clinical Experience in Basic Nursing		8
82.207	Introduction to Behavioural Sciences		2
82.202	Human Anatomy and Physiology	2	2
82.201	Basic Microbiology and Epidemiology		2
33.203	Basic Medical Physics	2	
82.208	Pharmacology	2	
82.209	Interpersonal Relations for Nursing		2
82.210	Human Growth and Development	2	
82.211	Pathology and Pathophysiology	2	
31.204	Writing and Contemporary Social Issues	2	1
	Library and Research		1
		15	20
82.218	Summer Term Practicum (11 weeks)		40

YEAR 2 — *Fall Term (12 Weeks)*

82.320	Medical-Surgical Nursing, Acute	9	
82.321	Clinical Experience in Medical-Surgical Nursing, Acute		18
82.425	Clinical Experience in Psychiatric Nursing		
82.424	Psychiatric Nursing	2	
82.324	Professional Nursing	1	
	Library and Research		5
		12	23

Winter Term (12 Weeks)

82.420	Medical-Surgical Nursing, Long Term	9	
82.421	Clinical Experience in Medical-Surgical Nursing, Long Term		18
82.425	Clinical Experience in Psychiatric Nursing		
82.424	Psychiatric Nursing	2	
82.324	Professional Nursing	1	
	Library and Research		5
		12	23

Spring Term (12 Weeks)

82.322	Family Care Nursing	9	
82.323	Clinical Experience in Family Care Nursing		18
82.425	Clinical Experience in Psychiatric Nursing		
82.424	Psychiatric Nursing	2	
82.324	Professional Nursing	1	
	Library and Research		5
		12	23

Summer Term (12 Weeks)

82.431	Summer Term Practicum (11 weeks)		40

General Prerequisite: Graduation on the Academic-Technical Programme.
Mandatory Prerequisite: One Science 12.

Health Technology

Public Health and Pollution Control Programme

PUBLIC HEALTH INSPECTOR TRAINING

Modern society is presenting problems in increasing number and magnitude which influence the health of the people. Within the broad field of health, it is the concern of the public health technologist to measure and control those problems in the community which are associated with environmental hazards. Historically, inspection and control have been an important aspect of public health. Responsibility, once confined to infectious disease and the more common environmental hazards, has now extended to the hazards of pollution of air, land, and water and the many toxic and safety hazards which arise in industrial, agricultural, and urban society. Public accommodation and recreation, community planning, and food processing and control are also major areas of concern.

To meet the changes in this field and the demand for highly skilled technologists, the Public Health and Pollution Control Programme offers a balanced curriculum of lecture, laboratory, and field experience which provides the graduate with a thorough knowledge of environmental hazards and their effect on human individuals and populations. The graduate will be able to couple his technical skills with human needs and requirements. A large portion of his studies is taken in conjunction with that of other health workers and technologists of a wide range of industries.

A graduate, in addition to qualifying for a Diploma of Technology, will be prepared to write the national examinations to qualify for a Certificate in Public Health Inspection (Canada).

Employment will be found in official and private health agencies, in industry, and with specialized agencies interested in pollution control, food sanitation, and public health on a local, national, and international level.

HEALTH TECHNOLOGY

PUBLIC HEALTH AND POLLUTION CONTROL PROGRAMME

YEAR 1 — *Term 1*

No.	Subject	Hours per Week Lec.	Lab.
82.102	Basic Medical Microbiology and Epidemiology	2	---
32.182	Mathematics for Health Technologists	3	2
31.101	Writing in a Technical Context	2	1
30.182	General Chemistry for Health Technologists	3	3
33.102	Introductory Physics	3	2
82.103	Human Anatomy and Physiology	2	2
82.105	Food Sanitation	4	---
	Tutorial	---	1
	Library and Research	---	5
		19	16

Term 2

82.201	Basic Medical Microbiology and Epidemiology	2	---
32.282	Mathematics for Health Technologists	3	2
31.201	Writing in a Technical Context	2	1
30.282	General Chemistry for Health Technologists	3	3
33.202	Introductory Physics	3	2
82.202	Human Anatomy and Physiology	2	2
82.204	Food Sanitation	1	3
92.211	English Speech	---	2
	Library and Research	---	4
		16	19

YEAR 2 — *Term 3*

90.322	Human Relations	2	1
31.301	Writing in a Technical Context	1	1
90.390	Work Study	1	2
90.362	Public Health Law	2	1
82.306	Public Health Administration	1	1
82.301	Environmental Health and Engineering	8	8
32.290	Computer Applications	2	---
	Library and Research	---	4
		17	28

Term 4

90.424	Personnel Administration	2	2
31.401	Writing in a Technical Context	1	1
82.410	Public Health Administration	1	2
82.404	Environmental Health and Engineering	8	8
82.419	Communicable Disease Control	3	1
32.390	Computer Applications	2	---
	Library and Research	---	4
		17	28

General Prerequisite: Graduation on the Academic-Technical Programme.
Mandatory Prerequisites: Mathematics 12 and two Science 11's.

ACKNOWLEDGMENTS

Grateful acknowledgment is made to the following persons and organizations for photographs used in this publication:

British Columbia Hydro and Power Authority.

Division of Technical and Vocational Curriculum, Technical Branch, Department of Education.

Visual Education Department, Vancouver School Board.

British Columbia Department of Highways.

Greater Vancouver Water Board.

SUBJECT SUMMARIES

SUBJECT NUMBERING SYSTEM

Subjects are numbered to indicate the technology or department under which instruction is given, the term, and the subject material. The first two figures indicate the parent technology or department, the third figure indicates the term in which a subject is normally taught, the last two figures indicate the subject description. In the example 31.201, the "31" shows that the subject is offered by the English Department, the "2" shows that the subject is normally taught in the second term, the "01" stands for the subject description. The departments and technologies with their corresponding numbers are as follows:

30—Chemistry.
31—English.
32—Mathematics.
33—Physics.
40—Building.
41—Chemical and Metallurgical.
42—Civil and Structural.
43—Electrical and Electronics.
44—Food.
45—Forestry.
46—Forest Products.
47—Natural Gas and Petroleum.
48—Instrumentation.
49—Mechanical.
50—Mining.
51—Surveying.
82—Health Technology.
90—Business Management.
91—Broadcast Communications.
92—Hotel, Motel and Restaurant Management.

CHEMISTRY

30.101, 30.201 General Chemistry

The material presented in this course includes fundamental principles of inorganic, physical, and organic chemistry.

During the first part of the course the following topics will be presented: atomic structure; periodicity; bonding; practical problem solving; applications of the gas laws; liquids, solids, and changes of state; solution chemistry; colloids; chemical kinetics and equilibrium; ionic equilibrium; electrochemistry; periodic table trends and descriptive chemistry of representative elements.

The latter part of the course will include the properties and major reactions of the following classes of organic compounds: alkanes; alkenes; alkynes; simple aromatic compounds; alcohols; ethers; aldehydes; ketones; carboxylic acids, amines, amino acids, and carbohydrates.

Laboratory work consists of qualitative analysis of common anions and cations; gravimetric analysis of simple industrial materials; volumetric analysis (acid-base and oxidation-reduction) of natural compounds; and basic organic techniques and preparations.

30.182, 30.282 General Chemistry

A general course in which inorganic and physical chemistry (Part A) and organic and biochemistry (Part B) are presented concurrently. Part A comprises two-thirds of the lecture periods in Term 1 and one-third in Term 2.

Topics presented in Part A include atomic theory and the periodic table; bonding; chemical formulæ and equations; the gas laws, properties of solutions; distillation; equilibrium; properties of acids and bases; kinetics; electrochemistry; and nuclear chemistry.

In Part B the properties and some of the reactions of the major classes of organic compounds are described with an introduction to reaction mechanisms. A selection of biochemical material is presented which includes carbohydrate and fat metabolism; properties of amino acids and their metabolism; properties of proteins and their synthesis; enzyme action; and metabolic effects of hormones, pesticides, and herbicides.

The laboratory work consists of quantitative inorganic analysis, organic synthesis, properties of biological materials, physical methods of their analysis, and enzyme reactions.

30.201 *See* 30.101.

30.202 General Chemistry

Basic chemical concepts are stressed to develop an understanding of simple reactions, oxidation-reduction, bonding, periodic trends in chemical properties, solids and liquids, pH, ionic equilibria, and electrochemistry.

The laboratory work is designed to illustrate and complement the lecture material. Typical chemical reactions and properties of common compounds are systematically examined in qualitative analysis. Simple gravimetric and volumetric analysis exemplifies stoichiometric reactions and calculations, while chromatography and ion exchange methods demonstrate more modern techniques. Corrosion processes are examined with emphasis on control and prevention in the industrial situation.

30.204, 30.304 Chemical Laboratory Techniques

This course teaches basic techniques in sampling, weighing, moisture determinations, ashing, extractions, filtration gravimetric methods, volumetric methods; instrumental analysis and separation methods will be described, demonstrated, and whenever possible, practised.

30.282 *See* 30.182.

30.301, 30.401 Organic Chemistry

A general course in organic chemistry in which the properties and reactions of all major classes of organic compounds are described: aliphatic and aromatic hydrocarbons, alcohols, acids, phenols, aldehydes; ketones, amines, amides, amino acids, sulphur compounds, carbohydrates, heterocyclic compounds, dyes and polymers. Reaction mechanisms are introduced where these are of value in assisting the student to organize the material.

Laboratory work consists of syntheses of organic compounds, using some of the more important reactions described in the lectures, qualitative chemical analysis, and some physical methods of analysis.

30.302 Physical Chemistry

The course presents the kinetic theory of gases, the first and second laws of thermodynamics, the study of crystals by X-ray diffraction, the phase rule, chemical kinetics, and catalysis. Laboratory work consolidates lecture material and gives experience in practical physical chemical measurements.

30.303 Instrumental Analytical Methods

This course introduces basic theoretical concepts, instrument construction and operation, and general applications of the following methods: measurement of pH; potentiometry; polarography; spectrophotometry (including visible, ultraviolet, infra-red, and atomic absorption); flame photometry; refractometry and polarimetry; solvent extraction; column, paper, and thin layer chromatography, gas chromatography; ion exchange resins; and basic radioisotope counting techniques.

30.304 *See* 30.204.

30.305, 30.405 Chemical Instrumentation

This course presents the basic instrument components, their characteristics, and their modular construction in analytical instrumentation. The emphasis is on signal flow and the information represented by the same. Basic design patterns, as well as practical aspects of servicing, are presented with references to pH meters, polarographs, titrators, spectrophotometers, gas chromatographs, rate meters and scalers, chemical signal sources, electrical components, operational amplifiers as multipliers, subtractors, function generators, and servo-systems.

Laboratory work consists of examination of components and construction of basic instruments described in the lectures.

30.401 *See* 30.301.

30.404 Organic 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: paraffins, olefins, alkynes, aromatic hydrocarbons, sulphur compounds, and heterocyclic compounds. The chemistry of the refining processes and of the production of some petrochemicals is presented.

In the laboratory the student will use some of the reactions described in the lectures and will carry out some analyses of petrochemicals using physical and chemical methods.

ENGLISH

31.101, 31.201 Writing in a Technical Context

The improvement of the student's ability to communicate is the main aim of the course. Types of writing appropriate to the student's present and future needs are discussed and practised, including various forms of technical and business writing. Some current issues related to our technological society are examined to provide the students with practice in understanding complex issues. Differing points of view and their supporting evidence are studied, and the student is encouraged to evaluate their relative merits. The course is unified by a continuing concern with the logic and structure of all types of communications.

31.102, 31.202 Business Writing and Contemporary Thought

The course will consist of two parts. Part A comprises a study of the applications of the basic principles of composition, semantics, and social psychology to the writing of business letters and reports. Part B is concerned with the analysis of some major problems of the 20th century as they are presented in modern literature, with particular emphasis on the social consequences of science and technology.

31.103, 31.203 Writing and Modern Literature

The course consists of a study of some representative modern fiction and drama, with the intention of developing in the student some understanding of the methods and aims of writers.

31.104, 31.204 Writing and Contemporary Social Issues

The first part of this course consists of studies in communications theory, including semantics, logic, and persuasion, and applications of these topics to the writing of reports. The second part is based on the study of selected social issues, with emphasis on individual and group interaction. Such themes as alienation, urbanization, and integration, as they are presented in literature, will be discussed.

31.201 *See* 31.101.

31.202 *See* 31.102.

31.301, 31.401 Writing in a Technical Context

This course has the same aim, and uses the same approach, as the first-year course. The study of problems in the selection, arrangement, and presentation of data is continued at a more advanced level. Much of the work involves technical data from the student's own field of study, and concepts relating to the social context of technology.

31.302, 31.402 Business Communications

In this course, students will continue the work of the first year, with emphasis on communication theory, and on practical problems in the interpretation, evaluation, organization, and presentation of data, in both written and spoken form.

31.303, 31.403 Writing and the Mass Media

The course will consist of two parts. Part A comprises brief examinations of the history of English, the relations between language and culture, semantics, the methods of argument and persuasion, and the application of the preceding material to the writing of letters, reports, and scripts. Part B consists of studies in the development, nature, effects, and uses of the media of mass communication.

31.401 *See* 31.301.

31.402 *See* 31.302.

31.403 *See* 31.303.

In addition to these credit courses, the English Department also offers the following course (31.904) in reading improvement for students having difficulties. This course is intended to help students cope with the heavy work load at the Institute by improving their reading efficiency, and is voluntary.

31.904 Reading Improvement

This course emphasizes reading rate, comprehension, previewing, skimming and scanning, reading skills in professional and special interest areas, study habits and skills. Classes will meet for 2 hours each week for at least 10 weeks. Each class is limited to 15 persons for emphasis on individual attention. This course is not intended for persons for whom English is a second language.

MATHEMATICS

32.ABC Mathematics for the Technologies (Except Electrical and Electronics, Broadcast Communications, and Health Technologies).

(NOTE.—The order in which the following units of study are scheduled in a particular technology programme is indicated by the subject number 32.ABC, where A is the term number and B and C are the unit numbers associated with that term (e.g., 32.436 indicates a mathematics course running in Term 4 and consisting of Units 3 and 6).)

Unit 0

An introductory course in computational techniques involving basic ideas in flow-charting and programming with the use of the computer.

Unit 1

Topics in algebra and trigonometry, with technical applications, prerequisite for the courses described in Units 2 to 6.

Unit 2

An introductory course in calculus and its applications involving the differentiation and integration of algebraic, trigonometric, logarithmic, and exponential functions.

Unit 3

Further calculus topics and applications; conics and calculus problems associated with these; power series; partial differentiation; differential equations.

Unit 4

An introduction to statistics. Organization and presentation of data; measures of central tendency and dispersion; frequency distributions; sampling; estimation; hypothesis testing; regression.

Unit 5

Elementary numerical methods in theory and practice; iterative methods in the solution of algebraic and transcendental equations; finite differences; interpolation; numerical differentiation and integration; numerical solution of simple differential equations.

Unit 6

Further topics of special importance in the student's chosen technology, selected from applied analytic geometry, spherical trigonometry, further statistics, further differential equations, Boolean algebra, linear algebra, further numerical methods.

32.170, 32.270, 32.370 Mathematics for Electrical and Electronics, Broadcast Communications (Technical Option), and Health (Biomedical Electronics Option) Technologies.

32.170

This course deals with the theory and application in the electrical and electronic fields of the following areas of study: Trigonometry, with emphasis on wave-forms, vectors, and use of identities; complex numbers and their use in a.c. circuit calculations; logarithmic and exponential functions, with application to transient and power problems; linear equations, matrices and determinants, with application to mesh circuits analysis.

32.270

A course in calculus dealing with the following topics, with applications throughout in the electrical and electronics fields: The differentiation and integration of algebraic, trigonometric, logarithmic, exponential, and hyperbolic functions; power series; partial differentiation; differential equations of the first and second order.

This course will include a short course on computing techniques involving basic ideas in flow-charting and programming with the use of the computer.

32.370

Laplace transforms; transform pairs of functions and operations, inverse transforms, applications to circuits involving integro-differential equations, the transfer function, pole-zero configurations. Matrix algebra; use of determinants in mesh and model analysis, simple matrix operations and their application in four-terminal networks. Fourier series; trigonometric form of Fourier expansion, analysis of various wave-forms.

32.182, 32.282, 32.290, 32.390 Mathematics for Health Technology (Except Biomedical Electronics and Nursing Options).

32.182

This course, together with 32.282, is designed to provide Health Technology students with a good understanding of the mathematical principles and practices used in their various fields of work.

