BRITISH COLUMBIA
INSTITUTE OF TECHNOLOGY

British Columbia Institute of Technology

3700 Willingdon Avenue
Burnaby 2, British Columbia
Telephone: 434-5722

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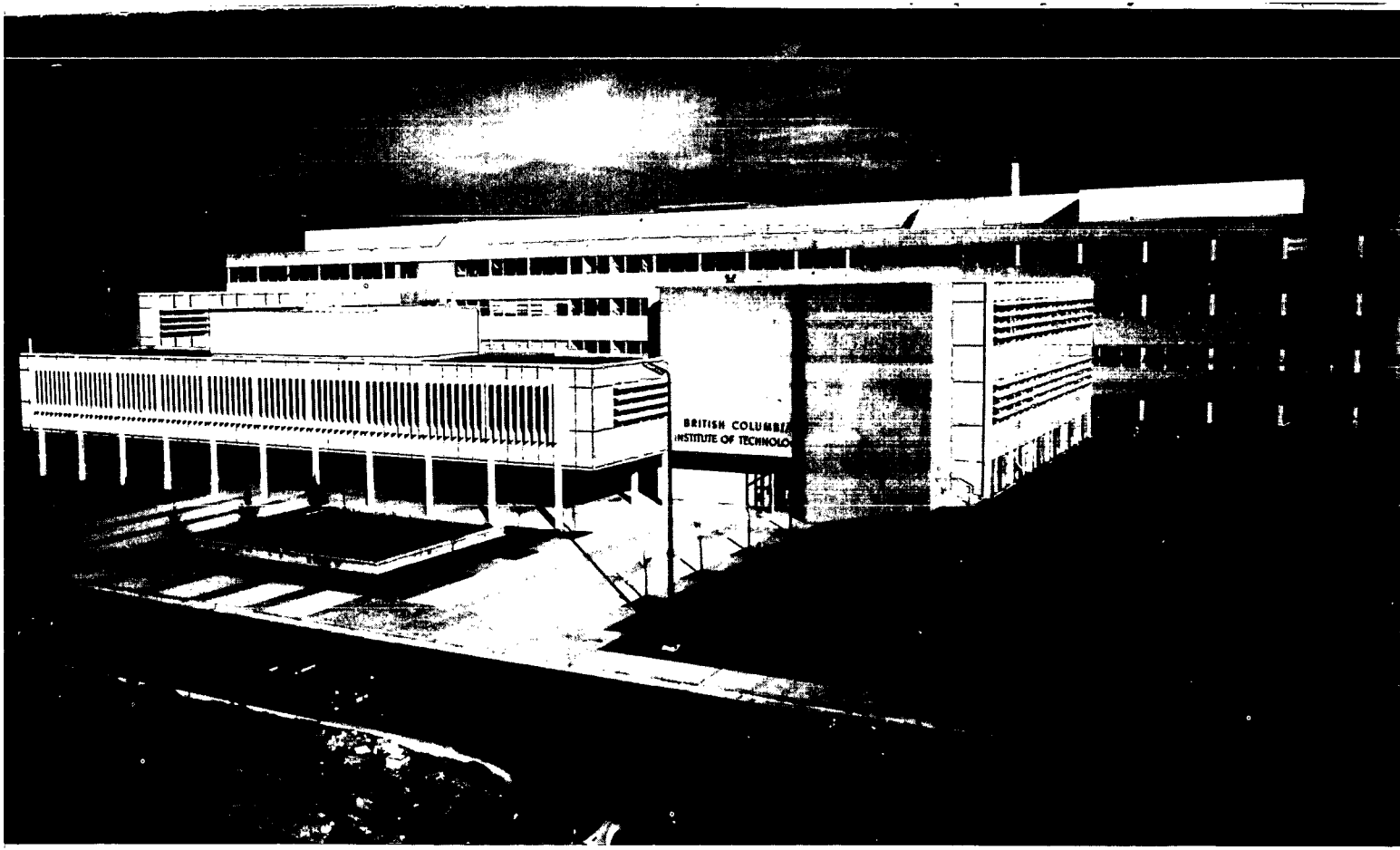
The British Columbia Department of Public Works acted either as consultant on or prime designer of all buildings.


BRITISH COLUMBIA
INSTITUTE OF TECHNOLO

THE HONOURABLE LESLIE R. PETERSON, Q.C.
Minister of Labour and Education

Aims and Objectives

The British Columbia Institute of Technology is an institution for advanced education, the first of its kind in British Columbia. It is founded on the following resolutions:

Improvement in the art of understanding, controlling, and using the forces of nature for the benefit of humanity is a necessity.

All individuals on the Institute staff, without regard to rank or age, will teach their juniors, co-operate with their equals, and learn from their seniors with full realization of their responsibility to society and full awareness of the need for ethical behaviour.

The programmes will demand ability, strong motivation, and serious effort and application on the part of the student.

Education of technicians at the post-secondary school level should develop the ability to apply engineering, scientific, business, or professional concepts to trade, industry, commerce, or professional operations in the chosen field. The training must not be so narrow that it prohibits reasonable understanding of professional concepts nor so broad that it precludes ability to deal practically with specific technical matters.

This requires a proper balance between the theoretical and practical aspects of the training and presupposes the length of the course to be completely adequate to provide the required foundation for the chosen career.

It is the aim of the Institute to produce graduate technicians who, with additional experience, will rapidly assume responsible supervisory or managerial positions in business or industry. Their particular interests and abilities should be in the practical and technical aspects of engineering or business rather than in the development of new basic principles. Consequently, it is expected that they will provide liaison between the professional and the craftsman.

E. CECIL ROPER, B.SC., M.B.A., P.ENG.
Principal, British Columbia Institute of Technology

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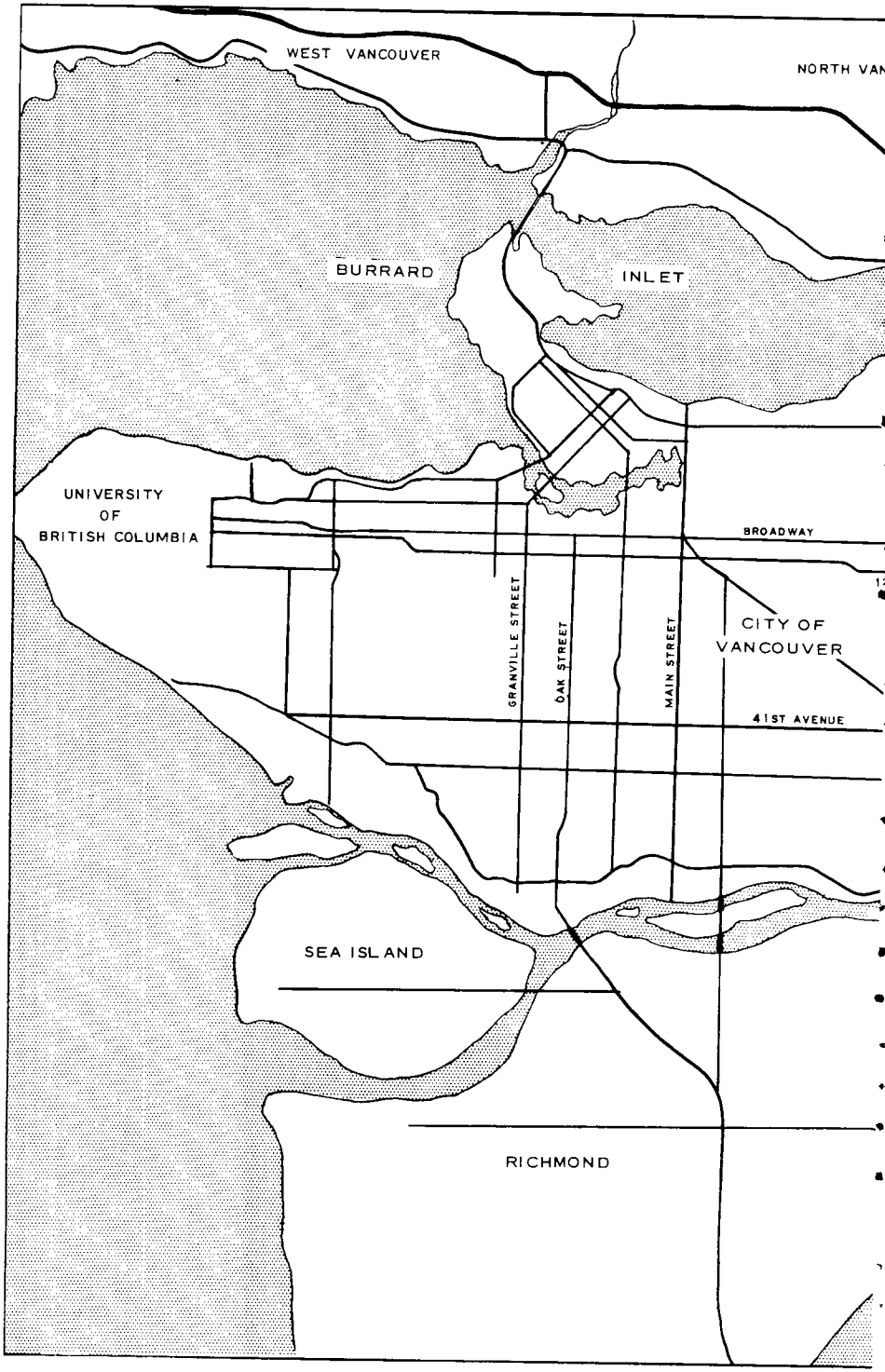
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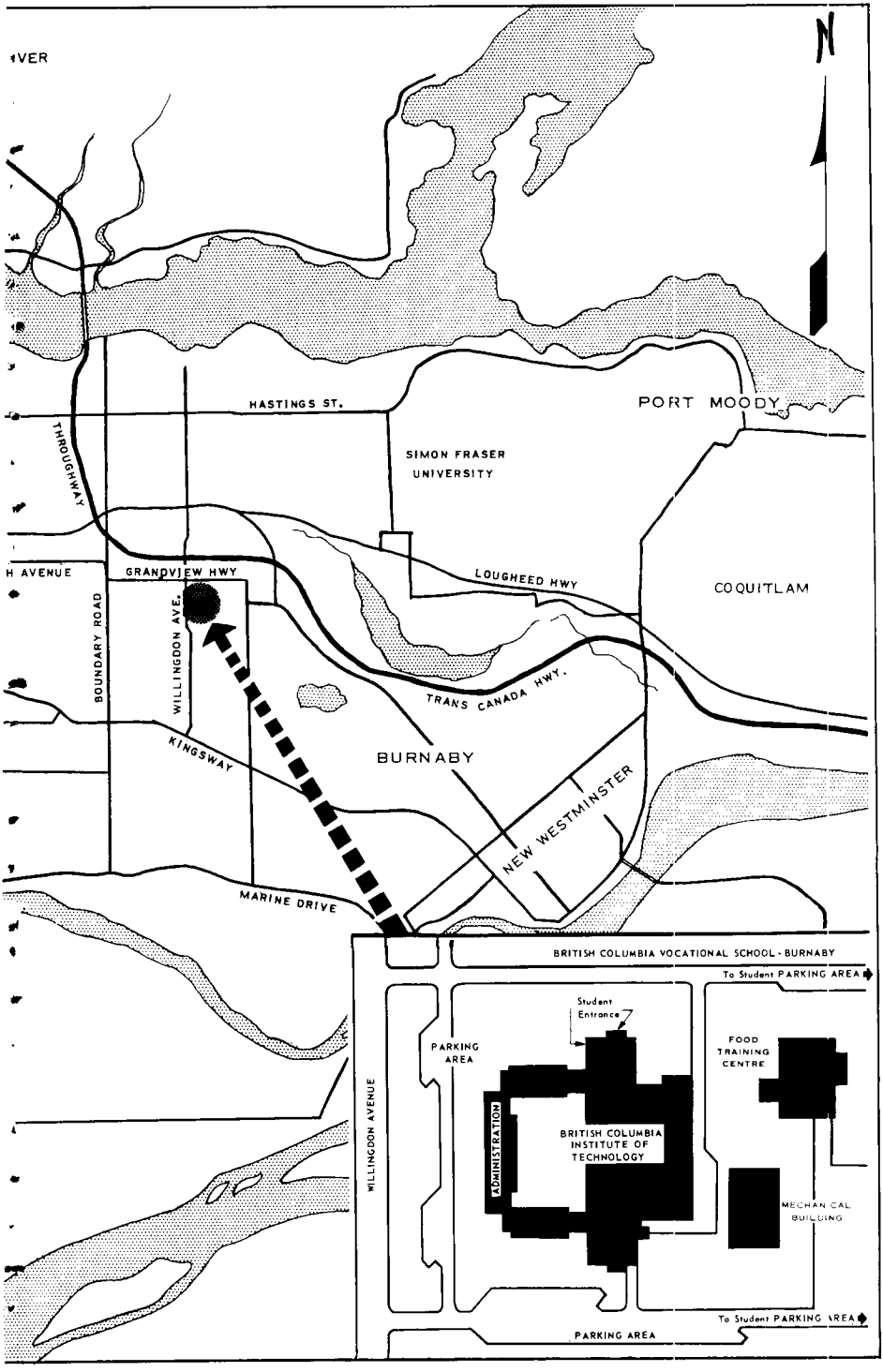
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E. H. TARRANT, P.ENG., Planning and Development Engineer, MacMillan, Bloedel and Powell River Limited, Vancouver.

WILLIAM H. THOMPSON, Sales Manager, L. A. Varah Ltd., Vancouver.

BERTRAM R. TUPPER, P.ENG., Vice-President, Staff Engineering, British Columbia Telephone Co., Vancouver.

FOOD PROCESSING ADVISORY COMMITTEE

Chairman:

E. L. WATSON, P.ENG., Associate Professor, Department of Agricultural Engineering, University of British Columbia, Vancouver.

Ex Officio:

R. B. HYDE, Head, Food Processing Technology, British Columbia Institute of Technology, Burnaby.

Members:

W. CAMPBELL, William Robinson Ltd., North Burnaby.
E. L. DEVLIN, Regional Director, Department of National Health and Welfare, Food and Drug Directorate, Vancouver.
K. A. DEVLIN, Director of Laboratories, Fraser Valley Milk Producers' Association, Vancouver.
C. C. STRACHAN, Director, Research Station, Canada Department of Agriculture, Summerland.

FORESTRY ADVISORY COMMITTEE

Chairman:

C. B. DUNHAM, Vice-President, Forest Operations, Columbia Cellulose Co. Ltd., Vancouver.

Ex Officio:

V. HEATH, Head of Forestry and Forest Products Technologies, British Columbia Institute of Technology, Burnaby.
G. R. HARRIS, Forest Products Technology, British Columbia Institute of Technology, Burnaby.

Members:

L. A. DEGRACE, President, Industrial Forest Services, Prince George.
R. R. DOUGLAS, Vice-President, Forest Operations, Rayonier Canada (B.C.) Ltd., Vancouver.
I. C. MACQUEEN, P.ENG., President, Forestal Forest & Engineering Ltd., Vancouver.
A. Moss, Woodlands Manager, S. M. Simpson Ltd., Kelowna.
N. WALTON, MacMillan, Bloedel and Powell River Limited, Foot of Cromwell Street, Vancouver.
R. W. WELLWOOD, P.ENG., Professor, Faculty of Forestry, University of British Columbia, Vancouver.

FOREST PRODUCTS ADVISORY COMMITTEE

Chairman:

J. E. LIERSCH, P.ENG., Vice-President, Canadian Forest Products Ltd., Vancouver.

Ex Officio:

V. HEATH, Head of Forestry and Forest Products Technologies, British Columbia Institute of Technology, Burnaby.
G. R. HARRIS, Forest Products Technology, British Columbia Institute of Technology, Burnaby.

Members:

JOHN G. BENE, Weldwood of Canada Ltd., 777 East Third Avenue, Vancouver.
G. DUDLEY DARLING, Comptroller, Seaboard Lumber Sales Co. Ltd., Vancouver.
NORMAN R. DUSTING, Manager, British Columbia Lumber Manufacturers' Association, Vancouver.
KENNETH G. FENSOM, Forestry and Wood Products Consultant, Vancouver.

THOMAS N. FINICAL, Manager, Vancouver Paper Mills, MacMillan, Bloedel and Powell River Limited, New Westminster.

THOMAS B. HARGREAVES, Resident Manager, Elk Falls Co. Ltd., Campbell River.

KEITH E. LACHANCE, P.ENG.(ONT.), Manager, Fibre Products Development, MacMillan, Bloedel and Powell River Limited, South Burnaby.

D. J. MACLAURIN, Department of Chemistry, University of Victoria, Victoria.

JOHN G. PRENTICE, President, Canadian Forest Products Ltd., Vancouver.

R. H. (BUCK) RICHMOND, P.ENG., Northwood Mills Ltd., Prince George.

JAMES A. ROBINSON, Manager, Canadian Forest Products Ltd., Eburne Sawmills Division, Vancouver.

W. MICHAEL ROBSON, Product Manager—Plywood, MacMillan, Bloedel and Powell River Limited, Vancouver.

E. C. SHERMAN, General Superintendent, Canadian Forest Products Ltd., Howe Sound Pulp Division, Port Mellon.

MORRIS WAYMAN, Professor of Chemical Engineering, University of Toronto, Toronto, Ont.

ROBERT W. WELLWOOD, P.ENG., Professor, Faculty of Forestry, University of British Columbia, Vancouver.

GAS AND OIL ADVISORY COMMITTEE

Chairman:

COL. J. W. INGLIS, P.ENG., Principal, British Columbia Vocational School, Burnaby.