Exponents and logarithms (common and natural); logarithmic and exponential equations, log-log and semi-log graphs.

Introduction to calculus. The derivative and its applications; the integral and its applications.

Special topics. Applications especially suited to specific branches of Health Technology.

32.282

Descriptive statistics—organization and graphical presentation of data: measures of location, variation, skewness, and kurtosis.

Probability, theoretical frequency distributions, sampling and sampling distributions.

Inference statistics—estimation, hypothesis testing, chi-square, non-parametric methods, analysis of variance, quality control.

Correlation and regression.

Special topics.

32.190

An introductory course using the I.B.M. S 360 computer as a tool for problem-solving. The course includes an introduction to PL/I as a programming language to solve simple problems, and the use of library programmes for more complex problems.

32.290

An introductory course in computing, involving the use of the I.B.M. 360 computing system, and with applications in the Health Technology field. Some subsidiary topics in mathematics, additional to those in Courses 32.182 and 32.282, will be presented.

32.390

An extension of 32.290, with emphasis on the use of a computer for problem-solving in the health field. An introduction to data-based systems and information retrieval.

PHYSICS

33.101, 33.201 General Physics

This course is designed to provide the background knowledge required in the Chemical and Metallurgical, Natural Gas and Petroleum, and Mining Technologies. Consequently it covers the main fields of physics—kinematics, dynamics (Newton's laws of motion), friction, statics, angular motion, energy, momentum, simple machines, structure and properties of matter, fluid mechanics, temperature and heat, thermal properties of matter (expansion of solids and gases), thermodynamics, heat transfer, d.c. circuits, electromagnetism, a.c. circuits, wave motion and sound, electromagnetic waves, geometrical and wave optics, relativity and quantum mechanics, atomic and nuclear phenomena. The mathematical treatment requires only algebra and trigonometry, although the use of calculus may occur near the end of the second term. Considerable emphasis is placed on laboratory work, which will include topics in geophysical prospecting for the Natural Gas and Petroleum, and Mining Technologies.

Prerequisite: Thorough grounding in senior secondary-school physics is presumed. Physics 11 in British Columbia is the minimal requirement.

Text: A. Beiser, *Modern Technical Physics,* Addison-Wesley, 1966.

33.102, 33.202 Introductory Physics

This course covers, at a somewhat lower level, approximately the same material as Physics 33.101, 33.201. The course is designed for those process and medical technologies for which secondary-school physics is not a prerequisite. Considerable emphasis is placed on laboratory work. Mathematical treatment demands only basic algebra and trigonometry.

Text: A. Beiser, *The Mainstream of Physics,* Addison-Wesley, 1963.

33.104, 33.204 Physics for Building Technology (D)

This course is designed to satisfy the background knowledge required in the Building Technology and consequently covers elementary aspects of the main fields of physics—structure and properties of matter, statics, kinematics, Newton's laws of motion, angular motion, fluids, sound, calorimetry, thermal behaviour of gases, thermodynamics, electromagnetism, a.c. and d.c. circuits, introduction to optics, atomic and nuclear phenomena. Mathematical treatment requires only algebra and trigonometry, although calculus may be introduced near the end of the second term. Considerable emphasis is placed on problem-solving and suitable applications in the field of Building Technology.

Prerequisite: Thorough grounding in senior secondary-school physics is presumed. Physics 11 in British Columbia is the minimal requirement.

Text: A. Beiser, *Modern Technical Physics,* Addison-Wesley, 1966.

33.106, 33.206 General Physics (B)

This course is similar to 33.101/201, General Physics (A), except that subject-matter related to the Broadcast (Technical), Electrical and Electronics, and Instrumentation Technologies is emphasized. A section on the physics of electron emission and semi-conductor behaviour is included.

Prerequisite: As in 33.101/201.

Text: As in 33.101/201.

33.107, 33.207 General Physics (C)

This course is designed to satisfy the background knowledge required in Civil and Structural, Mechanical, and Surveying Technologies and covers elementary aspects of the main fields of physics—structure and properties of matter, statics, kinematics, Newton's laws of motion, angular motion, fluids, sound, calorimetry, thermal behaviour of gases, thermodynamics, electromagnetism, d.c. circuits, brief treatment of simple a.c. circuits, applied electricity, geometrical optics, wave optics, applied optics, atomic and nuclear phenomena. Mathematical treatment requires only algebra and trigonometry, although calculus may be introduced near the end of the second term. Considerable emphasis is placed on laboratory work.

Prerequisite: Thorough grounding in senior secondary-school physics is presumed. Physics 11 in British Columbia is the minimal requirement.

Text: A. Beiser, *Modern Technical Physics,* Addison-Wesley, 1966.

33.201 *See* 33.101.

33.202 *See* 33.102.

33.203 Basic Medical Physics

This course is designed especially for students in the nursing programme. The course is a descriptive rather than a quantitative treatment of the elements of general physics, and dwells in some measure on practical examples of physical principles as found in the field of medicine. There is no labora-

tory programme associated with the course, but extensive use is made of demonstration experiments during the lectures.

Text: C. E. Bennett, *Physics without Mathematics,* Barnes and Noble, 1960.

32.204 *See* 33.104.

33.205 Radioactivity

This course is designed for students in the Medical Isotope Programme. Physics 33.202 is presumed to be taken concurrently. The course involves a quantitative, rather than a descriptive, approach to those elements of physics bearing directly upon radioactivity and radiation phenomena, atomic structure, X-rays, early experiments in radioactivity, radioactive change and successive radioactive transformations, half life, some key nuclear reactions, the energetics of nuclear change, the interaction of radiation with matter, production of radioisotopes.

Prerequisite: Physics 33.202.

Texts: E. H. Quimby and S. Feitelberg, *Radioactive Isotopes in Medicine and Biology.*

33.206 *See* 33.106.

33.207 *See* 33.107.

33.303 The Physics of Medical Radiography

This course is designed for diagnostic X-ray technicians. The course deals with the elements of electricity and modern physics as they apply specifically to medical radiography. Among the topics included are the structure of matter, static electricity, direct-current electricity, magnetism, induced currents, pulsating and alternating currents, X-ray and other tubes, X-rays and their nature and production, interaction of X-rays with matter.

Prerequisite: Physics 33.102 and 33.202.

Text: A. Ridgway and W. Thumm, *The Physics of Medical Radiography,* Addison-Wesley, 1968.

33.304 Geophysical Prospecting Methods

This course will stress points of particular interest to those engaged in exploring and developing mineral bodies. It will build on the special lectures and laboratory work given in Physics 33.101/201 to students in the Mining Technology (radioactivity, magnetic and electrical prospecting methods).

Topics dealt with in 33.304 will be mainly induced polarization, INPUT method, electromagnetic methods, seismic and gravity methods as applied in mineral exploration.

Prerequisite: Physics 33.201.

33.305 The Measurement of Radioactivity

This course is a continuation of Physics 33.205 in that it concerns itself with the methods of detecting radiation discussed in 33.205. The following topics are considered: Statistics of measurement; determinate errors in radioactivity measurement, such as geometry, scattering and absorption; radiation detectors and instruments—ionization chambers, Geiger-Muller counters, proportional counters, scintillation detectors, systems for data accumulation and presentation; basic measurements, such as survey instruments, radioisotope scanning, multi-hole collimators, positron scanning, coincidence counting.

Prerequisite: Physics 33.102, 33.202, 33.205.

Texts: E. Quimby and S. Feitelberg, *Radioactive Isotopes in Medicine and Biology.*

33.330, 33.430 Biophysics

A study of biophysics with particular reference to the needs of the biomedical electronics technologist. The course will cover mechanics, electricity, magnetism, waves, and heat. The emphasis in lectures, seminars, and projects will be on basic physics as applied to biological systems.

Prerequisite: The lecture development will assume a knowledge of secondary-school physics. Physics 11 in British Columbia.

BUILDING

40.101, 40.201 Design and Draughting

Fundamentals of design, æsthetic and functional; design of utilitarian objects; architectural design principles.

Advanced draughting; lettering; isometric; perspective; presentation techniques, sketching; colour; model building; simple architectural design.

40.102, 40.202 Building Construction

Principles of building construction in terms of the assembly of materials; examination of typical systems of wood and masonry construction; preliminary introduction to characteristics of materials; study of architectural detailing.

Application of the above to the preparation of working drawings, in coordination with courses in Building Structures and Building Services. Trips to building sites and plants.

40.103, 40.203 Building Services

Introduction to building services complex; water supply; waste disposal; heating; electrical illumination. Emphasis on fundamentals and interrelation of services.

Preparation of working drawings for mechanical and electrical systems. Field trips.

40.104 Building Regulations

Origins and purposes of building regulations; typical zoning by-laws and building by-laws. National Building Code; other Acts, codes, by-laws, and regulations related to buildings.

Aspects of common law and law of contract related to building premises.

40.107 Building Structures

Historical development and relation to structural design; vectors and force systems; graphical representation; resultants and components; moments and couples; conditions of equilibrium; force polygon; funicular polygon; co-planar systems; three-dimensional systems; frames and trusses; stress diagram and Bowes notation; chains and cables; vertical shear force and bending moment diagrams; related problems and experiments with emphasis on building structures, retaining walls.

40.201 *See* 40.101.

40.202 *See* 40.102.

40.203 *See* 40.103.

40.207 Building Structures

Historical development of structural systems; contemporary structures; principles of structural design; discussion of structural materials and their properties.

Assumptions of loading and types of loading; stress, strain, and elasticity; simple stresses; temperature stresses; composite material and resultant stresses; yield; factors of safety and load factors.

Properties of sections, bending moments, and shear forces; theory of flexure; slope and deflection of beams; restrained and continuous beams.

Axially loaded columns; tension and compression members; connections.

Introduction to soils, foundations, piling, and retaining walls.

40.301, 40.401 Design

Short history of architecture and building, particularly since the Industrial Revolution; contemporary architectural masterpieces, with analysis of their planning, structure, services, æsthetic quality, landscaping.

Draughting-room exercises in architectural design, integrated with other courses, sketching and rendering; model-making.

During the summer months between first and second years, students will be required to prepare an illustrated report. This will be presented at the commencement of second year and be marked as part of the second-year Design course.

40.302, 40.402 Building Construction

Continuation of first-year course, but applied to concrete and steel framed buildings; site fabrication and assembly; prefabrication.

Application of the above to the preparation of working drawings, in co-ordination with the courses in Building Structures and Building Services. Trips to building sites and plants.

40.303, 40.403 Building Services

Ventilation; air conditioning; electrical illumination and power supply; mechanical equipment; transportation; communication; acoustics.

Preparation of working drawings related to above, and to projects in Design and Building Construction. Field trips.

40.305, 40.405 Construction Specifications and Estimating

Contract documents; types of specifications; writing techniques; standard format for North America.

Study of materials and methods; properties of materials and components; construction science; use of indigenous materials and methods; field trips to sites and to factories.

Practical specification writing for a project: use of computers for selection of materials and methods, and for production of project specifications using basic specifications.

Construction procedure of design, tendering, site work and supervision: fundamentals of law; contracts; bonds; contractual relationships; rights and responsibilities.

Estimating—cost accounting cycle; measurement of work from drawings; quantity surveying.

Economics of building; practical cost analysis; bid preparation and submission; contract management.

Cost accounting; production control. Approximate estimates for cost planning and control. Correlation of all building courses into the design-estimating-production procedure.

40.307 Building Structures

Reinforced-concrete beams; tension steel only; one-way and two-way slabs; compressive reinforcements; tee beams; axially and eccentrically loaded columns; simple footings and retaining walls; reinforcing detailing, schedule, and placement; design of forms.

40.308, 40.408 Environmental Services

Gas supply systems; hot-water space-heating system design; practical fan laws; air-cleaning; steam-coil air-heating; hot-water coil heating; combined direct radiation and coil-heated air-heating and ventilating systems; temperature control for space-heating and air-conditioning processes and design; air-conditioning controls.

40.401 *See* 40.301.

40.402 *See* 40.302.

40.403 *See* 40.303.

40.405 *See* 40.305.

40.406 *See* 40.306.

42.407 Building Structures

Combined bending and axial loads; eccentric columns in steel and timber; built-up sections in steel and timber; beam-column connections.

Restrained and continuous beams; strain energy; moment-area; moment distribution; portal and multi-story frames; steel and timber detailing and fabrication.

Discussion of ultimate load design, prestressed concrete, advanced structural forms, and experimental stress analysis.

40.408 *See* 40.308.

CHEMICAL AND METALLURGICAL

41.102 Laboratory Workshop

Use of hand and bench tools; soldering, brazing, and gas welding. Glass-blowing techniques; repair of chemical glassware and construction of simple apparatus. Basic electrical circuitry, electrical fittings, switches, and safety precautions. Organization and control of chemical laboratory, record-keeping, ordering and inventory.

41.103, 41.203 Engineering Materials

Comparative properties of all classes of engineering materials, including metals and alloys, woods, plastic materials, ceramic materials, concrete, and composite materials; bonding forces in solids; microstructures, plastic deformation, work-hardening, recrystallization; failure of materials under operating conditions; plastic materials; elastomers; wood and wood products; introduction to binary phase diagrams of alloy systems; precipitation hardening; heat treatment of steels; plain carbon and alloy steels; ceramic materials; inorganic cements; concrete; composite materials; electrical and magnetic materials; corrosion and weathering of materials. Laboratory assignments in physical testing of materials, properties of materials in operating environments, and comparison of materials.

41.203 *See* 41.103.

41.204 Electrical Materials

Comparison of materials of importance to electrical and electronics technology, including metals, alloys, plastics, and ceramics. Common causes of failure in service, such as fatigue, electrical failures, weathering, and corrosion. Selection of materials on the basis of mechanical, electrical, and magnetic properties.

41.207 Unit Processes

Use of flow diagrams for representing chemical processes; instrumentation flow plan symbols; production of sulphuric acid and nitric acid; production of caustic soda and chlorine; production of phenol; production of phenol-formaldehyde, urea-formaldehyde, and alkyd resins; paints and varnishes; the pulping processes; petroleum refining; sugar refining, fermentation processes and the production of ethyl alcohol; refining of copper, lead, and zinc; production of aluminum; fuel gases; industrial gases.

41.208 Properties of Materials

Comparative properties of engineering materials with emphasis on applications to Electrical and Electronics Technology; plastics, ceramics, metals, and alloys; mechanical properties, electrical properties, corrosion properties, and factors leading to service failures in operating environments.

41.303, 41.403 Analytical Chemistry

Conventional inorganic methods of analysis for the determination of the common metals in ores and alloys. Basic methods of fire assaying for gold and silver. Advanced analytical techniques using various instruments such as the polargraph, spectrophotometer, colorimeter, gas chromatograph, refractometer, spectrograph, X-ray scintillometer, X-ray diffractometer, etc.

41.304, 41.404 Physical Metallurgy

Relation of extractive metallurgy to physical metallurgy; iron- and steel-making processes; review of crystallography; solidification of metals and alloys; casting methods and defects; foundry technology; metal-forming operations; review of phase diagrams for binary and ternary alloy systems; isothermal transformations in steels; heat-treating techniques; non-ferrous metals and alloys; welding metallurgy; principles of non-destructive testing. Laboratory sessions supplement the lectures by field trips to industrial plants and emphasize physical testing of materials, metallography and non-destructive testing.

41.305, 41.405 Assaying (Laboratory Option)

Analytical chemistry applied to the ore minerals with special attention to fire assaying for gold and silver. Both titration and instrument techniques including X-ray diffraction are developed for the more common metals, and the student will be encouraged to attempt as soon as possible after graduation from the Institute the examinations for the Provincial Government licence to practise assaying in British Columbia.

41.306, 41.406 Assaying (Mining Option)

Similar to that for laboratory option but with only half the laboratory time and consequent reduction in application of theory.

41.307, 41.407 Extractive Metallurgy

Comminution, concentration, extracting; crushing, grinding, classification; concentration, flotation, filtration; electrical concentration; magnetic con-

centration; roasting; drying; cyanidation; cementation; ion exchange; differential solution; leaching; amalgamation; pelletizing; production, uses, and treatment of aluminum, copper, gold, silver, iron, lead, zinc, magnesium, manganese, mercury, molybdenum, nickel, antimony, titanium, tungsten, uranium.

41.309 Medical Materials

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 nonferrous metals; polymers, elastomers, and organic adhesives; corrosion and ageing of materials; interaction of materials with biological tissues, toxicity; reference sources and materials selection.

41.403 *See* 41.303.

41.404 *See* 41.304.

41.405 *See* 41.305.

41.406 *See* 41.306.

41.407 *See* 41.307.

41.408 Assaying (Extractive Metallurgy Option)

The identification of economically important minerals, general principles of quantitative analysis of ore samples, including representative volumetric determinations such as acid-base, oxidation-reduction, and volumetric precipitation. Fire assaying, stressing fusion and combination wet-fire methods. Practical applications in instrumental and physiochemical analysis, including the latest analytical aids, polarography, spectrophotometry, atomic absorption, and emission spectroscopy.

CIVIL AND STRUCTURAL

69/70 Day

42.101 Civil Engineering

This course includes the subjects Elementary Hydrology, Concrete Technology, Statics of Structures. In addition, an array of typical civil engineering problems are examined for solution. These solutions may be structural, analytical, geometric, communicative, or economic. Visiting lecturers, movies, slides, and field trips make the student familiar with civil-engineered structures, their uses and their methods of construction.

Elementary Hydrology (42.102).—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.

Concrete Technology.—Cement—types, chemistry, manufacture, and testing. Aggregates—sources, types, production, and testing. Concrete properties—strength, durability, permeability, workability, and testing. Concrete mix design. Production—mixing, transporting, placing, finishing, and curing. Formwork—design, construction, and stripping. Concrete products—precast, lock, pipe, etc. Special topics—cold-weather concreting, colouring, finishing, additives. Laboratory experiments and a field trip.

Statics (42.103).—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 simply determinate structures.

42.201 Civil Engineering

This course includes the subjects Elementary Hydraulics, Elementary Structural Design, Strength of Materials. An array of problems especially from the realms of transport and distribution are presented and solutions examined. Consequently the course introduces highways, airports, wharves, harbours, breakwaters, conveyors, pipe-lines, and irrigation works.

Elementary Hydraulics (42.202).—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; Reynold's experiments, water hammer; flow, laminar and turbulent; open channel flow, regular channels, hydraulic jump, irregular channels; meters, valves, pumps. Laboratory experiments form a part of this course.

Elementary Structural Design.—Historical development of contemporary structural systems; loading, types and assumptions; principles of working stress design and ultimate load design; tension members in steel and timber; connections in steel and timber; compression members under axial loading; trusses and frames; theory of flexure and distribution of bending and shear stresses; deflection and design of beams in steel and timber; combined bending and compression; eccentrically loaded columns; principles of bending in reinforced concrete; design of simple beam and slab with tensile reinforcement only; related problems and model experiments.

Strength of Materials (42.205).—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; slope and deflection of beams; restrained and continuous beams. Strut theories; eccentric loading, lateral loading. Compound stress and strain; ellipse of stress; Poisson's ratio; principal stresses and strains; Mohr's circle. Testing techniques; machines; extensometers; strain gauges; brittle lacquers; photo elasticity; evaluation of results.

42.301 Civil Engineering

This course includes the subjects Introductory Soils Mechanics and Geology, Highway Engineering, Structural Design, Municipal Services. Applications of hydraulic theory in the fields of water supply, wastes disposal, and energy production are given, with guest lecturing on pollution and pollution control.

Soils Mechanics and Geology.—Fundamentals of geology; rocks and minerals; formation of soils, site exploration; sampling methods; field testing; classification of soils; soil particles; structure of soils; porosity; void ratio; moisture content; permeability; ground-water movement; frost action; consolidation theory; settlement; shear strengths; deformation; slope stability; bearing capacities; excavations; types of foundations; earth retaining structures.

Highway Engineering.—Highway geometry: curves, spirals, superelevation, widths, sight distances, surfaces, grades, safety, signs, and lighting.

Highway performance: foundation material, sub-bases, base courses, pavements, behaviour of these materials under varying conditions of load, weather and temperature, drainage, maintenance. The evaluation and design of roadways using deflection data; the Benkelman Beam use and subsequent evaluation of materials; field procedures, compaction specification. Streets: classification, street geometry, widths, sections, drainage; service trench effects, street equipment, lighting, street use, and public relations. Subdivision patterns, the street as dictated by land-use planning.

Structural Design.—Plate web girder; built-up sections in steel and timber; beam column connections; steel and timber detailing and fabrication. Restrained and continuous beams; strain energy; column analogy; moment distribution; tapered beams. Reinforced concrete beams; tee beams, compressive reinforcement; one-way and two-way slabs; footings; retaining walls; reinforcement detailing; scheduling; concrete placement and formwork design.

Municipal Services.—The placement, specification, and recording of all below-grade services in community development; design and draughting of sanitary sewers, storm sewers, and water-main systems. Students gather data in the field and against a land-use proposal design needed services for a specific area. Field trips are taken to observe existing installations and works in construction.

42.401 Civil Engineering

This course includes the subjects of Work Study, Soils Mechanics and Foundations, Municipal Services, Costing and Specifications, Bridge and Building Practice.

Work Study.—*See* 90.491 of the Business Courses.

Soils Mechanics and Foundations.—More intensive study of specifically civil engineering applications; compaction and stabilization of soils; caisson foundations; sheet piling; cofferdams; tunnels and conduits; dams, foundation failures; earth dams; design of cuttings and embankments; highway pavements, airport pavements. Laboratory tests, model experiments, and field trips to exploration and construction sites.

Municipal Services.—The considerations and procedures connected with the layout, design, and construction of city streets. Wherever possible the learning will take place in a design project of some local street and student work may be compared with professional design. Construction may follow.

Costing and Specifications.—Fundamentals of contracts; study of contract documents; specifications as contract documents and as technical directives: contract procedures—the estimating and cost-accounting cycle; measurement and pricing of engineering work; cost records and analysis; unit prices.

Bridge and Building Practice.—Visiting lecturers, movies, and field trips will present practical construction problems and their solutions. This will cover the fields of investigation, design, fabrication, and erection of bridges and buildings, and job layout, job organization, and project financing.

42.402 Civil Engineering

This course is similar to 42.401 but is designed to include Traffic Engineering. To permit this the subjects of Costing and Specifications, Bridge and Building Practice are omitted for students choosing this elective.

Traffic Engineering.—Modes, volumes, trends; accident diagrams and analysis; intersections; signs and markings; signals; parking; street capacities; geometrics; street classification; pavement widths; regulations; urban traffic planning; traffic inventory; travel characteristics; forecasts.

42.403 Civil Engineering

This course is similar to 42.401 but permits extended studies in Structural Design. Bridge and Building Practice is also more extensive. To permit these extensions the subjects of Work Study and Municipal Services are omitted, and Soils Mechanics is reduced for students choosing this elective.

Structural Design.—Portal and multi-story frames; wind analysis; shear and moment in arches; 3-pin, 2-pin, and fixed arch; suspension bridge. Shear flow; shear centre; torsion in beams; curved beams. Tension coefficients; space frames. Flat slabs; prestressed beams; ultimate load design of reinforced concrete. Experimental stress analysis, computer analysis, and discussion of advanced structural forms. Problems and experiments in application of principles to structures.

ELECTRICAL AND ELECTRONICS

43.101 Electrical and Electronic Components

An introduction to the characteristics and applications of the small components most frequently used in the electrical and electronics industries. Standards, coding systems, tolerances, and basic test procedures will also be introduced. Fabrication and assembly techniques will be discussed and applied, with particular emphasis being placed upon special soldering techniques. Basic inspection and quality-control procedures will be introduced.

43.102 Electrical Circuits

A theoretical and practical introduction to circuit analysis as applied to d.c. circuits. The fundamental principles and techniques involved in circuit analysis are introduced at a level requiring a working knowledge of linear equations, determinants, trigonometry, logarithms, and exponential functions.

Course content includes: Study of basic parameters and units, such as current, voltage, resistance, conductance, and power; circuit laws, theorems, and rules as applied to series, parallel, and series-parallel circuits and to network analysis; the behaviour of resistors, capacitors, and inductors in d.c. circuits; introduction to the characteristics of solid-state diodes and transistors.

43.132 Electrical Fundamentals

This is a course given to Natural Gas and Petroleum Technology and Instrumentation Technology students. In it they are introduced to the characteristics and application of basic electric circuits, and they learn the basic techniques of electrical measurement. The course deals with basic electrical units and relationships and illustrates these by their application to basic series, parallel, and series-parallel resistive and reactive circuits, energized by both d.c. and a.c. sources. It also includes a discussion on different types of meter movements and measuring instruments, and emphasizes the correct approach to maintenance and repair of equipment.

43.202 Electrical Circuits

A continuation of Electrical Circuits 43.102, involving analysis of single-phase alternating-current circuits.

Course content includes: The sine wave; average and effective values; impedance; admittance; power and power factor; the characteristics of resistors, capacitors, and inductors in a.c. circuits; laws, rules, and techniques applied to series, parallel, and series-parallel a.c. circuits; resonance; complex algebra and phasor diagrams applied to a.c. circuit analysis; introduction to coupled circuits.

43.205 *Electronic Circuits*

This is a course in understanding and designing basic electronic circuits. Although dealing almost entirely with solid-state devices, vacuum tubes are mentioned. Typical topics include the following: Semi-conductor physics applied to the PN junction and the bipolar transistor; meaning and interpretation of characteristic curves; basic voltage and current amplifying circuits; load-line analysis and choice of Q-point; choice and design of bias circuits; stability; a.c. equivalent circuits; interstage coupling and frequency response considerations; feedback; oscillation and oscillator circuits; power supplies, including voltage and current regulating circuits.

43.232 Electronic Fundamentals

This course, given to Instrumentation students, is a continuation of course 43.132. In it the student is introduced to basic vacuum tube and semi-conductor devices, and other electronic components, and he learns their application to such topics as power supplies, amplifiers, oscillators, feedback circuits, and methods of modulation and demodulation. Pulse coding techniques and logic circuits are also discussed, with their application to, for example, telemetry and supervisory control systems.

43.303, 43.443 *Digital Techniques*

The objective of this course is to introduce the student to those circuits and techniques upon which design and operation of the digital computer is based. These techniques are extremely important since they are now being employed in nearly every area of the electrical and electronics field, including communications, test equipment, industrial control systems, and navigation systems. Topics include: Number systems; applied Boolean algebra; circuit analysis and synthesis; AND, OR, NOT logic; NOR and NAND logic; encoding, decoding, and gating systems; counters and counting systems; shift registers; adders and arithmetic systems; memory systems; analogue to digital and digital to analogue conversion; principles of direct digital control (DDC).

43.311 Electrical Equipment

This course covers the theory, characteristics, and operation of d.c. generators and motors, of transformers, and of single-phase and three-phase induction motors and their associated starting equipment. The fundamental theory of operating and the characteristics of each piece of equipment are presented so that the student may understand its application in a complete electrical system. Characteristics such as voltage and speed regulation, efficiencies, starting currents, torques, and ratings are discussed in detail. Typical examples of all of the above equipment are operated and tested in the laboratory.

43.312 Electrical Circuits

This course is a continuation of the Electrical Circuits 43.202. It introduces many practical circuits dealing with equipment studied in Electrical Equipment 43.311 and 43.411 and in Industrial Electronics 43.314. The course also serves as an introduction to Circuit Analysis 43.412. The first section of the course deals with the properties of magnetic fields and magnetic circuits relating to the fundamentals of magnetic amplifiers, power transformers, solenoids, and rotating machinery. Topics covered in the next section of the course are: Single-phase two- and three-wire distribution systems, three-phase three- and four-wire distribution systems, three-phase power and power-factor correction. The final section of the course deals with the dynamometer movement and its use for three-phase voltage, current, and power measurements.

43.314 Industrial Electronics

This course is an extension of 43.205, with primary emphasis placed on solid-state electronic devices and circuits used in industrial control. A brief discussion of feedback and its effects on amplifier characteristics is followed by a study of d.c. amplifiers, field-effect and unijunction transistors, thyratrons, magnetic amplifiers, and thyristors. Phase control of single and polyphase S.C.R. power amplifiers as well as overcurrent, overvoltage, and thermal protection of power semi-conductors is investigated. Throughout the course applicable measuring instruments and techniques are stressed, and special emphasis is placed on the development of practical circuits which will form the " building blocks " of the course Electronic Control Systems 43.414 studied in the fourth term.

43.320 Measurements

A lecture and laboratory course on the principles and applications of electrical and electronic measuring instruments. Topics to be discussed include: Meter movements, their principles of operation, construction, and characteristics; instruments for the measurement of voltage, current, power, energy, resistance, impedance, frequency; the cathode-ray oscilloscope, its principles of operation and application to the measurement of electrical parameters; signal sources; special read-out instruments, such as chart recorders and digital instruments; transducers, such as thermistors, thermocouples, and strain gauges; techniques involved in measurement; accuracy, repeatability, and traceability in measuring systems and techniques; elementary calibration techniques.

43.325 Electronic Circuits

This is a continuation of course 43.205. Typical topics covered include: Characteristics and circuit applications of other devices, such as the unijunction and field-effect transistor, the thyristor, and various types of diode; power amplifiers; tuned amplifiers; d.c. amplifiers; linear integrated circuits; small-signal circuit analysis techniques.

The course also includes topics to prepare the student for Pulse Circuits 43.425.

43.326 Communications

This course presents the fundamentals of modern electronic communication systems. The characteristics of human speech and hearing form the introduction to the course and set the requirements for telephone and radio communications. Common forms of modulation (i.e., AM, FM, PM, and SSB) are analysed in terms of useful power and occupied band-width along with standard methods of generation and demodulation. Other areas to be covered include basic receiver and transmitter circuits, antenna principles, and electromagnetic wave propagation and frequency division multiplexing as applied to telephone toll systems.

43.331 Electrical Equipment Applications

This is a course given to the Mechanical Technology students on industrial electrical equipment with emphasis on the basic theory and characteristics of a.c. and d.c. motors, their application to typical electro-mechanical drive systems, and the methods of protecting and controlling these motors. The student is helped in using his first-year mechanical courses to analyse the power requirements of the driven equipment. The student is also introduced to industrial electrical-power systems and related equipment. Topics covered are the outside sources of energy, including utility rate structures, transfor-

mation into primary and secondary voltage levels, methods of distributing power throughout the plant, methods of switching, voltage control, and power factor correction.

43.411 Electrical Equipment

This course is a continuation of course 43.311. It covers the theory, characteristics, and operation of three-phase a.c. generators, of three-phase synchronous motors, and of protective devices, such as fuses, circuit-breakers, and relays. Also included is a more detailed discussion of motor-starters for induction motors. Control systems incorporating magnetic starters, magnetic relays, time delay relays, etc., are designed and constructed.

43.412 Circuit Analysis

This course is primarily a problem-solving course on electrical-power systems. Typical utility and industrial power-system problems are presented for analysis. Certain practical problems are studied further in the laboratory sessions. The course introduces the use of per unit and per cent values for solving three-phase power-system problems in voltage-regulation, load-flow, and short-circuit studies. The techniques of symmetrical components are presented to solve unbalanced polyphase circuit problems. The course also covers the use of power circle diagrams for analysing transmission-line power-handling capabilities and the use of power angle curves for checking system stability.

43.414 Automatic Control Systems

This course deals with generalized feedback theory and its application to common industrial control systems. The concept of a transfer function is introduced and applied to circuits and devices investigated in third-term electronics and electrical courses. Augmented by a study of transducers, including photoelectric, magnetic, temperature, and position sensors, this information is utilized in the design and analysis of typical control systems. Topics include servomechanisms, variable-speed drives, current and voltage regulators, position controls, analogue computers, and supervisory control.

43.418 Industrial System Design

This course is oriented toward the design of a typical industrial-plant electrical distribution system. The system is planned, cost estimates prepared, equipment selected, and a detail design prepared. Electrical equipment and problems peculiar to commercial buildings are also covered. Topics discussed include: Lighting layouts; branch circuit wiring; feeders; lighting and power panels; switchboards; motor control centres; voltage selection; system protection; equipment location and layouts; one-line diagrams and electrical equipment schedules, such as motor, starter, and cable schedules.

43.419 Utility Systems

A course on primary generation and distribution of electrical energy by the utilities. The course covers the generation of electricity from other forms of energy, the transmission of this energy to the populated areas, and its distribution to the ultimate user. Topics include: Types, general layouts, and major equipment of generating stations; transmission-lines, including conductors, tower types, and electrical characteristics; types and layouts of substations; radical, selective, and network-type distribution systems; protection of systems and equipment; system planning; rate structures; utility company organization.

43.421 Electrical Systems

This course deals with the distribution, control, and utilization of electrical power. An investigation of the characteristics of polyphase systems is followed by a discussion of protective devices including circuit-breakers, contactors, fuses. A.C. and D.C. machines are studied, with particular emphasis on those characteristics which affect performance of the machine when used as an element in a control system. Thyratrons, magnetic amplifiers, and thyristors are investigated and applied to electronic control applications, including machine control, inverters, d.c.-d.c. converters and "no-break" power supplies.