Ex Officio:

I. ANDERSON, Gas and Oil Technology, British Columbia Institute of Technology, Burnaby.

Members:

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

K. W. JONES, P.ENG., Shell Canada Ltd., Shellburn Refinery, Burnaby.

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

H. T. LIBBY, P.ENG., Manager, Gas Division, British Columbia Hydro and Power Authority, Burnaby.

J. D. LINEHAM, P.ENG., Director of the Petroleum and Natural Gas Division, Department of Mines and Petroleum Resources, Victoria.

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

V. WIEBE, P.ENG., Vice-President, Standard Oil Co. of B.C., Burnaby.

HOTEL, MOTEL AND RESTAURANT MANAGEMENT ADVISORY COMMITTEE

Chairman:

J. ROY CORBETT, Managing Director, British Columbia Hotels' Association, Vancouver.

Ex Officio:

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

Members:

MAX AMMANN, Manager, Waldorf Hotel, Vancouver.

E. J. BODNARCHUK, Lucky Strike Motel Hotel, Vancouver.

GEORGE A. CRAN, Secretary, Hotel Operators' and Innkeepers' Society of British Columbia, 1509 Dunbar Street, Vancouver.

GORDON L. MUNRO, Manager, Blue Boy Motel Hotel, Vancouver.

G. NICHOLAS NORTH, Manager, Imperial Inn, Victoria.

TEVIE S. SMITH, Manager, Chipper's Drive-ins Ltd., Richmond.

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

CHARLES INDERMUEHLE, General Manager, Bayshore Inn, Vancouver.

REG C. BROOME, President, Food Service Executives' Association, c/o Tally-Ho Motor Lodge, Nanaimo.

MRS. ANN MAYER, Secretary, Executive Housekeepers' Association, c/o 1375 Nicola Street, Vancouver.

INSTRUMENTATION AND CONTROL ADVISORY COMMITTEE

Chairman:

G. JANSEN, Engineer, Technical Services, Shell of Canada Ltd., Burnaby.

Ex Officio:

J. O. HULBERT, P.ENG., Head, Instrumentation and Control Technology, British Columbia Institute of Technology, Burnaby.

Members:

R. ANDERSON, Engineer, H. A. Simons Ltd., Vancouver.

R. M. CUTHBERT, Division of Physics, British Columbia Research Council, Vancouver.

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

J. J. GAREY, British Columbia Forest Products Ltd., Pulp Mill, Crofton.

E. M. PRICE, Senior Technician, Physics Department, University of British Columbia, Vancouver.

W. G. SMALL, P.ENG., Chief Instrument Engineer, Consolidated Mining and Smelting Company of Canada Limited, Trail.

LIBRARY ADVISORY COMMITTEE

Chairman:

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

Ex Officio:

MRS. J. M. JORGENSEN, M.L.S., Librarian, British Columbia Institute of Technology, Burnaby.

Members:

I. F. BELL, Associate Librarian, University of British Columbia, Vancouver.
ANN BREARLEY, Librarian, Science Division, University of British Columbia, Vancouver.
MRS. MARIA Z. I. MCDOUGALL, Head, Science and Technology Division, Vancouver Public Library, Vancouver.
W. S. LANNING, Associate Professor and Director of Curriculum Laboratory, University of British Columbia, Vancouver.
ANNA R. LEITH, Head, Science Division, Library, University of British Columbia, Vancouver.

MECHANICAL ADVISORY COMMITTEE

Chairman:

E. C. ROPER, P.ENG., Principal, British Columbia Institute of Technology, Burnaby.

Ex Officio:

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

Members:

P. N. BLAND, P.ENG., H. A. Simons International Ltd., Vancouver.
R. BREWER, Plant Manager, Gearmatic Co. Ltd., Surrey.
D. F. GUNNING, P.ENG., Project Engineer, Western Canada Steel Ltd., Vancouver.
J. W. INGLIS, P.ENG., Principal, British Columbia Vocational School, Burnaby.
P. S. JAGGER, P.ENG., President, Asbestos Cement Products Ltd., North Surrey.
F. R. KILLAM, P.ENG., President, Industrial Coatings Ltd., Vancouver.
J. MCHUTCHISON, Plant Engineer, Canadian Western Pipe Mills Ltd., Port Moody.
W. E. MILLS, P.ENG., Department of Public Works, Victoria.
W. F. PAGE, Machine Shop Foreman, Burrard Drydock Co. Ltd., North Vancouver.
N. PURSELL, P.ENG., International Power & Engineering Consultants, Vancouver.
E. S. RHODES, P.ENG., Project Manager, H. A. Simons International Ltd., Vancouver.
W. O. RICHMOND, P.ENG., Professor of Mechanical Engineering, University of British Columbia, Vancouver.
L. F. WRIGHT, P.ENG., Vice-President, Wright Engineers Ltd., Vancouver.

MEDICAL LABORATORY ADVISORY COMMITTEE

Chairman:

RALPH W. SPITZER, M.D., Director of Biochemistry Laboratories, Royal Columbian Hospital, New Westminster.

Secretary:

MISS MARGARET ERSKINE, Technical Supervisor, Clinical Laboratory Services, Department of Health and Hospital Insurance, Vancouver.

Ex Officio:

STANLEY T. RICHARDS, Head, Department of Medical Technologies, British Columbia Institute of Technology, Burnaby.

Members:

ERNEST J. BOWMER, M.D., Director, Division of Laboratories, Health Branch, Department of Health Services and Hospital Insurance, Vancouver.

CHARLES F. A. CULLING, Instructor, Department of Pathology, Faculty of Medicine, University of British Columbia, Vancouver.

MICHAEL A. M. FRASER, Assistant Administrator, Royal Jubilee Hospital, Victoria.

GEORGE R. GRAY, M.D., Assistant Hæmatologist, Department of Pathology, Vancouver General Hospital, Vancouver.

GLENN M. MARTIN, M.D., Director of Laboratories, Royal Inland Hospital, Kamloops.

W. EARL SHEPHERD, M.D., Department of Pathology, Faculty of Medicine, University of British Columbia, Vancouver.

MEDICAL RADIOGRAPHY ADVISORY COMMITTEE

Chairman:

A. TURNBULL, M.D., Drs. Turnbull, Dickey, Sloan, Norton & Greig, Vancouver.

Secretary:

S. T. RICHARDS, Head, Department of Medical Technologies, British Columbia Institute of Technology, Burnaby.

Members:

M. A. M. FRASER, Assistant Administrator, Royal Jubilee Hospital, Victoria.

J. G. LOGAN, Chief Technician, Lions Gate Hospital, North Vancouver.

S. M. SMITH, Technical Adviser, Radiology, Department of Health Services and Hospital Insurance, Vancouver.

J. D. STEVENSON, M.D., Drs. Thorleifson & Stevenson, Vancouver.

MERCHANDISING AND SALES ADVISORY COMMITTEE

Chairman:

G. CHAPMAN, Merchandising Manager, Lauries Ltd., Vancouver.

Ex Officio:

J. C. MCADAM, P.ENG., Head, Business Management Technology, British Columbia Institute of Technology, Burnaby.

Members:

E. H. ANDREWS, Director of Marketing, Nabob Foods Ltd., Burnaby.

A. M. BELL, A. M. Bell and Associates, Vancouver.

E. BJARNASON, Vice-President, Retail Division, Cunningham Drug Stores Ltd., Vancouver.

P. CULOS, President, representing American Marketing Association (British Columbia Chapter), Vancouver, and Nabob Foods Ltd., 3131 Lake City Way, Burnaby.

W. A. FARR, Merchandise Superintendent, Mail Order, Simpsons-Sears Ltd., Burnaby.
V. J. HOUSEZ, Merchandise and Personnel Manager, Pacific Division, T. Eaton Company of Canada, Vancouver.
B. MOORE, Division Merchandise Manager, Woodward Stores Ltd., Vancouver.
R. L. PETERS, Assistant Store Manager, Hudson's Bay Company, Vancouver.

MINING TECHNOLOGY ADVISORY COMMITTEE

Chairman:

LESLIE G. R. CROUCH, P.ENG., Professor of Mining Engineering, University of British Columbia, Vancouver.

Ex Officio:

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

Members:

WILLIAM S. ADAMS, P.ENG., Vice-Principal, British Columbia Institute of Technology, Burnaby.
R. KENNETH G. DAVIES, P.ENG., Senior Mine Engineer, Sullivan Mines, Consolidated Mining and Smelting Company of Canada Limited, Kimberley.
THOMAS ELLIOTT, Manager, British Columbia and Yukon Chamber of Mines, Vancouver.
HARRY B. GILLELAND, Manager, Silver Standard Mines Ltd., Vancouver.
ROLAND E. LEGG, P.ENG., Consultant, Mining Engineers, Vancouver.
JOHN E. MCMYNN, P.ENG., Principal, N. D. Lea and Associates, Vancouver.
CHARLES H. MITCHELL, Secretary-Treasurer, The Mining Association of British Columbia, Vancouver.
JOHN W. PECK, P.ENG., Chief Inspector of Mines, British Columbia Government, Victoria.
LAWRENCE T. POSTLE, P.ENG., President, The Granby Mining Co. Ltd., Vancouver.
CHRISTOPHER RILEY, Consulting Mining Geologist, Vancouver.
E. CECIL ROPER, P.ENG., Principal, British Columbia Institute of Technology, Burnaby.
HARTLEY T. E. SARGENT, P.ENG., Chief, Mineralogical Branch, British Columbia Department of Mines and Petroleum Resources, Victoria.
JAMES T. WARD, Vancouver Office Manager, Cassiar Asbestos Corporation Ltd., North Vancouver.