43.425 Pulse Circuits

A course dealing with the switching properties of bipolar transistors and junction diodes and their application in the design of pulse circuits. Design investigations are carried out on astable multivibrators, free-running blocking oscillators, monostable multivibrators, triggered blocking oscillators, bistable multivibrators, voltage and current ramp generators, and the common forms of logic circuits.

43.427 Microwave

A course introducing the theory of propagation, signal handling techniques, and measurement techniques at the microwave frequencies. Typical topics discussed are: The distributed transmission-line; the general wave equations; the ideal lossless line; travelling waves; standing waves and standing wave ratio; transmission-line impedance; graphical representation of transmission-line characteristics; Smith chart; impedance matching using the Smith chart; the coaxial slotted line; V.S.W.R. measurements; impedance measurements; wave guides; wave guide cut-off frequency; common rectangular wave guide modes; coupling in and out of wave guide structures; impedance matching elements; wave guide tees, attenuators and terminations; directional couplers; detectors; cavities; wave meters, and active microwave devices.

43.428 Electronic Elective

The student takes *one* of the following courses:—

(*a*) *Telecommunications Systems*

This elective is designed as a systems course for those wishing to specialize in the communications field. Subjects covered include: Telephone carrier and microwave systems; frequency division multiplexing; time division multiplexing; common forms of pulse modulation and their applications; signal path and siting considerations; radar systems and navigational aids.

(*b*) *Digital Computer Systems*

The objective of this course is to develop familiarity with the digital computer and its application to process control and supervisory systems. Topics include: Digital computer organization; subsystem analysis; elementary programming; input and output systems; interfacing with digital systems; interfacing with analogue systems; direct digital control (DDC); application of the digital computer to process control systems.

Laboratory sessions apply the principles presented in the lectures to actual digital computers and digital systems. Students will develop skill in programming, design and implementation of logic systems, and evaluation of system performance.

(c) *Circuit Design and Development*

A course that uses synthesis techniques in order to design circuits capable of fulfilling specified system requirements. Topics to be discussed that lend themselves to this approach are:—

(i) Modern, selective filter networks, both active and passive.
(ii) Cascaded, solid-state, tuned RF amplifiers.
(iii) Broadband solid-state amplifiers.

It is the intent of this course that the student carries his design through to the production of a finished engineering prototype.

(d) *Broadcasting Systems*

The objective of this course is to give the student an opportunity to apply much of the general training he has received in electronics to a specialized field—broadcasting. A general coverage of the fields of AM, FM, FM multiplex, monochrome TV., and colour TV. will be followed by analysis of some of the specialized systems used in cameras, audio and video tape recorders, switchers, transmitters, etc. Students will become familiar with the use of test equipment, such as distortion meters, spectrum analysers, frequency monitors, and special-purpose oscilloscopes.

43.429 Supervisory and Control Systems

This course provides an introduction to the principles and practices basic to telemetering, supervisory, and automatic control systems. Topics covered will include: Transducers and data acquisition devices; data transmission systems; data recording systems, including graphic systems and magnetic systems; servo system and servo mechanism fundamentals; stability criteria for feedback and control systems; analogues and digital servo mechanisms; industrial applications of telemetering and control systems.

43.433 Digital Techniques

This course is given to students of the Biomedical Electronics Option of the Health Technology. Its objective is to develop familiarity with digital techniques and their application to electronic equipment and instrumentation used in the medical field. Topics include: Number systems and number manipulation; logic circuits; applied Boolean algebra; NOR/NAND logic; encoding and decoding matrices; counters and counting-systems; shift registers and pattern generators; memory systems; arithmetic systems; analogue to digital and digital to analogue systems; digital computer machine organization, input and output systems; introductory programming, digital interfaces; analogue interfaces; data acquisition systems; computer-based supervisory and control systems.

Laboratory sessions apply the principles presented in the lectures to actual digital computers and digital systems.

43.443 Digital Techniques

Course outline same as 43.303.

FOOD

44.121 Introductory Food Microbiology

The course is designed to train students in the basic microbiological procedures employed in a food laboratory: The use and care of the microscope; staining methods; aseptic techniques used in food microbiology; methods of identifying 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.

44.201 Food Processing

The composition of foods. Nutritional aspects. An introduction to the processes of canning, freezing, pasteurizing, dehydrating, salting, smoking, fermenting, and treating food with ionizing radiations. Experimental lots of food will be preserved by these methods during laboratory periods.

44.221 Microbiology for Food Processing

The application of microbiology to food-manufacturing. The isolation of micro-organisms of significance to food-processing for 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. The taxonomy of micro-organisms of significance to food production. Pollution control. Microbiological assays. Assessing and reporting microbiological test results.

44.251 Food Production

A general introduction to the study of soils, plants, and animals as related to the production of food.

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. Characteristics of packaging materials, including flexible films, and how they meet the package requirements of various foods.

44.311, 44.411 Quality Control

Responsibilities and organization of a quality-control department in the food industry. Equipping a control laboratory. Methods of measuring and controlling quality factors, such as colour, texure, flavour, and consistency in foods. Principles of statistical quality control. Federal and Provincial Government standards. Laboratory periods will provide practical experience in the scoring and grading of processed foods and in the use of various control instruments.

44.312 Introductory Food Analysis

Chemistry of the principal components of the major representative classes of foods and feeds. Moisture in foods. Proximate composition and energy values. Standard methods of analysis for common constituents. Techniques and procedures in general use in food and agricultural products laboratories.

44.341 Mechanics of Machines

Basic mechanical principles. Force and motion as applied to simple machines. Work and energy, power, efficiency. Power transmission, fluid mechanics, thermodynamics as applied to steam power and refrigeration. Materials of construction, corrosion, maintenance, and lubrication. Electrical-power equipment and its use in food processing and production. Whenever possible, food-industry equipment will be used in the laboratory exercises.

44.352 Genetics for Food Production

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 with particular reference to British Columbia.

44.361 Crop Technology

Plant nutrition, including photosynthesis, mineral nutrition, permeability and adsorption of nutrients, water economy, translocation. Plant metabolism. The dynamics of growth and development, integration growth, physiology of reproduction, dormancy and arrested development, differentiation, plant environment.

44.371 Animal Technology

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

44.401 *See* 44.301.

44.402 Process Analysis

This course is designed to acquaint the student with the more important production-engineering aspects of food manufacturing. Basic engineering principles for several food-manufacturing processes will be considered along with materials handling, plant layout and design, and principles of cost analysis. Laboratory sessions will involve experimentation, demonstration, and problem solving.

44.411 *See* 44.311.

44.412 Food Analysis

Detailed chemistry of the products of the food industry: fat and oil, sugar, cereal, fruit and vegetable, dairy, fishery, meat, and poultry products. Vitamins and nutritional supplements. Chemistry of various types of food deterioration and its prevention. Food additives—preservatives, colouring, flavouring, and sweetening agents. Physiochemical and instrumental methods used in food analysis.

44.413 Agricultural Analysis

Chemistry and standard methods of analysis of agricultural products. Determination of major and minor nutrients in fertilizers. Elemental analysis of plant materials and soils. Analysis of cereal grains and animal products. Chemistry of pesticides and fungicides. Instrumental and chromatographic procedures for determination of metallic, pesticide, and other potentially hazardous residues in feeds. Determination of drugs in feeds.

44.414 Experimental Techniques

Design of experiments with crops and animals. Statistical methods, including sampling, tests of significance, regression and correlation, block diagrams, factorial experiments, split-plot, lattice designs, and transformation of experimental data. Layout of actual experiments.

44.431 Sanitation

Organization of a sanitation programme 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 laboratory tests.

44.442 Agricultural Mechanics

A study of basic engineering principles as applied to agricultural operations. Tillage and harvesting equipment. Agricultural spraying systems. Irrigation systems. Hydraulic systems. Care of equipment.

44.462 Crop Protection

A study of the destructive forces of diseases, insects, and weeds on our food production and means of control. Cultural control. Chemical control —insecticides, fungicides, herbicides. Systems of application—dusting, spraying, concentrate spraying, operating and maintaining equipment. Measures of efficiency. Seed treatment. Turf protection. Protection of stored crops.

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 matter, fertilizers. Soil-sampling procedures, extraction methods used in soil analysis.

44.491 Agricultural Products Marketing

An introduction to the marketing environment and marketing institutions in the food products industry; study of the basic marketing functions, marketing research, product planning, selection of trade channels, merchandising, advertising and sales promotion. Case studies and readings are used to relate the theoretical aspects of marketing to the practical problems of marketing agricultural products.

FORESTRY

45.101, 45.201 Forest Science

Fundamental concepts related to the forest. Brief outline indicating the importance of forests and forestry in British Columbia. Basic structure and physiology of the seed plants. Special emphasis on the reproduction of gymnosperms. The classification of plants. The gross and microscopic structure of wood. Wood properties and uses. Identification of the commercial British Columbia woods. The dendrology of trees, emphasizing species native to British Columbia.

45.102, 45.202 Forest Measurement

Methods of measurement of standing and felled timber. Direct measurement of tree diameters, heights, and ages. Characteristics and use of standard volume tables. Construction of local volume tables. Stand and stock

tables. Measurement of site index. Forest inventory and operational cruising techniques, elementary statistical analysis. Types of sampling. Sampling design. Application of aerial sampling and point sampling compilation of data and report writing.

45.106, 45.206 Photo Interpretation and Mapping

Practical use and application of aerial photography in forestry. Recognition and study of landforms and forest types. Measurement of heights, stand densities, and areas. Classification of forest land and cover. Limitations to and use of photos in reconnaissance, planning, and inventory. Practice in use of pocket and mirror stereoscopes, parallax bars, planimeters, dot grids, and other interpretation aids.

Construction of forest maps and plans. Transfer of forest information to topographic and planimetric maps using stereoscopes, Sketchmasters, Map-O-Graph, Kail plotters, and pantographs. Evaluation and use of maps from various sources. Map reproduction techniques.

45.107, 45.207 Forest Utilization

An introduction to the harvesting and utilization of our forest crop. Survey of logging and lumbering practice. Laminated-beam, plywood, round-timber, composition-board, pulp, and paper manufacture. Paper-converting operations. Integration in forest utilization. Field trips to demonstrate lecture material.

45.110, 45.410 Fire Control

Historical review, fire behaviour with simulation through effect of topography, fuel, weather, including weather observation. Pre-suppression, including fire danger ratings, detection, reporting and general pre-organization of industrial and government agencies. *Forest Act,* Part II. Fire-suppression techniques through fire simulation training in initial action and problem-solving.

45.201 *See* 45.101.

45.202 *See* 45.102.

45.205, 45.305 Logging

Description and analysis of systems most commonly used on the British Columbia Coast and Interior. Layout and construction of settings, roads, and landings. Pre-logging, salvage, and thinning. Equipment developments. Logging plans. Woods safety logging organization and contracts. Budgets, records, and accounting for a logging camp.

45.206 *See* 45.106.

45.207 *See* 45.107.

45.302, 45.402 Forest Measurement

Instruction in log scaling for Coast and Interior operations. Scaling for woods, records and inventory. Cubic- and board-foot log scales. Conversion factors and volume calculations. Field application of cruising techniques. Office compilation and cruise report preparation. Cruising for inventory and logging development. Preparation of forest maps. Familiarization with British Columbia Forest Service cruising systems and maps. Project planning and implementation. Use of computers for mensuration data.

45.305 *See* 45.205.

45.308, 45.408 Roads and Transportation

Design of transportation plans to fit timber and terrain. Road specifications to suit production plans. Truck-road location, construction, and maintenance. Earth and rock work. Drainage, culverts, run-off control. Snow removal and winter roads. Small bridges, log dumps, booming-grounds. River improvements, rafting and barging. Road costs.

45.309, 45.409 Silviculture

Introduction to elementary silvics, silvicultural principles and systems, intermediate cuttings. Natural and artificial regeneration, including site preparation, brush control, planting, seeding, and care of nurseries. Planting surveys and crews, pruning, thinning. Systems of cutting and effects on future growth, stand composition and yield. Silvical characteristics of major British Columbia species. Forest soils. Forest stand types and relation to logging planning. Regional silviculture—Coast, Interior. Introduction to genetics and ecology. Forest classification. Project planning and report writing.

45.313 Forest Pathology

Study of forest disease problems in British Columbia. Training in field recognition of the various types of diseases, such as root rots, trunk decays, mistletoe, stem rusts, cankers, and foliage disease. Basic understanding of the various life cycles, the economic impact of disease losses, and field methods of measurement of disease attack. Current applicable control measures through management and silviculture practices. Agencies involved in current research.

45.316, 45.416 Forest Management

Principles of sustained yield, regulation of the cut, rotation, allowable cut, multiple use. Administration of Crown and private timber via timber sales, tree-farm licences, pulp harvesting areas, farm wood-lots. Inspections and supervision. Sloan Report. *Forest Act.* Stumpage appraisal—principles, methods, and application of estimations of value of standing merchantable timber. Principles of forest valuation. Damage appraisal.

45.402 *See* 45.302.

45.408 *See* 45.308.

45.409 *See* 45.309.

45.410 *See* 45.110.

45.414 Forest Entomology

Forest insect problems in British Columbia. Recognition of insect damage in the field. Study of the major types of harmful insects, and their effects on timber stands and forest products. Field measurement of insect attack and sampling procedures. Current applicable control measures and agencies involved.

45.416 *See* 45.316.

FOREST PRODUCTS

46.207 Forest Utilization

A course designed to assist students in selecting their second-year option. A detailed introduction to the pulp and paper industry and to those wood-using industries related to the manufacture of lumber, plywood, laminated construction, and composition boards.

46.301, 46.401 Pulp and Paper Technology

History of pulp and paper making. The industry in Canada and the world. World fibre sources. Wood structure and fibre morphology. Wood chemistry. Preparation of wood. Water treatment. Principles of pulping. Mechanical, semi-chemical, and chemical pulping. Handling of unbleached pulp. Preparation of pulping chemicals. Chemical and heat recovery. Pulp bleaching. Preparation of bleaching chemicals. Drying and packaging of pulp. Pulp uses. Pulping by-products. Paper and paperboard manufacture. Microbiology of pulp and paper. Mill instrumentation. Materials of construction. Mill hazards and safety. Pollution abatement. Possible future developments.

46.304, 46.404 Pulp and Paper Testing

Process chemicals evaluation and water quality. Process control tests, including wood and chip tests, pulping and bleaching liquor tests, pulp viscosity and bleachability, consistency, fibre and screening losses. Fibre microscopy and photomicroscopy. Beater and freeness testing. Sheet-making. Physical tests, including basis weight, caliper, density, brightness, opacity, stiffness, absorbency, porosity, smoothness, printability, dirt count, fibre classification. Chemical tests including acidity, alkalinity, pH, ash, resin.

46.311, 46.411 Wood Properties

Wood anatomy and identification of important commercial species. Preparation of microscope slides. Photomicrography. Wood growth, natural defects and agencies of deterioration. Chemical, physical, and mechanical properties of wood. Strength tests. Wood adhesives and surface coatings.

46.314, 46.414 Wood Processing

Log preparation: bucking, sorting, barking. Lumber and plywood manufacture. Chipping, wood seasoning, preservation. Fire retardants. Laminated woods. Edge and end gluing. Composition boards. Round timbers and modified wood products. Millwork.

46.317 Quality Control and Marketing

An introduction to the marketing environment and marketing institutions in the wood products industry. Study of the basic marketing functions: market research, product planning, selection of trade channels, merchandising, advertising and sales promotion. Case studies and readings used to relate the theoretical aspects of marketing to the practical problems of the wood products industry.

46.401 *See* 46.301.

46.404 *See* 46.304.

46.407 Wood Chemistry

Basic organic chemistry. Chemical composition of wood. Structure of the major wood components: extractives, lignin, hemicellulose, and cellulose. Chemistry of the wood components, particularly as related to commercial pulping processes. The chemistry of cellulose derivatives.

46.411 *See* 46.311.

46.414 *See* 46.314.

46.417 Quality Control and Marketing

Lumber grading, tallying, and shipping. Plywood grades and sizes. Quality control methods in lumber, plywood, glulam, preservation, and composition board. Statistical quality control.

46.421 Wood Products Management

Communications and human relations, production planning, planning, manpower, and problems in supervision; products management practices, policies, and organizations; job analysis, safety techniques, and wages and salaries.

46.451 Mechanical and Electrical Equipment

A study of mechanical and electrical equipment relating to development, transmission, application, and control of power as applied to the wood products industries. A.c. and d.c. drives, controls, and characteristics; distribution of power systems; prime movers, speed conversion, drives and bearings; hydraulic and pneumatic systems.

NATURAL GAS AND PETROLEUM

47.221 Distribution and Utilization (Gas)

City gate stations; regulation and odourization; 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

Petroleum geology; 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.

47.341, 47.441 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, flotation; flow of heat, conduction, convection, radiation, film and over-all transfer of coefficients, heat exchangers; principles and application of equipment for evaporation, distillation, absorption, extraction; humidification and dehumidification; drying; crystallization; ion exchange.

47.431 Refining and Utilization (Oil)

Crude oil, distillation; cracking, thermal and catylitic; reforming; hydrogenation; oil products, product testing, storage, loading, combustion stoichiometry; oil and gas engines, oil burners.

47.441 *See* 47.341.

INSTRUMENTATION

48.100, 48.200 Process Measurements

Introduction to Instrumentation Technology; instrument symbols; static characteristics; applications. Dimensional analysis applied to instrumentation.

Density Measurement.—The hydrometer, Westphal balance and bubble-tube systems.

Level Measurement.—Float, electrode, sonic, hydrostatic, and capacitance systems.

Pressure Measurement.—The manometer, Bourdon gauge, bellows, diaphragm, Pirani and ionization gauges.

Dynamic Response of Instruments.—First order systems with step and linear inputs.

Electrical Measurement.—Voltmeters, ammeters, wattmeters, potentiometers, and resistance bridges.

Temperature Measurement.—Expansion thermometers, thermocouples, resistance thermometers, thermistors.

Flow Measurement.—The venturi, nozzles, orifices, pitot tubes, rotameters, weirs, magnetic flow meters, turbine flow meters, volumetric flow meters.

48.110 Instrument Shop Practice

Precision machining and measurement of small items. Fabrication of linkages and typical components. Heat treatment, including welding and soldering. Tube-bending and pipe-fitting.

48.300, 48.400 Process Measurements

This course is essentially a continuation of 48.100, 48.200.

Weight Measurement.—Units and standards, weight beams, springs, pneumatic and hydraulic load cells, strain gauges.

Humidity and Dewpoint Measurement.—Including the psychrometer and hygrometer.

Viscosity Measurement.—Rheology, falling ball, variable area, capillary, rotating cylinder, and vibrating probe methods.

Gas Analysis.—Chemical absorption, thermal conductivity, paramagnetic, heat of combustion, and polargraphic methods.

Electrolytic Conductivity.—Electrode and electrodeless methods.

pH Measurement.—Litmus, dye, electrometric, and oxygen reduction methods.

Spectrometry.—Light sources, filters, dispersive elements, and detectors.

Chromatography.—Paper and column methods.

48.310, 48.410 Process Control

History of development. Concept of the process control loop.

Final Control Elements.—Regulators and control valves, actuators, feedback concept, positioners.

Process Response.—Static and dynamic response, self-regulation, process time-constants, controllability.

Simple Controllers.—Two-position, single-speed floating and high gain controllers, proportional control offset, speed of response.

Three-mode Control.—Proportional, reset, and rate actions in various combinations. Typical pneumatic and electronic controllers. Controller tuning and calibration.

Computer Analysis.—Process and controller analogues, special functions, typical control loop analogues, modelling and scaling.

Frequency Response Analysis.—Used mainly as an aid to understanding gain and phase shift characteristics in a control loop.

Special Applications.—Cascade, feedforward and ratio control. Practical process layouts.

48.320, 48.420 Computer Techniques

Basic analogue and digital concepts. Types of computer. Hybridization. Use of components in instruments.

Part I.—Analogue Computation

Passive and Active Components.—Potentiometers, operational amplifiers, the solid-state d.c. hga., specifications.

Math Functions.—Summation, integration, initial conditions, differentiation, multiplication.

Special Functions.—Exponentials, arbitrary functions, transportation lag, analogue memory.

Analogue Programming. — Process analogues, formula and modelling methods, scaling, repetitive operation, iterative techniques.

Part II.—Digital Computation

Digital Concepts.—Number systems, coding systems, logic levels, concept of OR, AND, NOT gating methods.

Symbolic Logic.—Basic equations, NOR/NAND logic, truth tables, algebraic and graphical methods of minimization.

Logic Circuits.—Flip-flops, counters, shift registers, half and full adders, multivibrators.

Interfacing.—D/A and A/D conversion. Memory systems, input and output systems.

48.330 Electronics for Instruments

The application of standard electrical and electronic circuits for the particular requirements of process measuring instruments. D.c. to a.c. converters; voltage and power amplifiers; a.c. and d.c. bridges.

48.350 Instrumentation

An orientation course for students of other technologies. A comparative study of devices used to measure pressure, temperature, level, and flow. Flow sheets and symbols. Demonstration of static and dynamic responses. Applications to processing industries.

48.370 Instrumentation

A one-term orientation course for students of other technologies. A study of measuring devices, related to pressure, temperature, level, flow, and density. Basic concepts of feed-back control, from regulators to control loops. Flow sheets, symbols, and typical applications.

48.430 Industrial Orientation

Introduction to Engineering Economy. Supply and demand. Interest and depreciation. Capital and operating costs. Break-even analysis. Economics and safety. Codes and regulations. Safety equipment. Alarm systems. Production control techniques. Administration.

48.450 Instrumentation

A continuation of the orientation course 48.350. Principles of process control, process reactions and loop time-constants. Regulators, ON-OFF; proportional, reset and rate action. Multi-control loops, flow ratio and feed forward control. Applications, flow sheets, control problems. Analytical measuring circuits; O_2, conductivity, density, and chromatography. Introduction to digital techniques; electronic counters.

48.460 Medical Instrumentation

A study of the principles of analysis instruments using potentiometric, amperometric, and polaragraphic techniques; ultraviolet, visible, and infrared spectroscopy; flame photometry; paper and column chromatography; electrophoresis and refractometric methods.

48.470 Instrumentation

A one-term orientation course for students of other technologies. A comparative study of measuring devices related to pressure, temperature, level, density, and flow. Basic concepts of feed-back control, process reactions and loop time-constant. From regulators to control loops. Applications, flow sheets, symbols and identification. Introduction to analytical measurement of O_2, conductivity, chromatography. Introduction to digital techniques and electronic counters.

MECHANICAL

49.101, 49.201 Draughting

Orthographic and isometric projection; lettering; technical sketching; sections; conventional practices; dimensioning; working drawings; intersections and developments.

49.105 Applied Mechanics

Vectors; force systems; graphical representations and solutions; analysis of practical problems involving static and dynamic loads; friction and acceleration forces; inertia; torque; work; power; introduction to hydraulics.

49.106 Applied Mechanics A

A study of applied mechanics for non-Mechanical students. Topics include statics, forces, moments, couples, frames, beams, centroids, friction, dynamics, motion in a circle.

49.150 Production Engineering

1. *Machine Tool Theory.*—Metal-cutting materials, mechanics of metal-cutting, tool geometry, single-point and multi-point cutting-tools, tool life and cutting speeds. Metal removal rates and power with experimental work to demonstrate these principles.

2. *Metrology.*—General concepts and principles of measurement. The use of standards. Graduated manual measuring-tools, dial indicators, gauges, micrometers, verniers, sine bar, etc. Surface texture measurement using mechanical-electrical systems of measurement.

49.165, 49.265 Shopwork

Practical experience in the use and application of basic metal-cutting machine tools—engine lathe, drill press, shaper, milling machine, power saw, planer, and precision grinder; layout and bench work; precision measuring; tool sharpening.

49.201 *See* 49.101.

49.206 Engineering Concepts

Study of some of the basic principles required in engineering design. Solution of problems involving mechanics and strength of materials. Practical work to be carried out by the student in the engineering materials laboratory.

49.210 Strength 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 cylinders, riveted and welded joints. Laboratory testing of engineering materials and common machine elements.

49.225 Applied Heat

Study of basic topics leading to engineering thermodynamics, including heat, energy, work; fluid properties, processes and systems, ideal gases, enthalpy and entropy; first and second laws of thermodynamics; Carnot engine and heat pump; standard air cycles; calorific values of fuels. Laboratory work will be carried out to supplement theory presented in lectures.

49.250 Production Engineering

1. *Machine Tool Theory.*—The utilization of modern machine tools for manufacturing processes. The lathe, boring mill, milling machine, shaping machine, drill press, jig borer, etc. Simple planning of operational sequences for manufacture of simple components.

2. *Metrology.*—Interferometers and associated devices, optical comparators, optical alignment of tools, the flatness of surfaces, and surface texture. The metrology of angles, screw threads, and gear teeth. Measuring-machines.

49.265 *See* 49.165.

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.

49.267 Introduction to Machine Tools

The study of modern machine tools with practical experience in their use and application. Costs and economics related to production.

49.301 Engineering Graphics

A study of advanced draughting practices and graphical solutions to engineering problems.

49.312, 49.412 Machine Design

Basic principles of machine design, including application of fundamentals of mechanics, strength of materials, draughting techniques, and physical properties of materials toward creation of complete machines for economical production and efficient operation. Incorporation of practical experience gained in machine-shop periods into practical designs is stressed. Study of common machine elements, including beams, columns, shafts, gears, belts, pulleys, couplings, and screws, and incorporation of these into more complex assemblies.

49.315 Fluid Mechanics

Principles of hydrostatics, including properties of fluids; pressure measurement; forces on submerged surfaces; fundamentals of fluid flow; flow

through pipes, nozzles, and orifices; streamline and turbulent flow; flow measurement; dimensional analysis. Laboratory tests are performed to verify lecture theory.

49.325, 49.425 Thermal Engineering

Review of fundamentals of thermal systems. Study of steady-flow processes; thermodynamic properties of pure substances and of mixtures of liquids, vapours, and gases; energy sources and energy release; steam processes and power plants; centrifugal pumps and fans and associated systems; heat transmission, refrigeration and air-conditioning; air compressors and internal-combustion engines. Laboratory work includes investigation into fluid flow measurement, combustion of fuels, steam conditions and performance influences on machinery such as steam turbines and generators, heat exchangers, pumps, fans, refrigerators, air compressors, gas turbines and other internal-combustion engines.

49.350, 49.450 Production Engineering

Study of various elements of industrial operations, including cost estimating, product development, plant location, plant facilities, plant layout, materials handling, plant engineering and maintenance, production control, quality control, productivity, automation, low-cost automation, numerical control of equipment.

49.365, 49.465 Shopwork

Continuation of Shopwork 49.165 and 49.265 with further experience on machine tools, including boring mill, jig borer, tool and cutter grinders, turret lathe, die sinker, and punch press; use of fine measuring tools.

49.412 *See* 49.312.

49.425 *See* 49.325.

49.435 Fluid Power

Study of the basic components of hydraulic and pneumatic systems and how they are combined to build up various circuits. The uses of hydraulics and pneumatics for both power transmission and control purposes are covered. Laboratory work includes experiments and tests on various types of equipment used in industry.

49.445 Manufacturing Processes

Study of modern manufacturing processes, including the machines, materials, methods, and practices used in the mechanical industries; casting; welding; hot and cold forming; extruding; forging; die casting; stamping; and pressing. Course content is related to material covered in Engineering Materials and to training given in Shopwork 49.165 to 49.465. Field trips to appropriate local industries are arranged.

49.450 *See* 49.350.

49.455 Tool Design

Study of tool design as related to manufacturing methods and requirements; tooling for production and gauging; standard tooling components and devices; consideration of drill jigs, press tools, punches, dies, and special devices.

49.465 *See* 49.365.

MINING

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

This course covers the following topics: Nature of the mineral industries, brief history, classification, and principal activities; search for economic mineral deposits and elements of prospecting techniques; preliminary exploration methods; terminology of mine development; basic framework of evaluation; outline of production and treatment methods; recoverable unit value, smelter contracts, and costs of mining; evaluation, sampling methods, weighted arithmetic mean, determination of average grade and definition of ore reserves; means of acquiring title to mineral property, the *Mineral Act;* exploitation of mineral deposits, planned systems of extraction, and classification of mining methods.

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.

Laboratory work includes examination 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

Subjects covered are: Mining economics; total cost components; selection of equipment; utilization of equipment; break-even ratio; breaking ground; ground support; ore- and waste-removal equipment and systems; development drives, cycles, rounds, controls; examples of mining practice; control of water, drainage, grouting; ventilation; occupational hazards; *Mines Regulation Act;* mine organization.

Laboratory sessions consist largely of field trips to mines and local suppliers of mining equipment for familiarization with mining methods, systems, and equipment. In addition, specific laboratory sessions are 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.

A three-day course given by the British Columbia Department of Mines and Petroleum Resources during the spring break leads to a certificate in mine-rescue work.

50.304, 50.404 Mineral Processing

Purpose of mineral processing. Essential operations: comminution, concentration, extraction. Crushing: forces available; product size distribution, reduction range; types of crushers. Screening: efficiency and capacity; screen types; closed-circuit calculations; crushing and screening flowsheets. Grinding: attrition mills, high-energy mills, tumbling mills; energy input; grinding media; liner forms and their effect. Classification: free and hindered-settling concepts; cyclones, hydraulic classifiers, mechanical classifiers; closed-circuit classification.

Concentration: hand sorting, gravity concentration, heavy media; gravity flowsheets. Flotation: collection, activation, depression, frothing; flotation machines; flotation flowsheets. Electrical concentration. Magnetic concentration. Filtration, drying, pelletizing.

Extraction processes: roasting, cyanidation, cementation, ion exchange, differential solution, autoclave leaching, amalgamation.

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.

Laboratory work will illustrate and develop techniques in: megascopic study and identification of hand specimens; valuation of mineral deposits.

Field trips will be correlated with all classroom work in geology.

50.402 *See* 50.302.

50.403 *See* 50.303.

50.404 *See* 50.304.

SURVEYING

51.101, 51.201 Surveying

Introduction, types of survey; fundamental principles, accuracy and precision, errors and mistakes; measurement of distance, direction and elevation, calculation of latitude and departure areas and volumes; horizontal and vertical curves; use of plane tables, levels, compasses, transits, theodolites, chains, and calculating machines; note-keeping and plotting of records; care, maintenance, and adjustments of equipment.

51.102, 51.202 Surveying

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

51.104 Introduction to Survey for Natural Gas and Petroleum Technology Students

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.

51.201 *See* 51.101.

51.202 *See* 51.102.

51.203 Natural Science

Study of the forest flora of British Columbia; biotic zones, their boundaries, altitude, climate, and natural flora; the characteristics of native trees, 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.

51.204 Introduction to Survey for Building Students

Introduction to engineering survey; linear distance; introduction to the theory and use of the theodolite; direction, bearings, and angles; use of traverses in site engineering, areas and volumes; elevations, use and theory of the level; use of the plane table; simple circular curves.

51.301, 51.401 Plane Surveying II

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, hydrographic surveys, mining surveys, legal surveys, and higher-order surveys.

Engineering surveys to include topographic surveys by various methods, setting out work for construction and sewers, etc. Highway design and layout involving vertical curves, horizontal curves, transition curves and terminal curves, railway grades, and transition curves.

Hydrographic surveys to include tides, shoreline surveys (large and small), sounding methods, and reduction and plotting soundings.

Mining surveys to include special equipment, underground surveys, surface surveys, and mineral claims.

Legal surveys to include survey acts, survey marks, types of surveys, re-establishment of section and lot corners, subdivision of land.

Right-of-way surveys; methods for city work, rural work, and town planning.

Higher-order surveys to include optical tooling and jigs, automatic plummets, first-order levels and first-order baselines.

51.302, 51.402 Geodetic Surveying II

Generally deals with surveys which take into account curvature of the earth, and in conjunction with 51.303, 51.403 covers related mathematics, theory of error, convergency, geographic co-ordinate system, map projections, polyconic to geographic co-ordinates, measurements in geographic co-ordinates, vertical control, triangulation and trilateration, adjustment of triangles, quadrilaterals, level circuits, etc., strength of figure, heights of towers, and other miscellaneous problems.

51.303, 51.403 Computations II, A and B

This course is run in conjunction with 51.301, 51.401 and 51.302, 51.402, and is divided into two parts, A and B.

Part A is computations pertaining to plane surveying and includes missing parts, areas, volumes, reduction of electronic measurements, vertical curves, spirals, terminal curves, laying out and dividing problems, etc.

Part B is computations pertaining to geodetic surveying and includes spherical excess, curvature and refraction, heights of towers and reciprocal slope angles, convergence of meridians, geodetic and geographic co-ordinates, reliability of observations and weighting, reduction to sea-level, three-point problems, reduction to centre, and balancing networks.