SURVEYING ADVISORY COMMITTEE

Chairman:

D. J. ROY, P.ENG., 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, P.ENG., Associate Professor, University of British Columbia, Vancouver.
A. T. HOLMES, P.ENG., Partner, Underhill & Underhill, Surveyors and Civil Engineers, Vancouver.
W. N. PAPOVE, Partner, McElhanney Associates, Land Surveyors, Vancouver.

Calendar

1965

JULY

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AUGUST

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SEPTEMBER

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OCTOBER

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1966

JANUARY

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FEBRUARY

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MAY

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JUNE

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Calendar of Events, Academic Year 1965-66

1965

July 1 - - - - Commencement of academic year.

August 13 - - - Closing date of applications for admission.

September 7 and 8 - Registration of students.

September 9 - - - First term—classes begin.

October 11 - - - Thanksgiving Day holiday.

November 11 - - Remembrance Day holiday.

December 18 - - Christmas vacation commences.

1966

January 3 - - - Second term—classes begin.

March 14 to 18 - - Spring vacation.

April 8 - - - - Good Friday holiday.

April 11 - - - Easter Monday holiday.

May 23 - - - - Victoria Day holiday.

June 4 - - - - Summer vacation commences.

June 17 - - - - Convocation.

June 30 - - - - Conclusion of academic year.

• *For Calendars of Events for Medical Programmes see next two pages.*

Medical Laboratory Technology
Calendar of Events, 1965-66

A. At Associated Training School:

The registration dates at associated training schools vary. The schools will require the enrolling student to report a few days before proceeding to the Institute.

B. At British Columbia Institute of Technology:

September 7, 1965 - -	Class commences.
October 11 - - -	Thanksgiving Day holiday.
November 11 - - -	Remembrance Day holiday.
December 18 - - -	Christmas vacation commences.
January 3, 1966 - -	Class recommences.
March 14 to 18 - -	Spring vacation.
April 8 - - - -	Good Friday holiday.
April 11 - - - -	Easter Monday holiday.
May 23 - - - -	Victoria Day holiday.
June 3 - - - -	Class concludes.

C. At Associated Training School:

June 6, 1966, to June 30, 1967—completion of 22-month training period. Holidays and time-off prescribed by the individual training schools.

Medical Radiography Technology
Calendar of Events, 1965-66

FALL CLASS, 1965

A. AT ASSOCIATED TRAINING SCHOOL:

The registration dates at associated training schools vary. A period of orientation training of about two months' duration in the majority of the schools precedes training at the Institute.

B. AT BRITISH COLUMBIA INSTITUTE OF TECHNOLOGY:

September 7, 1965	Fall class commences.
October 11	Thanksgiving Day holiday.
November 11	Remembrance Day holiday.
December 18	Christmas holiday commences.
January 3, 1966	Class recommences.
January 28	Fall class concludes.

C. AT ASSOCIATED TRAINING SCHOOL:

January 31, 1966 — commence hospital training period. Holidays and time off prescribed by the individual training school.

D. AT BRITISH COLUMBIA INSTITUTE OF TECHNOLOGY:

A four-week period of tutorial training will be offered at a convenient date immediately prior to the writing of the certification examination of the Canadian Society of Radiological Technicians.

SPRING CLASS, 1966

A. AT ASSOCIATED TRAINING SCHOOL:

The registration dates at associated training schools vary. A period of orientation training of about two months' duration in the majority of the schools precedes training at the Institute.

B. AT BRITISH COLUMBIA INSTITUTE OF TECHNOLOGY:

January 31, 1966	Spring class commences.
March 14 to 18	Spring vacation.
April 8	Good Friday holiday.
April 11	Easter Monday holiday.
May 23	Victoria Day holiday.
June 17	Spring class concludes.

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 engineering 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 University Programme, or the equivalent. This automatically includes English 40 and two years of a foreign language.

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

For the Medical Laboratory and Medical Radiography Technologies, the student is referred to the Medical section of the Calendar pages 44 to 47.

As mathematics is an essential tool of the technician and is in constant use during the Institute programme, all students will be required to have attained pass standing in Mathematics 91.

In most technologies, draughting is a means of communication of only slightly less importance than the English language. The Industrial Arts courses taught in the British Columbia secondary schools include training in draughting. Therefore, one of the Industrial Arts series at the 90 level is a desirable subject for all candidates seeking entrance to most programmes at the Institute.

The Business Technologies require one of the following as a special prerequisite: History 91, Geography 91, Economics 92, Law 93, English 91.

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 Industrial Arts, Chemistry, Home Economics, or Biology will not necessarily preclude admission to an Institute programme.

Students who are entering Grades X and XI in the British Columbia secondary-school system in the fall of 1965 are referred to page 52 for tentative prerequisites for entrance to a particular programme. General prerequisite: Students seeking admission must have fulfilled the requirements for graduation from senior secondary school on the Academic and Technical Programme prescribed by the Department of Education for the Province of British Columbia.

2. Applicants educated outside British Columbia should submit their qualifications to the Registrar of the Institute.

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 one or more years of study at a level equal to or higher than that of a British Columbia Institute of Technology course will be permitted to enter at the level of the course for which the application has been made if the work previously covered is similar in content to the work of the Institute's courses, and if, in the opinion of the Board of Admissions, the applicant's record justifies giving him 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 of the Institute.

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

(i) An official transcript of all secondary (British Columbia) or high school or 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) A registration fee of five dollars ($5), payable by 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. Registration dates are September 7 and 8, 1965. 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

The staff of the Institute is available for interviews with parents and prospective students in order to discuss the Institute's programmes, and to offer advice and help.

D. Aptitude Tests

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

II. FEES

A. Annual Fees

Total fees for the academic year 1965–66 are:

1. Application and registration	$5.00
2. Tuition—	
First term	60.00
Second term	90.00
3. Students' Activity—	
First year	10.00
Second year	13.50
4. Caution Account	10.00

All cheques and money orders should be made payable to the B.C. Institute of Technology. All fees are payable within seven days after the commencement of each term. Students who have not paid their fees by the required date will not be admitted to classes and will not be considered to be registered at the Institute.

B. Withdrawal

Students who voluntarily withdraw from a programme, either for compassionate or other reasons, may receive a refund of their fees at the discretion of the Principal. Students must withdraw officially through the Registrar's Office. Compassionate reasons for withdrawal may be considered in terms of sickness, accident, or fatality, as it directly affects the welfare of the student.

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.

C. Additional Expenditures

1. *Textbooks, Instruments, and Supplies.*—Students should purchase as soon after registration as possible. The cost varies according to the programme from approximately $60 to $125. Students may purchase many of the above supplies from the Institute bookstore. Students are advised not to purchase any textbooks or instruments until they have met with their instructors.

2. *Medical Insurance.*—Students may obtain medical insurance coverage by an arrangement with the British Columbia Medical Services Incorporated (MSI), a non-profit organization sponsored and underwritten by the doctors of British Columbia. The plan provides the following benefits:

(i) The services of a personal physician for necessary medical and surgical care at home, in the doctor's office, or in hospital. The services of a specialist when referred by the attending doctor.

(ii) Standardized laboratory services and diagnostic aids, including X-rays when ordered by the attending doctor.

(iii) Surgical care, including anæsthesia.

(iv) Such emergency medical and surgical care outside of the Province of British Columbia anywhere in the world, when rendered by a physician and surgeon or doctor of medicine (M.D.) duly qualified and licensed to practise, as becomes necessary while the subscriber or registered dependent is travelling or on vacation outside the said Province.

A special rate for students covers the period September 1, 1965, to August 31, 1966. Students will be able to transfer from their parents' medical coverage on reaching their 21st birthday. Payments are to be made to the Bursar. A pamphlet outlining the details of the contract is available upon request.

III. FINANCIAL ASSISTANCE FOR STUDENTS

Government scholarships and other financial assistance are available to students attending the British Columbia Institute of Technology.

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 48 to 51 contain the details of the contributions to March 1, 1965. Inquiries concerning financial aid should be directed to the office of the Registrar.

IV. PLACEMENT SERVICE

The Institute assists students to obtain placement both during the summer vacation and after graduation. The service is under the direction of the Placement Officer. He arranges interviews with prospective employers, and opportunities for employment are brought to the attention of students and graduates looking for positions.

To meet the increasing need of an effective placement service for all students, the Vancouver office of the National Employment Service has established a branch employment office at the Institute.

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. A list of accommodations may be obtained from the Registrar's Office. Board and room will cost approximately $70 to $90 a month. An excellent cafeteria provides economical services for students.

VI. ACADEMIC AWARDS

A. Diplomas (Dipl.T.)

The students who graduate from the British Columbia Institute of Technology will be awarded a nationally recognized Diploma of Technology. Honour diplomas will be awarded to those who obtain at least an average standing of 80 per cent in each year of the course with not less than 70 per cent in any subject. Duplicate diplomas will be issued only on a payment of a fee of $3.

B. The British Columbia Institute of Technology Honour Awards

One gold and two silver rings will be awarded to students in their graduating year who, in the opinion of the Selection Committee, combine to the greatest extent academic and technical ability, social and athletic interest, good character and personality.

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

B. Final Examinations

Final examinations are conducted in December and June of each academic year. Students are personally responsible for presenting themselves at examinations on the scheduled day and hour. If a student is unable to produce a reason satisfactory to the Registrar for defaulting an examination, he is considered to have failed in that subject.

Unless a student has paid all fees and dues for which he is liable, has returned all borrowed Institute property, and attained requisite academic standing, he will not be allowed to write the final examinations. Students actually under medical treatment in the period immediately prior to the examinations are reminded that it is their responsibility to notify the Registrar that this situation exists, if it is likely to affect their attendance at examinations.

C. Determination of Standing

Final standing is determined on the basis of term work and the results of final examinations. A minimum of 50 per cent in each subject is required for a credit standing. Examination 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 "aeg" (aegrotat) 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. "Aegrotat" 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.

D. Failure and Repetition

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

E. 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, a passing grade is obtained in place of a failure.

F. Transcripts

A fee of $2 is charged for each transcript of an undergraduate's or graduate's marks.

G. Evening Division

For details of the evening division courses *see* separate evening division calendar.

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 Principal possesses the final authority to approve, amend, and/or revise the constitutions of all student

organizations connected with the Institute. If the Principal believes it is in the interest of the Institute to do so, he has full authority to suspend the constitution of any student organization, to penalize the members of that organization, or to deal with any situation that arises in any manner he deems fit.

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

(*d*) No student group is permitted to participate in a parade in a public thoroughfare without the prior consent of the Principal.

(*e*) 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.

(*f*) 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.

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

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

(*i*) 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, which will be supplied by the Institute, is worn in place of the coats or blazers mentioned in item (ii).

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

(*j*) 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 the Registrar 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. (The Institute will provide all locks.) 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, students' personal property.

XII. LIBRARY

The Library, located on the second floor, contains 5,000 carefully selected volumes in all fields of the curriculum and in related sciences. Over 300 periodicals are currently received. The Library is "open stack," with free access to all holdings except for books in the reserve collection.

A handbook describing the facilities available and the regulations governing the use of the Library is given to each student during fall orientation.

XIII. AUDIO-VISUAL BRANCH

The Audio-Visual Branch provides motion-picture films, other instructional materials, and equipment through its three main divisions—Utilization, Production, and Engineering. It builds the Institute's own growing film library and arranges for rental, preview, and purchase of other films from major sources throughout the world. It provides faculty with reference services for film and other

instructional materials and provides consultant and evaluative services on audio-visual applications. It supervises production of motion pictures and other teaching aids for the Institute's specialized use. It co-ordinates the planning and modification of audio-visual installations.

MEDICAL LABORATORY TECHNOLOGY

I. ENROLMENT

A. Conditions of Admission

1. The educational prerequisites for applicants with British Columbia educational standing are Senior Matriculation (Grade XIII) or First Year University level in:

English (literature and composition).
Mathematics (any two of algebra, trigonometry, or geometry).
Chemistry (general chemistry).
One other science—bacteriology, biology, zoology, or physics.
One other subject, preferably a second language.

2. Applicants with other than British Columbia educational standing should submit a transcript of marks for evaluation to The Registrar, Canadian Society of Laboratory Technologists, 99 Wentworth Street South, Hamilton, Ont. The transcript, together with a report of this evaluation, must be submitted to the selected associated training school.

3. Candidates must be 17 years of age at day of registration. There is no upper age limit.

B. Procedure for Admission

1. Special application forms may be obtained from an associated training school or the Institute. Students are selected and enrolled by the individual training schools, the Institute acting as a clearing centre for all applications. Applicants are advised to list on the application forms their first, second, or further choice of the associated training school in which enrolment is sought.

2. Application forms MUST be completed in DUPLICATE. Each copy MUST be accompanied by:

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

(*b*) A statement from the principal of the senior secondary school or head of the faculty stating that the applicant is expecting to obtain necessary credits and grades for admittance. THIS STATEMENT MUST BE SUBSTANTIATED BY AN OFFICIAL TRANSCRIPT WHEN IT BECOMES AVAILABLE.

3. Completed applications should be forwarded to the Registrar of the Institute, to arrive not later than July 1, 1965.

4. Prior to final acceptance a report of medical fitness and an immunization record will be required. Applicants will be informed of action to be taken.

II. FEES

1. Course fee is $200, payable as follows: $110 upon enrolment at the associated training school and $90 in January, 1966, at the Institute.

2. A trainee membership fee of $10 must be paid to the Canadian Society of Laboratory Technologists, on registration at the associated training school.

3. Toward the end of the training course an examination fee of $50 will be payable to the Canadian Society of Laboratory Technologists.

4. *Refunds.*—(*a*) Students who voluntarily withdraw from the programme, either for compassionate or other reasons, may receive a refund of the course fee at the discretion of the Principal and the administration of the associated training school.

(*b*) Students who are requested to withdraw for reasons of discipline or unsatisfactory progress may forfeit any right to refund.

III. ADDITIONAL EXPENDITURES

1. Approximately $10 for textbooks and stationery.
2. Regular student activity and caution fees will be charged.

IV. ADDITIONAL INFORMATION

A. Examinations

1. Practical and written examinations will be held at the end of tuition in each subject as stated in the course outline. Students who fail in one of these subjects may be permitted to write the next examination in this subject. Students who fail in a second subject will be required to withdraw from the course. Final standing at the Institute is determined on the basis of term work and the results of examinations.

2. Qualifying examinations of the Canadian Society of Laboratory Technologists will be conducted at the Institute.

B. Progress and Conduct

Students whose progress is unsatisfactory will be reported to their associated training school. The Institute reserves the right to suspend students for infraction of regulations, as published, governing conduct, discipline, and attendance.

MEDICAL RADIOGRAPHY TECHNOLOGY

I. ENROLMENT

A. Conditions of Admission

1. Applicants must have at least Junior Matriculation (University Programme). Credits in physics and chemistry are desirable. Preference will be given to candidates with higher educational standing.

2. Students must be 17 years of age at day of registration and of good physical and mental health.

3. Male and female students will be accepted for training.

B. Procedure for Admission

1. Special application forms may be obtained from an associated training school or the Institute. Students are selected and enrolled by the individual training schools, the Institute acting as a clearing centre for all applications. Applicants are advised to list on the application forms their first, second, or further choice of the training school in which enrolment is sought.

2. Application forms MUST be completed in DUPLICATE. Each copy MUST be accompanied by:

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

(*b*) A statement from the principal of the senior secondary school or head of the faculty stating that the applicant is expecting to obtain necessary credits and grades for admittance. THIS STATEMENT MUST BE SUBSTANTIATED BY AN OFFICIAL TRANSCRIPT WHEN IT BECOMES AVAILABLE.

3. Completed applications should be forwarded to the Registrar of the Institute, to arrive not later than May 1, 1965, for the Fall 1965 class, or September 1, 1965, for the Spring 1966 class.

4. Prior to final acceptance a report of medical fitness and an immunization record will be required. Applicants will be informed of action to be taken.

II. FEES

1. Course fee is $125, payable upon registration at the associated training school.

2. A student registration fee of $15 plus $2 for a student kit must be paid to the Canadian Society of Radiological Technicians (British Columbia Division) on registration at the associated training school. The annual membership fee for students is $4.

3. An examination fee of $20 is payable to the Canadian Society of Radiological Technicians prior to writing the certification examination. This examination is held the first Saturday in May and November each year.

4. *Refunds.*—(*a*) Students who voluntarily withdraw from the programme either for compassionate or other reasons may receive a refund of the course fee at the discretion of the Principal and the administration of the associated training school.

(*b*) Students who are requested to withdraw for reasons of discipline or unsatisfactory progress may forfeit any right to refund.

III. ADDITIONAL EXPENDITURES

1. Approximately $50 for textbooks.
2. Nominal student activity and caution fees will be charged.

IV. ADDITIONAL INFORMATION

A. Examinations

Practical and written examinations will be held at the end of tuition in each subject as stated in the course outline. Students who fail in one of these subjects may be permitted to write the next examination in this subject.

Final standing at the Institute is determined on the basis of the term work and the results of the examinations.

B. Progress and Conduct

Students whose progress is unsatisfactory will be reported to their associated training schools. The Institute reserves the right to suspend students for infraction of regulations, as published, governing conduct, discipline, and attendance.