Both these parts involve some use of electronic machines and programmed computers.

51.304, 51.404 Field Surveying II

Deals with the field methods used in conjunction with plane and geodetic surveying and is done in conjunction with these subjects; 51.304 consists mainly with the students learning how to use the different instruments, and 51.404 mainly with practical projects making use of these. Specialized instruments used include 1" transit, subtense bar, sextant RDS type, RDH, geodimeter, tellurometer, mining transit, gyro theodolite, precise levels, etc.

Projects are aimed at engineering hydrographic, mining, legal, and precise surveys and include some triangulation and trilateration work.

51.305 Draughting

Application of draughting fundamentals to preparation of plans for, preliminary plans, construction plans, "as built" plans, subdivision plans, highway and other right-of-way plans, posting plans, and plans and field-notes under the *Land Act* and *Mineral Act* in accordance with the General Survey Instructions to British Columbia Land Surveyors issued by the Surveyor-General of British Columbia.

51.306, 51.406 Astronomy

Introduction to practical astronomy; solid geometry and 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

Introduction to photogrammetry; horizontal photographs, aerial photographs; cameras; flight planning for vertical photography; determination of scale; mapping from aerial photos; mosaics, use and method of construction; principle of stereo-vision; determination of heights from aerial photos; photo interpretation; route reconnaissance; radial-line plotting; oblique photos; plotting machines.

51.308 Description for Deeds

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"; the importance of a good "point of commencement"; descriptions by adjoiners, description by aliquot parts, descriptions by metes and bounds, descriptions by exceptions, descriptions of rights-of-way by means of centre line; plans to accompany descriptions; Land Registry Office procedure; descriptions pertaining to Acts of the Legislature.

51.309, 51.409 Surveying for Civil and Structural Technology

Application of survey methods to construction surveys, topographic surveys; triangulation; base-line measurement, use of electronic measuring devices; route surveys, including preliminary profile and cross-sections, calculation of quantities and volumes, and plan preparation; site surveys, including horizontal and vertical control; bench-mark levelling and adjusting of nets; calculation of areas, volumes, closure, circular curves, transitional curves, and vertical curves; elementary photogrammetry applied to planning, site surveys, route surveys, grades, and quantities.

51.310, 51.410 Surveying for Mining Technology (Mining Option)

Application of survey methods to underground surveying; definitions of mining terms; illumination of stations; use of mining transits, auxiliary telescopes; connecting surface and underground surveys, transferring azimuth to underground surveys, transferring elevations to underground surveys; location of property boundaries underground; location of tunnels, control and alignment, determining quantities; note-keeping, plotting, and construction of plans and sections related to mining, computation of closures, areas, and volumes; elementary astronomy, derivation of meridian; elementary photogrammetry applied to mining.

51.311, 51.411 Surveying (Photogrammetry Option)

Control surveys by triangulation, trilateration, and traversing; indirect optical distance measurement; electro-magnetic distance measurements; the gyro-theodolite; position fixing by means of terrestrial navigational devices; trigonometrical and barometric levelling; survey adjustments; national survey systems.

51.313 Draughting (Photogrammetry Option)

Lettering and scales, diagrams; grids and graticules; symbolization (national map series); scribing; type patching; surround detail; topographical cartography; draughting materials and specifications; star charts on the stereographic projection; control point field sketches.

51.317, 51.417 Photogrammetry

The geometry and physical nature of the photograph; the survey camera and auxiliary air-borne equipment; mapping from single photographs; radial line triangulation and plotting; stereoscopy and height determination from parallax bar measurements; stereoplotters and their operation; mono and stereo comparators; aerial triangulation; the provision of ground control; field completion; mapping from oblique photographs; terrestrial and close-up photogrammetry; engineering applications of photogrammetry; air-photo interpretation; the organization of photogrammetric operations; the history of photogrammetry.

51.403 *See* 51.303.

51.404 *See* 51.304.

51.406 *See* 51.306.

51.407 *See* 51.307.

51.409 *See* 51.309.

51.410 *See* 51.310.

51.411 *See* 51.311.

51.417 *See* 51.317.

HEALTH TECHNOLOGY

82.101, 82.207 Introduction to Behavioural Sciences

This course is designed to give the student in Health Technology an awareness of the psychological, social-psychological, and sociological factors which influence health in our complex changing society. Emphasis will be placed on the individual as a member of the family, the health team, and the social system.

82.102, 82.201 Basic Medical Microbiology and Epidemiology

A course designed for students who are having their first experience with the world of microbes, which includes bacteria, viruses, protozoa, fungi, and rickettsiæ.

The student will acquire an understanding of the structure and activities of the micro-organisms, their reservoirs in nature, their pathways to the human host, and the many ways of recognizing, identifying, and combating them.

82.103, 82.202 Human Anatomy and Physiology

In the first term this service course is a brief survey of basic human anatomy and physiology. The second term is devoted to a more-detailed perusal, with the emphasis on physiology. Whenever possible this second-term material is oriented toward particular programme requirements.

82.104 Medical Laboratory Orientation

An introduction to the procedures and principles of operation of precision instruments and equipment used in the clinical laboratory.

82.105, 82.204 Food Sanitation

A course for public health technologists in the sanitary practices and inspection techniques associated with the production, processing, and distribution of food. Visits are made to appropriate food-handling facilities.

82.106 Introduction to Medical Radiography

This course includes studies of the basic exposure factors, the technical terminology of radiography, and the significance of X-ray quality.

82.107 Collection of Health Data

This course is designed to introduce the student to the field of health data. Special areas of study will include medical terminology, pathological conditions significant to health data collection, and the sources of health data.

82.108 Introduction to Nursing

This course provides the nursing students with introductory scientific principles designed to help them acquire a beginning understanding of the basic communicative and motor skills which nursing utilizes. A problem-solving approach toward assisting patients to meet their basic needs will be introduced.

82.109 Introductory Clinical Experience in Nursing

The clinical experience taken concurrently with 82.108 will be directed toward orienting the student to the hospital environment.

82.110, 82.208 *Pharmacology*

The broad objectives of this course are to provide the nursing student with a basic knowledge of the various medications and medicinal agents which are used in the care of patients. The computation of dosages is also included.

82.111, 82.209 Interpersonal Relations for Nursing

This course covers the interpersonal aspects of nursing, with emphasis on developing observation and communication skills. Group discussions based on the students' own experience with patients are conducted. Small groups of students discuss their interactions with patients and learn how to use their interpersonal skills in a variety of situations. The emphasis is on normal and adaptive behaviour.

82.112 Physiological Chemistry

This course is designed to introduce the student to the chemistry of major physiological processes in the body. It includes a review of basic chemistry theory and an introduction to organic chemistry and biochemistry.

82.113 Not allocated.

82.114 Apparatus and Image Recording

This course introduces the student to the photographic aspects of radiography and the technical terms used. The fundamentals of image recording and processing are included. Accessory radiographic equipment, such as grids, cones, and filters, is covered.

82.201 *See* 82.102.

82.202 *See* 82.103.

82.203 Basic Medical Radiography

This course is concerned with the conditions influencing the choice of exposure factors. Patient positioning is studied. The student is made aware of hospital organization, levels of responsibility, and the operation of other hospital services. The administrative procedures common to X-ray departments are considered.

82.204 *See* 82.105.

82.205 Basic Nursing

The student is introduced to the problems which comprise the broad basis of medical-surgical nursing. The study of pathophysiology, pharmacology, and diet therapy and clinical experience is built around this broad base.

82.206 Clinical Experience in Basic Nursing

The clinical experience taken concurrently with 82.205 includes operating-room and surgical and medical nursing associated with the less-complicated pathological conditions.

82.207 *See* 82.101.

82.208 *See* 82.110.

82.209 *See* 82.111.

82.210 Human Growth and Development

The course provides information on the normal process of growth and development from conception to senescence. Physical and motor, adaptive, emotional, language, and social development are viewed longitudinally. Various development theories will be presented for discussion. Problems associated with the adolescent and senescent stage of development are included.

82.211 Pathology and Pathophysiology

The subject includes the basic divisions of pathology and pathophysiology of common disorders. Instruction is closely correlated with the courses in normal physiology, basic nursing, and to hospital experience.

82.212 Introduction to Radiation Safety

This course provides a basic knowledge of the biological effects of radiation and the hazards connected with the ingestion or inhalation of radioactive material. Contamination and its prevention are considered. The procurement, storage, shielding, handling, monitoring, and disposal of isotopes in accordance with national regulations are studied.

82.213 Subject discontinued.

82.214 Fundamentals of Patient Care

This course covers basic skills and techniques which will assist the student to function effectively in the clinical area. The emphasis will be upon the patient and his health problem. The student is made aware of the patient as an individual and the importance of observation and communication. The student is introduced to factors which influence patient care in the hospital environment and measures used in giving assistance in emergency situations.

82.215 Anatomy and Physiology for Radiographers

This course covers the details of human anatomy as they apply particularly to the theory and practice of medical radiography. Elementary physiology of all body structures is studied. Structures of the body are studied with reference to surface markings and with the aid of radiographs.

82.216 Apparatus and Image Recording

A study in detail is made of the characteristics and structure of the various types of radiographic film.

82.217 Clinical Experience in Basic Medical Radiography (Orientation)

The student spends this time in the X-ray department of one of the affiliated hospitals. The student is made familiar with the day-to-day operation of an X-ray department and the technician's role in this operation. In addition, familiarization tours are made of the various departments within the hospital. The student is permitted to assist, within the limits of his capabilities, in the routine procedures of the X-ray department. This gives the student an opportunity to see applied the principles taught in the classroom.

82.218 Summer Term Nursing Practicum

This course is essentially concentrated clinical experience when the student is provided with the opportunity to increase skill and applications of knowledge to nursing in the clinical area.

82.301, 82.404 Environmental Health and Engineering

This course is designed to provide the basic technical knowledge and methods of measuring and assessing the engineering aspects of the human environment. Parallel with this, the effects of environmental hazards and stresses are studied in order that their effects on the human organism may be assessed. Emphasis is placed on the study of water supplies; sewage and refuse disposal; air, water, and soil pollution; and pest and rodent control at the domestic, municipal, and community levels. In addition, special con-

sideration is given to the measurement, chemistry, and microbiology appertaining to the above subject areas. Further topics will include recreational facilities, occupational hygiene, community planning, and safety, effects, and hazards of radiation, plumbing, housing, and other related subjects.

82.302 Histology

The morphology of human cells, tissues, and organs. Emphasis is placed on the preparation of tissues for microscopic examinations: methods of fixation, embedding, sectioning, staining, and mounting.

82.303 Instrumentation in Clinical Chemistry

This course, designed primarily for the medical laboratory technologists, emphasizes the application of the following instruments: photometers and calorimeters, flame photometers, auto-analysers, fluorometers, etc. The use, care, and calibration of the instruments used in the clinical chemistry laboratory is taught, using biological specimens to demonstrate techniques involved.

82.304, 82.407 Clinical Experience in Medical Radiography

This course runs concurrently with 82.309 and 82.413. The student acquires a broad knowledge of medical radiographic techniques by applying classroom and laboratory training in actual clinical situations in affiliated hospitals.

82.305, 82.405 Health Data Applications

The aim of this course is to introduce the student to the handling of health data. Emphasis will be upon generation, processing, and transmission of health data. Experience in the handling of data is gained through allocation of special projects.

82.306, 82.410 Public Health Administration

The objective of the course is to enable the public health technologist to work effectively with the other public health workers, local, provincial, and federal governments, and the general public in the pursuit of a healthy environment. Subjects studied include the organization of health services and related government structures, communications, health education, managerial practices, and the development and evaluation of the community health programmes.

82.307, 82.411 X-ray Apparatus and Image Recording

A detailed study is made of the theory and operation of the X-ray machinery, auxiliary apparatus, and special-purpose equipment.

82.308, 82.412 Hæmatology

The study of the composition of blood and blood-forming tissues, with emphasis on the cellular constituents and coagulation mechanism, both normal and abnormal.

82.309, 82.413 Medical Radiography

This course, given concurrently with 82.304 and 82.407, covers in detail routine and special radiographic, operating-room, and mobile radiographic techniques. The use of contrast media is included. Image recording cameras and other recording media are studied in depth.

82.310 Not allocated.

82.311, 82.414 Radiobiology and Protection

A study is made of ionizing radiation and its biological effect. Local, systemic, and genetic effects are considered. Also studied is the significance of maximum permissible exposures, the extent of radiation hazards, radiation monitoring, and the means of protection. The basic principles of radiation therapy are considered.

82.312 Introductory Principles of Immunology

A basic course designed to give a student encountering immunology for the first time, a general background in the broad field of immunology.

The course deals with the body defences in disease, types of immunity, biologicals used, nature and function of antigens and antibodies, mechanics of antigen-antibody reactions, hypersensitivity and allergy, and tissue transplantation.

82.313 Biochemistry and Physiology for Medical Laboratory Technologists

This course is concerned with specific physiological, anatomical, and biochemical processes of interest to the medical laboratory technologist. Particular reference is made to structure and the metabolic and hormonal functions of the urinary, gastro-intestinal, cardiovascular, and respiratory systems.

82.314, 82.409 Medical Microbiology and Parasitology

A detailed study of the classification, morphological identification, and physiology of bacteria, fungi, viruses, and parasites, with emphasis on the human pathogens and their relationship to disease. Laboratory preparation of specimens and media, sterilization techniques, culturing methods, and serological characteristics of micro-organisms.

82.315, 82.402 Pathology for Medical Isotope Technologists

A study of common pathological conditions of various systems of the human body which are of significance to the medical isotope technologist.

82.316, 82.415 Biomedical Electronics

A study of electronic and special instrumentation used in the health sciences. Emphasis is placed on laboratory work at the Institute.

82.317, 82.430 Physiology for Biomedical Electronics Students

A review of human physiology, with emphasis on the cardiovascular, nervous, respiratory, muscular, and urinary systems.

82.318, 82.417 Health Statistics

This course examines the collection, arrangement, analysis, and presentation of health statistics. Special areas of consideration will include health patterns in the community, birth and death rates, and disease and accident trends.

82.319 Not allocated.

82.320 Medical Surgical Nursing, Acute

This course is designed to give the student experience in solving the more complicated nursing problems involved with intensive-care nursing, coronary-care nursing, and acute surgical nursing.

82.321 Clinical Experience in Medical-Surgical Nursing, Acute

Taken concurrently with 82.321, this clinical course provides the student with the opportunity to pratise specific skills and apply knowledge gained in the classroom to selected situations in the hospital.

82.322 Family Care Nursing

The course orients the student to the needs of the family during the maternity cycle as these needs are related to the normal physiological changes that occur. The pathology of the ante-, intra-, and post-partum periods is studied. Common childhood ailments are considered. The problem-solving method is used in identifying the family's needs.

82.323 Clinical Experience in Family Care Nursing

Clinical experience taken concurrently with 82.322 provides the student with the oportunity to become increasingly involved in identifying and meeting the family's needs. Learning opportunities involving increased depth in application of communicative and motor skills are provided.

82.324 Professional Nursing

This course is designed to orient the nursing student to the evolution of nursing, past, present, and future. Nursing is related to sociological trends, and emphasis is placed upon educational patterns and nursing practices.

82.325, 82.418 Measurement Techniques in the Isotope Laboratory

This course is conducted entirely in the isotope laboratory. It is designed to give the student actual experience in the use of the various radiation measuring devices in common use. Practice is gained in the use of ionization chambers, Geiger-Mueller counters, proportional counters, scintillation counters, and scanning equipment.

82.326, 82.426 Applied Physiology in Diagnosis and Therapy

This course covers the in-vivo and in-vitro use of radioactive tracer materials. It includes a study of the pharmaceutical considerations—purity and stability of radioactive materials necessary for their clinical use. Also considered are the methods, techniques, and equipment used in the study of the thyroid and endocrine glands, the blood, iron metabolism, the circulation, body water and electrolytes, malabsorption syndromes, the urinary tract and the liver, pancreas and spleen. A detailed study is made of the physiology involved. The techniques and equipment used in scanning studies are considered.

82.327, 82.427 Clinical Experience in Diagnostic and Therapeutic Isotope Procedures

This course runs concurrently with 82.326 and 82.426. The student acquires a broad knowledge of medical isotope techniques by applying classroom and laboratory training in actual clinical situations in affiliated hospitals and clinics.

82.401 Pathology for Medical Radiographers

This course provides a basic knowledge of common pathological conditions. A study is made of the effect of such pathology upon the technical factors used in radiography.

82.402 *See* 82.315.

82.403 Principles of Medical Organization and Management

An introductory course to initiate the student into the principles of organization and management in a hospital. Emphasis is placed on the co-ordination and integration of functions. The use of data as a management tool is studied.

82.404 *See* 82.301.

82.405 *See* 82.305.

82.406 Clinical Chemistry

This course for medical laboratory technologists is designed to enable them to become familiar with the various tests and methods of assaying biological specimens. Emphasis is placed on the chemical principles of the tests and on the practical aspects and sources of error.

The chemical analyses of serum, plasma, whole blood, C.S.F., urine, and fæces, using various methods (including automation) for all tests performed in a modern clinical chemistry laboratory.

82.407 *See* 82.304.

82.408 Blood Banking

The theories of antigen-antibody reactions with detailed study of important blood-group systems encountered in cross-matching; methods of collection, storage, and precautions employed in blood transfusion services.

82.409 *See* 82.314.

82.410 *See* 82.306.

82.411 *See* 82.307.

82.412 *See* 82.308.

82.413 *See* 82.309.

82.414 *See* 82.311.

82.415 *See* 82.316

82.416 Clinical Experience in Biomedical Electronics

Demonstrations and field investigations are carried out concurrently with 82.415 by arrangement with local health agencies.

82.417 *See* 82.318.

82.418 *See* 82.325.

82.419 Communicable Disease Control

The 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 specific diseases of provincial and national importance and epidemiological methodology.

82.420 Medical-Surgical Nursing, Long Term

This course is designed to give the student experience in solving the problems frequently encountered in long-term illness. Emphasis is placed upon the use of community resources and rehabilitative concepts.

82.421 Clinical Experience in Medical-Surgical Nursing, Long Term

Taken concurrently with 82.420, this clinical course provides the students with the opportunity to develop attitudes, skills, and to apply knowledge generally associated with long-term illness. Experiences are gained in a variety of clinical areas.

82.422 Subject discontinued.

82.423 Subject discontinued.

82.424 Psychiatric Nursing

The course introduces the student to the field of psychiatric nursing. Emphasis is placed on communications and interpersonal skills as they are related to patients exhibiting the more maladaptive forms of behaviour.

2.425 Clinical Experience in Psychiatric Nursing

Clinical experience taken concurrently with 82.424 provides opportunities for the student to work with psychiatric treatment teams in promoting the interpersonal and social adjustment of phychiatric patients in active-treatment hospitals and selected community agencies.

82.426 *See* 82.326.

82.427 *See* 82.327.

82.428 Radioisotopes in Therapeutic Procedures

This course covers the application of radioactive isotopes to radiation therapy from the point of view of the technologist. The use of isotopes in the treatment of thyroid disease, blood diseases, and malignancy is considered. Study is made of the application and handling of radiocolloids. Also covered is the use and handling of radioisotopes as external and implanted sources of radiation.

82.429 Basic Patient Care

This course will focus on the patient and his health problems. The student will gain some understanding of the functions of a hospital and methods employed to provide safety and comfort. Skills in observation, communication, and methods whereby the student can assist in unusual situations will be discussed.

82.430 *See* 82.317.

82.431 Summer Term Nursing Practicum

This course is designed to provide additional clinical practice in a variety of areas, with emphasis upon development of leadership skills.

BUSINESS MANAGEMENT

90.103 Business Mathematics and Statistics I

Review of basic mathematics; fundamentals of analytic geometry; functions and managerial planning; elements of calculus with business applications; introduction to statistics.

90.104 Mathematics

Review of basic mathematics and limited amount of new theory with objective of bringing all students up to a common level as a base for later courses. Topics include a review of algebra and analytical geometry, logarithms, trigonometry, and a brief introduction to the concepts of calculus.

90.105, 90.205 Statistics in Broadcasting

The use of statistical analysis. Frequency distributions, graphical presentations. Measures of central tendency. Probability, probability distributions. Sampling. Hypothesis testing. Chi-square test. Correlation. Linear regres-

sion analysis. Time series analysis. All techniques will be referenced to marketing, market research problems and radio and TV. measurement techniques. Strong emphasis will be placed on the use of statistics in associated projects.

90.110 Problems Laboratory

An introductory course to initiate the student into the application of known theory. The problems given will be in the areas of business and engineering and will mostly involve mathematics.

90.131 Management in Industry

An orientation in the nature of business in the private enterprise system, embracing forms of business ownership and organization, management, leadership, and business elements of production.

90.135, 90.235 Economics

A 1-year two-term approach to economics, with the aim of furthering an understanding of the organization and operation of our economic environment. The organization for production and distribution of wealth, determinants of prices and costs, and of income and employment, money and banking, the role of government in business and international trade; analysis of supply and demand, national accounts and business cycles; fixed, variable, and marginal costs; and analysis of the business firm under varying conditions.

90.140, 90.240 Accounting

The principles and techniques of a complete accounting cycle covering assets, liabilities, and owners' equity; basic accounting procedures; changes in owners' equity; closing the books; adjustments for accrued revenue, accrued expense, and for revenue and cost apportionments. The construction of working papers and financial statements including merchandise operations. Accounting for proprietorships, partnerships, and limited companies. Procedures and principles applicable to cash, investments, receivables, inventory, fixed assets, and liabilities. Accounting for manufacturing operations and basic cost accounting techniques. The analysis of financial data for management including sources and uses of working capital, cash flow statements and cash forecasting, and departmental and branch operations. Accounting aids to management, budgeting and profit planning. Consolidated statements. Canadian tax structure and Federal-Provincial tax arrangements. Income tax. All students are required to complete a practice set during the second term.

90.150 *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 unit record equipment. Elementary computer programmes will be written and tested on the 1620 computer. Use of flow-charting and elementary data-processing systems design will illustrate the achieving of data-processing objectives.

90.152 Unit Record Data Processing

A brief introduction to unit record equipment and its use. Elementary wiring and systems design will be included.

90.160 Introduction to Computer Programming

An introduction to the principles of programming using the I.B.M. 1620 computer. Emphasis is on the understanding of the mode of operation of a programme through the media of machine language and assembler language, on the acquirement of "hands on" experience, and practice in the flow-charting, coding, debugging, and documenting of simple business applications.

90.170, 90.270 Marketing

An introduction to the marketing environment and marketing institutions; detailed study of the basic marketing functions, market research, product planning, selection of trade channels, merchandising, advertising and sales promotion, salesmanship. Emphasis on marketing of industrial as well as consumer goods.

90.171 *See* 90.170, 90.270.

90.182 Office Equipment

An introduction to the capabilities of the commonly used machines—adding and calculating machines, cash registers, copiers and duplicating equipment, microfilming, dictating equipment, etc. Operating skill with the adding and calculating machines only is included.

90.203 Business Mathematics and Statistics II

Discounts, mark-ups, margin, selling price, mark-downs; simple interest, compound interest; discounting negotiable instruments; instalment purchases; depreciation; insurance; frequency distributions, averages, index numbers, probability, linear correlation, reliability, and sampling.

90.204 Statistics in Business

A comprehensive study of statistical techniques with a strong emphasis on business and industrial applications. Topics include probability theory, measures of central tendency, measures of dispersion, hypothesis testing, sampling, simple regression, and correlation.

90.205 *See* 90.105.

90.210 Applied Programming

Instruction will be given in Fortran programming, which will then be used by the student in solving problems in engineering and business.

90.221 Psychology

This subject introduces the student to the known fundamentals of human behaviour so that he might understand more clearly work in the personnel field. Studies include the social and industrial aspects of the subject.

90.230 Business (for Engineering and Process Technologies)

Designed to give students enrolled in the engineering and processing technologies a basic appreciation of the complex world of business both from an economic and from an organizational point of view.

90.231 *See* 90.131.

90.232 Administrative Practices

A study to give the student an introductory insight into the basic nature of business problems and into the administrative processes involved in handling them. Problems in all of the several business areas will be

examined, with emphasis on the personnel management aspects of these fields. Study and discussion will be undertaken of actual business situations selected to illustrate typical problems met in industry requiring managerial analysis, decision, and action.

90.235 *See* 90.135.

90.240 *See* 90.140.

90.245 *Credit and Collections*

Study of various types of credit and their use by retail businesses, commercial enterprises, and consumers. Includes sources of information, credit policy and control, and collection techniques.

90.250 Principles of Computer Programming

A detailed study of the fundamental principles and techniques common to the programming of electronic computers. The student will programme numerous business problems using an I.B.M./360 computer. Included will be basic assembler language, flow-charting, file updating, indexing, table look-up, sub-routines. The student will be expected to analyse problems, organize solutions, design the report output, then code, assemble, test, debug, and document his programme according to acceptable standards and control.

90.252 Computer Systems I

Introduction to computer systems design and basic systems analysis techniques. Emphasis is on punched-card computer applications to payroll, billing, and other accounting and statistical functions. Techniques of systems flow-charting, forms design, and card design will be practised.

90.260 Basic Law

An examination of the legal system with special reference to contemporary problems followed by an in depth study of defamation as an example of substantive law.

90.270 *See* 90.170.

90.271 Selected Marketing Institutions

A detailed examination of marketing agents, wholesalers, brokers, co-operatives, and research agencies, as they relate to the distribution of goods and services.

90.275 Salesmanship

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

90.296 Office Systems and Procedures

An introduction to manual, one-write, keysort, and machine systems covering such applications as billing, sales analysis, accounts receivable, accounts payable and expense distribution, inventory, payroll distribution, and payroll writing. A practice set in one-write form is to be completed by all students. The course also provides a brief introduction to the interrelationships of the basic functions such as purchasing, receiving, stock-keeping, production, selling, disbursing.

90.304, 90.404 Quantitative Methods for Management

Study of the applications of mathematics in decision-making in business. Break-even analysis, some additional probability, decision-making, scientific inventory management including EOQ, reorder points, and statistical forecasting. An introduction will also be given to vectors, matrix algebra, linear programming, and queueing theory.

90.305 Calculus with Business and Technical Applications

Calculus with emphasis on its practical use as an extension of other branches of mathematics in business and technical problems. Basic concepts, derivatives with applications, maximum-minimum problems and optimization, differentials, integrals with applications, partial derivatives, curve fitting with applications in statistics, series, differential equations.

90.306 Probability and Mathematical Statistics

Modern statistics with emphasis on probability and inference. Course includes probability theory, Bayes' theorem, sampling, hypothesis testing, confidence limits, regression, and correlation.

90.314 Work Measurement

Introduction to work study and the application of the basic principles to business and industry. Work content. Productivity. The need to measure. Performance rating. The theory and practical application of time study. Production studies. Rated activity sampling. Predetermined motion-time systems. Analytical estimating. Standard data systems. Supplemented by frequent field trips to enable the student to apply the techniques under existing business and industrial conditions.

90.315 Method Study

Introduction to the principles of method study and motion economy. Selection of study areas. Techniques of record—the charting of work using outline, operation, flow, and two-handed process charts. Flow diagraming, multiple activity charts, the use of graphs. Principles of plant layout and materials handling. The application of critical examination in the systematic solution of design and production problems. Supplemented by frequent field trips to enable the student to apply the techniques under existing business and industrial conditions.

90.316 Systems and Procedures Analysis

Method study of office procedures. The organization and function of a systems and procedures department. Systems charting. Work distribution, procedures analysis, forms analysis. Forms design and control. Work measurement. Work simplification. Office layout. Manuals. Report writing. Supplemented by frequent field trips to enable the student to apply the techniques under existing business and industrial conditions.

90.321 Psychology *See* 90.221.

90.322 Human Relations

Study of the human elements in the operation of all enterprise; the nature of individual behaviour, interaction between individuals and organizations, group dynamics, and leadership.

90.325 Industrial Relations

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

90.332, 90.432 Estate Management

The real-estate function—land 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. Building construction and property development; institutional lenders and the mortgage market. Practical aspects of the syllabus will include studies of the functions of the real-estate agent, salesman, and appraiser.

90.333 Industrial Processes

A special course designed to familiarize students with the principal extractive, process, manufacturing, and service industries of British Columbia Major emphasis on the marketing, production, and financial aspects of these industries with strong back-up in films and guest lecturers.

90.341, 90.441 *Cost and Managerial Accounting*

The accountant's role in the organization; major purposes of cost accounting; cost-volume-profit analysis; job order costing; process costing; standard costs; budgeting, responsibility accounting; direct costing; capital budgeting; joint and by-product costs; non-manufacturing costs; inventory; accounting systems; payroll.

90.342, 90.442 Retail Merchandise Accounting

Departmental, branch, and agency accounting systems. Consumer credit, instalment sales and consignment sales procedures. A comprehensive study of the solution of the mathematical problems of retail merchandising; i.e., profit calculation, mark-up, retail prices, price policies and lines, mark-downs, inventory, expenses, and budgeting. The role of accounting in retail merchandise management.

90.343 Cost Accounting

Direct costing and the contribution approach; cost-volume-profit analysis; cost analysis for managerial planning and decisions; process job-order, joint, and by-product costing; inventory planning, control, and valuation; budgeting and profit planning; standard costs; cost and price variance analysis; capital budgeting.

90.346, 90.446 Auditing

Basic auditing procedures. Features of the internal control system. The audit programme. 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.

90.347, 90.447 Financial Accounting

Review of accounting procedures, the accounting cycle, and the preparation of financial statements. Net income concepts, capital stock, surplus and dividends, accounting principles, cash, receivables, inventories, investments, fixed assets, liabilities and reserves, analysis of working capital, application of funds. Statement from incomplete records, reorganization schemes, price level impact on financial statements.

90.350 S/360 Assembler Programming

Continuation of 90.250. A detailed study of computer programming capabilities using the full instruction set of the System/360 Assembler language, establishing detailed programming, label, flow-chart, report layout, and documentation standards. Introduction to input/output control system and to the operating system. The student will write numerous programmes employing card, printer, tape, and disk files.

90.351 Scientific Computer Programming

An introduction to the principles and technical applications of digital electronic computers in industry. Students will use the computer to solve a problem in their own technological field.

90.352 Data Processing Applications

A study of the application of data-processing principles to accounting and statistical functions, including accounts receivable, billing sales analysis, inventory control, accounts payable, and payroll.

90.360, 90.460 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.

90.361, 90.461 Finance

An investigation of different methods of raising funds for new and existing businesses, corporate and non-corporate. Business risk and uncertainty. Analysis of the importance of financial institutions. Business promotion. Security analysis. Capital budgeting. Decision-making analysis. Surplus, dividend, and reserve policy. Business failure.

90.362 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 technologist is likely to come in contact with in carrying out his duties. Special attention will be given to selected public health legislation.

90.364 Financial Intermediaries

The functions and economic significance of the major financial institutions in the economy that make funds available to consumers, business, and governments. The course covers such institutions as banks, credit unions, trust and loan companies, finance companies, mortgage companies, and various government lending agencies. Analysis of each institution and the part it plays in providing short, intermediate, and long-term credit needs of the users of funds.

90.365, 90.465 Money and Banking

The study of money and money substitutes, the supply of currency, the creation of credit. The functions and uses of money. Practices, policies, functions, and services of commercial banks. Regulation and control of the banking system. Economic and social importance of the banking system. A study of the demand for and the supply of short-term funds. Analysis of various money-market instruments such as government securities, bankers' acceptances, short-term notes, commercial paper, and other money-market instruments.

90.373, 90.473 Advertising and Sales Promotion

Introduction to advertising and sales promotion. Psychology of advertising, preparation of copy, layout, media selection, strategy, and campaign planning. Organization for sales promotion.

90.374, 90.474 Marketing Research

The purpose of this course is to teach the student to make the most effective use of marketing research in business. The course first examines the principal areas in marketing where research can be most useful. Detailed analysis is then made of the steps involved in a research programme. The various research organizations and agencies in Canada are surveyed in relation to the types and kinds of work they do. Students will be required to carry out a research project as a practical exercise.

90.381 Communication Systems

Study of the physical methods of communication, including mail, telegraph, telephone, radio, and television.

90.383 Wholesaling

Examination of the place of wholesaling in over-all marketing picture; to assess the importance of the various forms of wholesaling. An integrated management approach to the operations of a wholesale business is used.

90.384 *Retailing*

An examination of the various facets of retailing such as store location, layout, design; store operations; planning and managing the sales attack; retail selling; the various types of retail distributors, their strengths and weaknesses, adaptation to the rapid pace of change.

90.385 Fashion and Æsthetics

Principles of line and design, proportion; fabrics, colour; history of fashion, fashion cycles.