British Columbia Institute of Technology
Scholarship and Bursary Fund

BRITISH COLUMBIA INSTITUTE OF TECHNOLOGY SCHOLARSHIP AND BURSARY FUND

CONTRIBUTIONS RECEIVED TO MARCH 1, 1965

W. H. BALL ($51)

The W. H. Ball donation has been placed in the British Columbia Institute of Technology Scholarship and Bursary Emergency Fund.

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 Instrumentation and Control Technology.

CONSOLIDATED MINING AND SMELTING COMPANY OF CANADA LIMITED ($400)

The Consolidated Mining and Smelting Company of Canada Limited will award one scholarship of $200 to a student in the Mining Technology and one scholarship of $200 to a student in the Chemical and Metallurgical Technology.

JOHN JOSEPH GAREY FUND ($215)

The John Joseph Garey Fund will award one scholarship of $115 and one scholarship of $100 to students in the Instrumentation Technology.

ELECTRO TEC MARKETERS, LTD. ($50)

Electro Tec Marketers, Ltd., will award $50 to a student in the Electrical and Electronics Technology.

FALCONBRIDGE NICKEL MINES LIMITED ($300)

The Falconbridge Nickel Mines Limited will award one scholarship of $150 to a student in the Surveying Technology and one scholarship of $150 to a student in the Mining Technology.

INDUSTRIAL COATINGS, LTD. ($300)

The Industrial Coatings, Ltd., will award two bursaries of $150 each to students in the Mechanical Technology.

INTERNATIONAL NICKEL SCHOLARSHIP IN ENGINEERING TECHNOLOGY ($250)

The Inco Scholarship Fund at the British Columbia Institute of Technology provides for the awarding of one or more scholarships annually. The awards, valued at a minimum of $100 to a maximum of $250, are known as The International Nickel Scholarships in Engineering Technology.

Any student with a good scholastic record and a good personal reputation, who has the necessary qualifications to enrol in a diploma course in Engineering Technology, is eligible to apply for an Inco scholarship.

Interested students should apply directly to the Registrar at the British Columbia Institute of Technology.

MERRILL GARDNER, LTD. ($50)

D. W. MITCHELL ($400)

The D. W. Mitchell donation has been placed in the British Columbia Institute of Technology Scholarship and Bursary Emergency Fund.

MACMILLAN, BLOEDEL AND POWELL RIVER LIMITED ($300)

MacMillan, Bloedel and Powell River Limited will award one bursary of $150 to a student in the Forestry Technology and one bursary of $150 to a student in the Forest Products Technology.

PACIFIC LOGGING COMPANY LIMITED ($150)

Pacific Logging Company Limited will award one scholarship of $150 to a British Columbia Institute of Technology student.

PLACER DEVELOPMENT, LIMITED ($1,400)

Placer Development, Limited, will award four $350 scholarships to students in the Chemical and Metallurgical, Mining, and Surveying Technologies.

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

Rayonier Canada (B.C.) Limited will award three $350 scholarships to students within the Forestry Technologies.

SANDWELL AND COMPANY LIMITED ($250)

Sandwell and Company Limited will award one $150 scholarship and one $100 scholarship to students at the British Columbia Institute of Technology.

H. A. SIMONS (INTERNATIONAL) LTD. ($1,000)

H. A. Simons (International) Ltd. will award five $200 scholarships or bursaries to students at the British Columbia Institute of Technology.

TAHSIS COMPANY, LTD. ($500)

Tahsis Company Ltd. will award one scholarship of $200 to a student in the Forestry Technology, one scholarship of $150 to a

student in the Forest Products Technology, and one scholarship of $150 to a student in one of the other technologies.

UNITED KENO HILL MINES LIMITED ($200)

United Keno Hill Mines Limited will award one bursary of $200 to a student in the Mining Technology.

Inquiries concerning scholarships and bursaries should be directed to the Registrar's Office.

Advance Prerequisites (Effective September, 1967)

GENERAL PREREQUISITE

Students seeking admission must have fulfilled the requirements for graduation from senior secondary school on the Academic and Technical Programme prescribed by the Department of Education for the Province of British Columbia.

SPECIAL PREREQUISITES BY TECHNOLOGY

		Building	Chemical and Metallurgical	Civil and Structural	Electrical and Electronics (Plus Broadcast Tech.)	Food Processing	Forest Products	Forestry
Mandatory	A. & T. Prog.	Ma 12 Phys 12	Ma 12 Phys 12 Chem 12	Ma 12 Phys 12 Chem 11	Ma 12 Phys 12 Chem 11	Ma 12 Phys 12 Chem 12	Ma 12 Phys 12 Chem 12	Ma 12 Bi 11
	Other Progs.	Dra 11	Dra 11	Dra 11	Dra 11		Dra 11	Dra 11
Desirable*	A. & T. Prog.	Chem 11			Ec 11	Bi 11		Phys 11
	Other Progs.	Dra 12 Const 11 Const 12A Const 12B	Mech 11	Dra 12 Const 11 Const 12A Const 12B Mech 11	Mech 11 Elect 11 Ind Power 11		Ind Power 11 Gen Bus 11 Gen Bus 12	Ind Power 11 Gen Bus 11 Gen Bus 12

		Gas and Oil	Instrumentation	Mechanical	Mining	Surveying	Broadcast Communications	Business	Hotel, Motel Management
Mandatory	A. & T. Prog.	Ma 12 Phys 12 Chem 12	Ma 12 Phys 12 Chem 12	Ma 12 Phys 12	Ma 12 Phys 12 Chem 12	Ma 12 Phys 12	Hist 12 Eng Lit 12	Ma 12	Ma 12
	Other Progs.	Dra 11	Dra 11	Dra 11 Mech 11	Dra 11	Dra 11			
Desirable*	A. & T. Prog.						Ec 11	Fr 11 Eng Lit 12 Ec 11	Fr 11 Eng Lit 12 Ec 11
	Other Progs.		Mech 11	Elect 11 Dra 12			Typ 11 Any Theatre Specialty Courses	Any Accountancy Specialty Courses	Foods 11 Foods 12A Any Accountancy Specialty Courses

• Desirable subjects are not to be construed as mandatory for selection purposes; however, they would be an aid as background material for programmes concerned.