90.386 *Exports and Imports*

A study of the mechanics of international trade; foreign exchange rates; balance of international payments; tariff duties on imports, import quotas; and European Common Market characteristics. Product-distribution-promotion mix for export markets of Canadian industry with emphasis on U.S.A. market influences. The economic, cultural, and political considerations involved in adapting fundamental domestic marketing techniques to foreign conditions.

90.387 Market Planning

This advanced course in marketing is designed to augment the work done in the introductory marketing course. Students will study intensively the marketing concept and the role of marketing management, the dynamic aspects of the Canadian markets, the problems and analytical processes of product planning and development. Extensive use is made of case studies and assignments to simulate business conditions as closely as possible.

90.389 Consumer Behaviour

An examination of the major principles of human behaviour as they apply to groups, particularly as the principles are observed in business and industrial settings. Areas such as communication, persuasion, prejudice, cultural attitudes affecting group dynamics, and the self-concept are considered.

90.390 Introduction to Work Study

A 40-hour single-term appreciation of fundamental work-study techniques. Emphasis on the method-study techniques with minimal time on work measurement. Basic approaches to problem solving and simplification of work in order to effect improvement through product improvement, reduced labour content, and reduced cost.

90.391 Work Study I

An introduction to the principles and application of method study in business and industry. Subjects include work content, productivity, problem solving, selection of study areas. Techniques of record include activity (work) sampling, work distribution, outline and flow process charting. Plant layout and materials handling. Motion economy. Work simplification.

90.396 Computer Systems II

Introduction to the principles and techniques of systems analysis: gathering data, systems design, flow charting, documentation, procedures, card and form design, controls, audit trails. The use of a high-level language (Fortran IV) in solving business and statistical problems involving internal sorting, table look-up and binary search. Case study: design of a total information system.

90.407 Numerical Methods and Fortran Programming

Error analysis, iterative methods, approximations, interpolation, solution of simultaneous linear equations, numerical solution of differential equations, numerical integration. Emphasis will be on computer applications of these methods in Fortran language.

90.408 Linear Algebra and Applications

Vector and matrix manipulation as an introduction to linear programming.

90.409 Introduction to Operations Research

An introduction to some established methods of operations research. Linear programming, simulation, Monte Carlo method, waiting lines, inventory problems, quality control, work sampling, performance and cost evaluation, PERT and CPM.

90.410 Business Engineering Problems

This course will require the application of knowledge gained in other courses to the solution of business problems. The lecture series will familiarize the student with systems used in industry in such areas as scheduling, materials handling and plant layout, inventory management, estimating, and transportation. Students will be required to do basic research to collect information for project assignments as well as to solve case studies.

90.412 Industrial Organization and Operations

Study of the various departments of a business enterprise, their objectives, functions, and relationship to each other in a systems sense. These will include sales, purchasing, engineering, production, product research, personnel, accounting, administrative services. Each of these areas will be supported through case analysis.

90.417 Materials Handling and Control Equipment

An introduction to the common types of industrial equipment. The student will examine the basic principles of operation, their characteristics and usage.

90.424 Personnel Administration

An introduction to the fundamentals of personnel management, including personnel procedures, tools and records, job descriptions, recruiting, interviewing, testing, selection, orientation, training, wage and salary administration, promotion and transfers, benefits, and morale.

90.425 Industrial Relations

A detailed analysis of selected labour-management problem areas with emphasis on the solution of practical existing problems in industrial relations.

90.427 Manpower Selection and Placement

This subject provides the student with a capability in dealing with problems of selecting and placing individuals both within business enterprises as well as in industry generally. The subject will cover such items as counselling, testing, interview techniques, and various other assessment methods.

90.432 *See* 90.332.

90.434 Managerial Policy

An analysis of business policy formulation designed to give the student practice, experience, and confidence in handling business situations, including those of a complex nature where basic policy decisions are necessary to assist in problem-solving. Typical business cases will be selected from the fields of finance and control, personnel, production, marketing, and general management for study and discussion. Determination of an acceptable course of action will be followed by the development of a proposed scheme of implementation.

90.441 *See* 90.341.

90.442 *See* 90.342.

90.443 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.

90.446 *See* 90.346.

90.447 *See* 90.347.

90.450 Advanced S/360 Assembler Programming and Operating Systems

Continuation of 90.350. Tape programming; disk programming for sequential, index sequential, and direct file organization; input/output control system; use of standard utility, disk/tape sort/merge and autotest programmes; S/360 Assembler Macro language. Considerable time will be devoted to a rigorous study of operating systems—job control language, linkage editor, operating system library maintenance, systems generation, and the supervisor. Introduction to telecommunications programming using BTAM and QTAM. Students will complete numerous programmes, including, as a term project, a comprehensive set of programmes of approximately 2,000 instructions employing the full resources of the on-site I.B.M. System/360 computer.

90.452 Business Computer Programming

An introduction to problem-oriented computer programming using Cobol programming language. Standard accounting applications will be flowcharted, programmed, and tested by the student on an I.B.M. System /360 computer.

90.460 *See* 90.360.

90.461 *See* 90.361.

90.465 *See* 90.365.

90.466 Security Analysis

Techniques and principles of security analysis; valuation of securities. Analysis of investment risks. Investment policy for individuals and business firms.

90.472 Merchandising

Techniques employed in assortment planning; sources of consumer and merchandise information; stock controls, buying and selling calendars, pricing; buying, buying organizations; assortment appraisals.

90.473 *See* 90.373.

90.474 *See* 90.374.

90.476 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.

90.481 Transportation

An introductory study of modern means of transportation in all fields of business activity.

90.488 Transportation and Materials Handling

The field of transportation, storage, and materials handling is an integral part of the distribution system. This course will investigate the Canadian transportation systems, warehousing and other storage, and the materials-handling techniques associated with transportation and storage in our complex distribution system.

90.491 Work Study II

A continuation of Work Study I involving work measurement techniques. Performance rating, time study, production studies, predetermined motion—time systems, analytical estimating, the use of standard data. Procedures analysis with respect to business systems, forms design, office layout, etc. Detailed critical examination of a process or procedure using the systematic approach to effect improvement. The course is supplemented by case problems and projects using techniques learned in both Work Study I and Work Study II.

90.496 Computer Systems III

Methods used in the development of business data processing systems for punched cards, disk storage, and magnetic tape. System specification; equipment appraisal, acquisition, and utilization; implementation and control. These techniques will be applied to the solution of advanced management problems. Compiler language: Cobol will be included in this course.

90.497 Engineering Application Programmes

Familiarization with packaged programmes available for standard engineering applications such as COGO, STRESS, general-purpose systems, simulator, mathematical programming system, etc.

BROADCAST COMMUNICATIONS

91.101, 91.201 Elementary Broadcast Technology

An introduction, for Production Option students, to the equipment used in radio and television broadcasting and to the techniques used in the various processes and procedures in the operation of broadcast stations. Starting with the organization of the industry and stations, the student continues with the study of microphones, turntables, control boards, tape recording, and control-room accessories. At the same time, students study the processes of picture transmission, lighting and lighting equipment followed by picture and wave-form monitors, applied optics, the vidicon, image orthicon and plumbicon cameras, film and slide projectors, video switcher and patch panels, video distribution, video tape recording, and colour television. This course leads to actual radio and television production throughout the second year.

91.103, 91.203, 91.303, 91.403 Writing and Sales

Students require a knowledge of modern advertising methods as well as an understanding of the special techniques of writing for the broadcast media. Lectures and workshop sessions give the student a thorough indoctrination in advertising as used in today's marketing plans. Commercials are studied in all aspects, and the problems facing commercial writers in advertising agencies, stations, and retail organizations, as well as in the advertising departments of manufacturers, are compared, studied, and practised. Those with aptitude or talent for writing receive the groundwork for careers in this field.

91.109, 91.209 Introduction to News

The student in this course will be given his first look at the world of "electronic journalism." The course covers a history of news; newsroom organization and operations in radio and television; news writing and editing, news sources and coverage; production of news broadcasts and special-

interest features. Introduction to News is preparatory to News in the second year, in which these fundamentals are expanded and students actually work in an operating newsroom within the technology. A good percentage of the time in Introduction to News will be spent in the study of current events to provide the necessary background for a qualified newsman.

91.110, 91.210 Broadcast Production

This first-year subject serves as an introduction and background study in several areas connected with radio and television broadcasting. A study is made of the legislation and regulations under which broadcasting in Canada is governed. A first-term study is also made of the history of the development of broadcasting in this country, from the first steps in radio through to present-day radio and television broadcasting. The student is introduced to the use of music in broadcasting and elementary work in the development of programming. The subject includes work in pronunciation and diction, the use of stress, phrasing and projection as applied to work in the industry. A large amount of laboratory time has been assigned to this subject in first and second terms, to lay the foundation for actual work in radio and television production in second year.

91.201 *See* 91.101.

91.203 *See* 91.103.

91.209 *See* 91.109.

91.210 *See* 91.110.

91.302, 91.402 Production—Radio

Students engage in practical work in radio production; the preparation and presentation of programmes, news broadcasts, remote broadcasts, and special-events coverage, in all phases of production from planning through to the finished product. The student gains practical experience in the use of all studio equipment, as well as remote pick-up equipment and portable recording facilities.

91.303 *See* 91.103.

91.305, 91.405 History and Current Events

It is essential for persons in the broadcast industry to have as wide a base of external knowledge as is humanly possible. This course, designed on a partial seminar basis, combining lectures and practical exercises, will deal with present-day happenings on the local, regional, national, and international level. Where possible the practical happenings of today will be directly related to their historical background.

91309, 91.409 News—Radio and Television

News follows the first-year Introduction to News, in which fundamentals are expanded to give professional atmosphere to the training of neophyte "electronic journalists." The students will spend much time refining techniques and actually covering and editing the news. As in the first year, much time will be spent in studying current events as a background to the news as it is happening.

91.312, 91.412 Production—Television

Students engage in the production of television broadcasts, making use of full studio facilities in the production of television commercials, special-events coverage, the taking and editing of film material, and carrying out on-the-job training projects. The laboratories of the Broadcast Communications programme consist of a fully operative television station, equipped with all standard apparatus used in the industry, including video tape recorders, full darkroom facilities, sound-on-film as well as silent motion-picture cameras, and five television cameras, including a colour camera chain, and colour monitors.

91.402 *See* 91.302.

91.403 *See* 91.103.

91.405 *See* 91.305.

91.409 *See* 91.309.

91.412 *See* 91.312.

HOTEL, MOTEL AND RESTAURANT MANAGEMENT

92.101 Front Office Management

Front office organization and psychology. Materials, equipment, and supplies used; rooms salesmanship; reservations, registrations, and front office "accounting" for various-size hotels; handling of cash and credit transactions; the night hand-transcript, and the processing of accounts and the night audit on billing-audit equipment; telephone switchboard.

92.102, 92.202 Food and Beverage Management

Background of industry; hygiene and sanitation; meal planning, menu preparation, basic production systems. Identification, sources and selection of foods; purchasing principles and methods; basic food preparation; culinary terminology; food science. Elementary kitchen layout, equipment specification; maintenance, cost of repairs. Service of food in dining-rooms, snack bars, banquet rooms, lounges. Kitchen and service areas labour cost control; food costing and production control. Menu writing and preparation. Organization of catering department; personnel requirements and administration. Wines, dining-room equipment purchase and storage; introduction to convenience foods and new media of food preparation and service.

92.202 *See* 92.102.

92.203 Bar and Rooms Management

Housekeeping organization and duties; control forms used; supplies and equipment used; specifications for purchasing equipment and linen; laundry operations; beer-parlour organization and control; cocktail-lounge organization, glassware, types of beverages, dispensing devices, and control systems.

92.211 English—Speech

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.

92.302, 92.402 Food and Beverage Management

Advanced food preparation; volume feeding management, menu pricing; kitchen and dining-room interrelation in production and service planning; pre-cost and pre-control, budgeting, standardization, analysis; function and banquet catering, including menu, production, layout, service requirements; special service catering; food processing and production by manufacturers; nutrition, dietetics; equipment purchasing specifications; design and market research; future trends. Organization of a catering department; duties, staffing, work scheduling, responsibilities; function booking; staff training, financial and personnel policies. Steward's department, storage control; china, silverware, glassware, table-linen purchase; specialized food service for hospitals, colleges, institutions, air lines. Environment and atmosphere; management and consultant concept for design and layout; science of food and nutrition for "tomorrow's" operation. Laboratory hours will be devoted to food preparation and dining-room service, as well as design of layout, research on equipment, observation of operations, and analysis of local establishments.

92.312, 92.412 Engineering and Maintenance

Fundamentals of lighting; acoustics; heating; principles of air-conditioning; passenger elevators; electrical systems; fire prevention and protection; plumbing; swimming pools.

92.313, 92.413 Hotel Accounting

Internal control of rooms, food and beverage departments; payroll (labour costing) control; food and beverage purchase, storage, and issuing controls; interpretation of financial statements and comparison and analysis of statistical information; leases, franchises, and financing; hotel and motel evaluations; insurance and income tax.

92.314, 92.414 Planning and Design

Fundamental introduction to blueprint reading; contracts; principles of design for hotels and restaurants; departmental layouts, floor plans, and traffic flows; selection of equipment and furnishings; principles of decoration and colour theory; lighting; sources, specifications, and qualities of furnishings, materials, and fabrics.

92.315, 92.415 Advertising and Promotion

Analysis of market in order to establish a sales promotion programme which will contribute to a more profitable operation. Advertising as part of that total programme—the selection and use of the various media available; the techniques and costs involved. The part played by public relations and publicity; the channels available, the techniques and costs. The use of outside personnel such as advertising agencies and public relations consultants. The organization, duties, and methods of the sales department.

92.316, 92.416 Human Relations

Thought and leadership. Fundamental principles of human relations. Development leading to an understanding of a "belief" relationship. Job analysis, recruiting, interviewing, indoctrinating, training, supervising, managing. Co-ordination of hospitality activities with community—social, charitable, sports, chamber of commerce, organization affiliations. Co-operating with convention bureaux, travel bureaux, and tourists. Management-labour relations.

92.317, 92.417 Law

Contracts—their nature and formation; unlawful contracts, statutes requiring right, reality of consent, misrepresentation, performance, breach, and remedy. Business associations—agency, partnership, and companies. Torts —trespass, negligence, strict liability, nuisance, occupiers and owners of land. Personal property. Reference will be made to the specific Acts covering the hotel industry.

92.320, 92.420 Food and Beverage Control

Internal control of food and beverage sales; labour control; food and beverage purchase, storage and issuing controls; interpretation of food operating statements; Leases, franchises, and financing; insurance and taxation. The course will be specifically for food service operations.

92.321 Food Marketing

Initiation of market and sales research programmes; customer acceptance of product and service; relationship of advertising and marketing; market influence on prices; distribution of goods under a market system; application of marketing to the restaurant and catering industry.

92.323, 92.423 Food Science and Sanitation

The chemistry of fats, carbohydrates, proteins, flavourings, and colourings; food additives; basic nutrition; the causes and prevention of food poisoning; sanitation and hygiene in food preparation and service; sanitation and equipment design and costs; food science and metabolism; human body acceptance of foods and colours; food chemistry in quantity preparation; food processing and man-made edible fibres; spun foods; efficiency foods of tomorrow.

92.402 *See* 92.302.

92.412 *See* 92.312.

92.413 *See* 92.313.

92.414 *See* 92.314.

92.415 *See* 92.315.

92.416 *See* 92.316.

92.417 *See* 92.317.

92.418 French Conversation

A basic, or an advanced, course (depending on the ability of the student) to give some fluency in French conversation. The course will be oriented toward the terms used in the hotel and food business, and will include correspondence. A language laboratory is available to complement classroom instruction.

92.420 *See* 92.320.

92.422 Menu Planning

Contemporary menu writing; basic menu-drafting requirements; relationship of menu layout to food cost, labour cost, and profit; menu language and interpretation; recipes and menus in food production; influence of efficiency foods on menus; types of menus used in the catering industry; menu cover design; calculation of menu sales prices.

92.423 *See* 92.323.

92.424 Food Facilities Design

Planning of production and service areas; construction standards; economics of motion in layout; environment and design; interior decor; sound and light control; air-conditioning; power and heating systems; design and traffic flow; mechanization and transportation of supplies in a production area; furnishing and equipment design.

92.425 Restaurant Law

A brief examination of the legal system in Canada, followed by a study in depth of various aspects of criminal, tort, contract, and property law related to the restaurant industry.

Printed by A. SUTTON, Printer to the Queen's Most Excellent Majesty
in right of the Province of British Columbia.
1969

30M-1268-21