List of Programmes

BROADCAST COMMUNICATIONS

BUILDING TECHNOLOGY

BUSINESS MANAGEMENT

CHEMICAL AND METALLURGICAL TECHNOLOGY

CIVIL AND STRUCTURAL TECHNOLOGY

ELECTRICAL AND ELECTRONICS TECHNOLOGY

FOOD PROCESSING TECHNOLOGY

FOREST PRODUCTS TECHNOLOGY

FORESTRY TECHNOLOGY

GAS AND OIL TECHNOLOGY

HOTEL, MOTEL AND RESTAURANT MANAGEMENT

INSTRUMENTATION AND CONTROL TECHNOLOGY

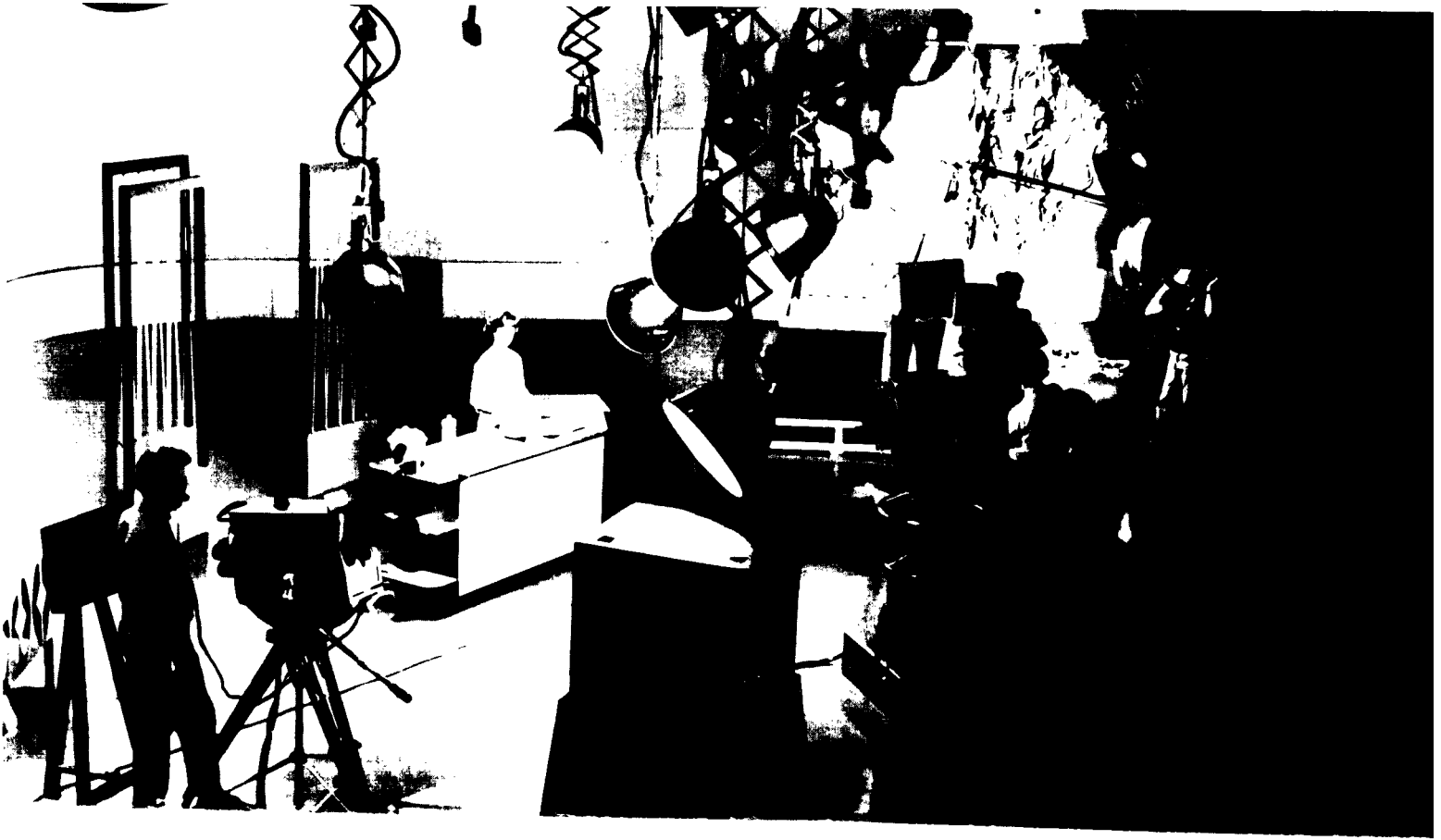
MECHANICAL TECHNOLOGY

MEDICAL LABORATORY TECHNOLOGY

MEDICAL RADIOGRAPHY TECHNOLOGY

MINING TECHNOLOGY

SURVEYING TECHNOLOGY



Broadcast Communications

The need for educational facilities in broadcast communications has long been recognized by the industry in Canada. This is particularly true in Western Canada, for the programme in the British Columbia Institute of Technology is the first to be offered in this area and only one other programme exists in Canada.

The broadcasters of this Province lend their whole-hearted support to this programme; 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, the demand for trained personnel continues to rise. To give training with a strong emphasis on the practical aspects, a complete radio and television station was established in 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 months before they go into industry.

The programme offers two distinct two-year options—Production and Technical. Each includes both radio and television.

Students in the Production Option receive training in all non-technical areas of broadcasting. In addition to tuition 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.

On the other hand, Technical Option students are given a complete electronics programme, coupled with extensive practical training in the maintenance and repair of all radio and television broadcasting equipment in both studio and transmitter operations. During the second year, students gain on-the-job training by devoting more than 40 per cent of their time to working together in radio and television production.

Graduates in the Production Option can expect to be employed as announcers, writers, operators, news editors and reporters, and in other production jobs in radio or television. Those from the Technical Option will find employment as transmitter or studio maintenance technicians and in other areas of both radio and television operations.

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 sound knowledge of English is essential for the Production Option; competence in mathematics and physics is required for the Technical Option.

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

BROADCAST COMMUNICATIONS

PRODUCTION OPTION

YEAR 1 — *Term 1*

No.	Subject	Hours per Week Lec.	Lab.
31.101	Writing and Contemporary Thought	2	1
32.104	Statistics	2	3
90.135	Economics	2	2
91.108	Law and Government Regulations	2	---
91.105	Contemporary History	2	---
91.111	Music for Broadcasting	1	1
91.103	Writing for Radio	1	2
91.113	Typing	---	3
91.101	Elementary Broadcast Technology (Radio)	2	1
91.110	Workshop	---	8
		14	21

Term 2

31.201	Writing and Contemporary Thought	2	1
90.235	Economics	2	2
91.208	Law and Government Regulations	2	---
91.205	Contemporary History	3	---
91.211	Music for Broadcasting	1	1
91.203	Writing for Radio	1	2
91.204	Speech for Broadcasting	2	2
91.201	Elementary Broadcast Technology (Television)	2	1
91.210	Workshop	---	8
	Tutorials	---	3
		15	20

YEAR 2 — *Term 3*

31.301	Writing and Contemporary Thought	2	1
91.305	Contemporary History	2	1
91.309	News for Broadcasting	2	2
91.304	Speech for Broadcasting	1	2
91.303	Writing for Television	1	2
91.302	Production—Radio	2	4
91.312	Production—Television	2	6
	Tutorial	---	3
	Seminar	---	2
		12	23

Term 4

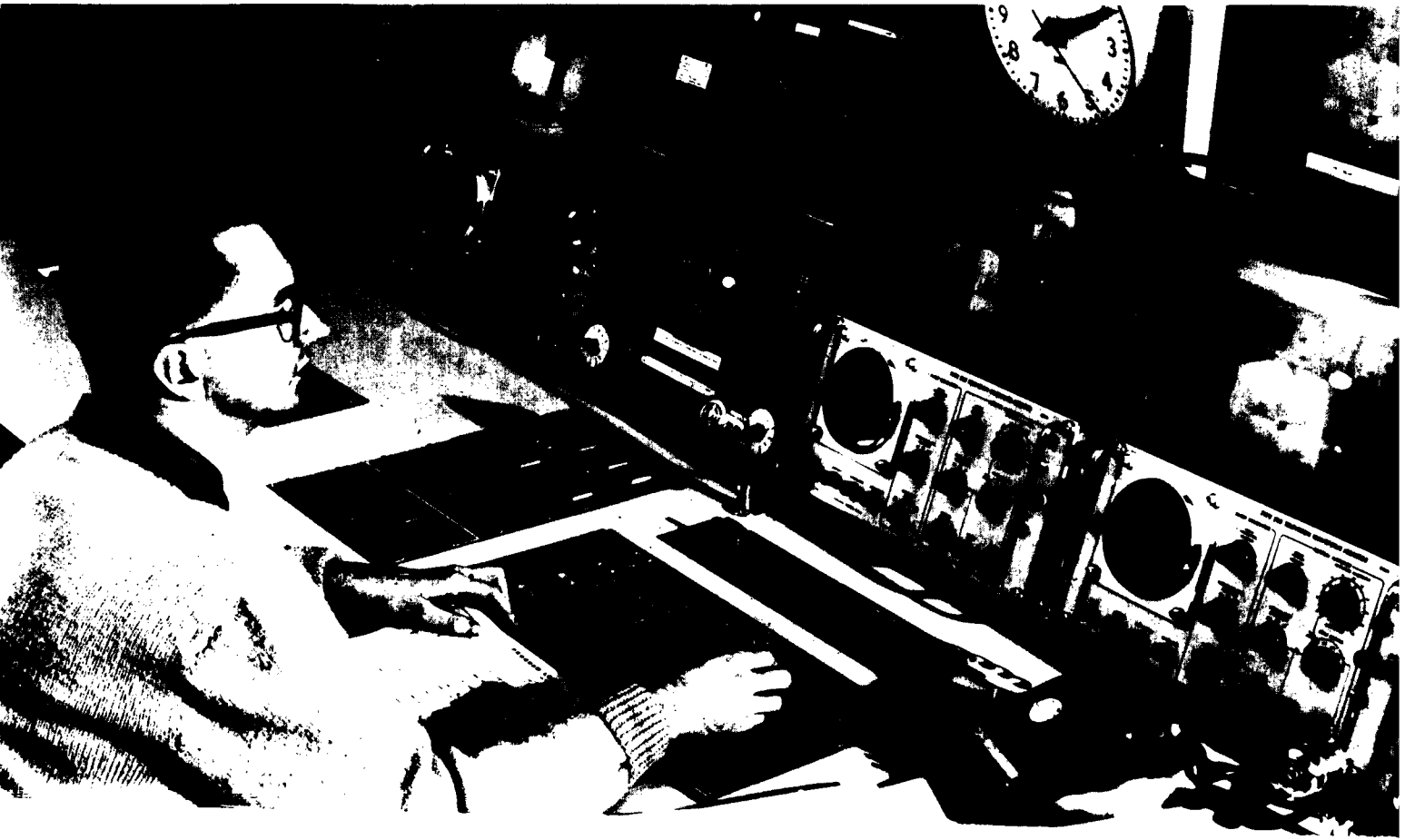
31.401	Writing and Contemporary Thought	2	1
91.405	Contemporary History	2	1
91.403	Writing for Television	1	2
91.409	News for Broadcasting	2	2
91.404	Speech for Broadcasting	1	2
91.402	Production—Radio	2	4
91.412	Production—Television	2	6
	Tutorial	---	3
	Seminar	---	2
		12	23

General Prerequisite: Graduation on the University Entrance Programme.

Special Prerequisite: One of the following—History 91, Geography 91, Economics 92, Law 93, English 91.

Subjects Desirable but Not Essential (*see* General Requirements under Enrolment): Major in Mathematics; Physics.

NOTE.—*See* page 52 for prerequisites effective September, 1967.



BROADCAST COMMUNICATIONS
TECHNICAL OPTION

No.	Subject	Hours per Week Lec.	Lab.
	YEAR 1 *Term 1*		
31.101	Writing and Contemporary Thought	2	1
32.102	Mathematics	5	4
33.101	Physics	3	3
49.101	Draughting	---	3
43.101	Semi-conductors and Tubes	2	3
91.101	Elementary Broadcast Technology (Radio)	2	3
49.166	Shop Practice	---	2
	Tutorials	---	2
		14	21
	Term 2		
31.201	Writing and Contemporary Thought	2	1
32.202	Mathematics	5	4
33.201	Physics	3	3
43.202	Circuits, Electrical and Electronic	3	6
91.201	Elementary Broadcast Technology (Television)	2	3
	Tutorials	---	3
		15	20
	YEAR 2 *Term 3*		
31.301	Writing and Contemporary Thought	1	1
32.302	Mathematics	3	2
43.303	Measurements, Electrical and Electronic	1	3
43.323	Electronic Circuits	3	3
43.324	Radio Circuits	2	3
91.315	Workshop—Television and Radio	3	10
		13	22
	Term 4		
90.230	Business	1	1
43.425	Pulse Circuits	3	3
43.427	Microwave Systems	1	2
91.414	Radio and Television Transmission	1	2
43.426	Radar	1	2
43.428	Digital Techniques	1	2
91.415	Workshop—Television and Radio	4	11
		12	23

General Prerequisite: Graduation on the University Entrance Programme.

Special Prerequisites: Mathematics 91; Physics 91.

Subjects Desirable but Not Essential (*see* General Requirements under Enrolment): Chemistry; Industrial Arts, 90 Series.

NOTE.—*See* page 52 for prerequisites effective September, 1967.

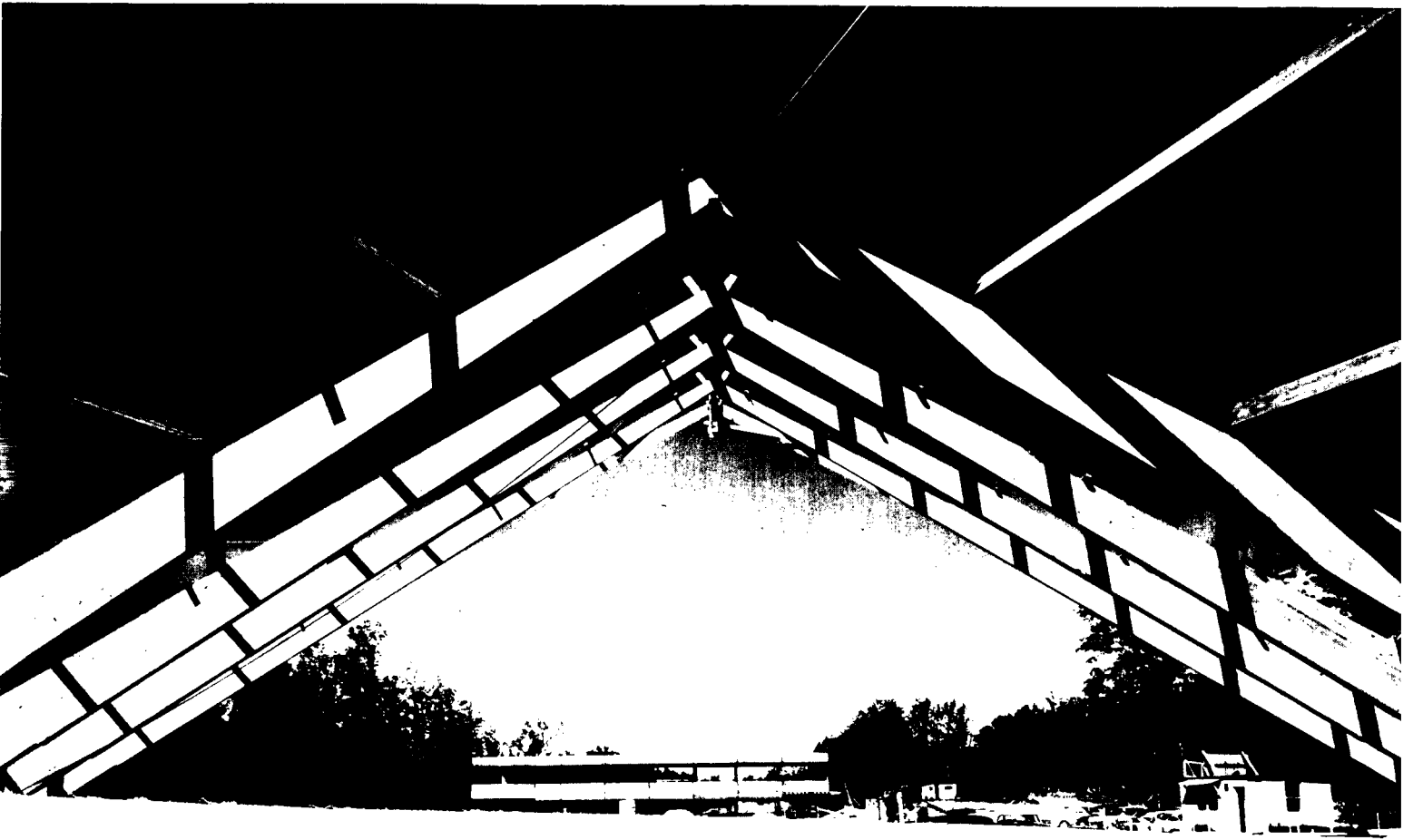
TABLE 3

Building Technology

The requirements of Canada's fast-expanding population demand that an equal number of new buildings must be produced in the next 30 years as have been built to date. In addition, demands on the construction industry are compounded by technological developments in the materials, structural form, air-conditioning requirements, and communication services of a modern building. As a result, an urgent need exists for highly trained technicians whose basic knowledge in mathematics and the sciences equips them to deal with a rapidly changing technology.

The Building Technology programme, designed to meet this need, emphasizes a practical knowledge of the materials and methods of building construction as well as the detailing of buildings, their components and services. A major proportion of the time also is devoted to developing a good general knowledge of planning and design of buildings, their structure and mechanical services. The well-equipped laboratories of the Institute plus field trips to actual building sites and plants provide an essential link with practice in the industry. Typical employment opportunities for the graduate will be in architectural and engineering offices, construction firms, government agencies, real-estate development companies, and building-products firms where he will be performing such duties as draughting, contracting, supervising, inspecting, estimating, and selling. He will be qualified to work directly with architects and engineers on the one hand and construction personnel on the other, with opportunities to be in an office or outdoors.

To be successful in this programme, the student should possess above average ability in mathematics and physics and a definite interest in æsthetics. At the same time, he must be eager to take a major part in the creation of our future environment and be prepared to meet the great challenge of this field.



BUILDING TECHNOLOGY

YEAR 1 — *Term 1*

No.	Subject	Hours per Week Lec.	Lab.
31.101	Writing and Contemporary Thought	2	1
32.101	Mathematics	3	2
33.101	Physics	3	3
40.101	Design and Draughting	1	4
40.102	Building Construction	2	4
40.103	Building Services	1	2
42.120	Building Structures	2	2
51.102	Surveying	----	3
		14	21

Term 2

31.201	Writing and Contemporary Thought	2	1
32.202	Mathematics	3	2
33.201	Physics	3	3
40.201	Design and Draughting	1	4
40.202	Building Construction	2	4
40.203	Building Services	2	1
42.220	Building Structures	2	2
51.202	Surveying	----	3
		14	21
40.204	Summer Project		

YEAR 2 — *Term 3*

31.301	Writing and Contemporary Thought	1	1
40.301	Design	1	3
40.302	Building Construction	2	5
40.303	Building Services	2	2
40.305	Estimating	2	1
40.306	Materials and Specifications	3	----
40.307	Building Regulations	1	----
42.320	Building Structures	1	4
90.190	Work Study	1	2
	Tutorials	----	3
		14	21

Term 4

31.401	Writing and Contemporary Thought	1	1
40.401	Design	1	3
40.402	Building Construction	2	5
40.403	Building Services	2	3
40.406	Materials and Specifications	2	1
40.408	Construction Management	2	2
42.420	Building Structures	1	4
90.230	Business	1	1
	Tutorials	----	3
		12	23

General Prerequisite: Graduation on the University Entrance Programme.

Special Prerequisites: Mathematics 91, Physics 91.

Subjects Desirable but Not Essential (*see* General Requirements under Enrolment): Industrial Arts, 90 Series; Chemistry.

NOTE.—*See* page 52 for prerequisites effective September, 1967.


IBM

Business Management

The accelerated pace of development of scientific knowledge and industrial productivity has increased tremendously the complexity of business, and has stimulated competition to a very intense level. In order to maintain its competitive ability, management has had to rely increasingly on a more scientific approach to managing. Modern scientific management relies on adequate, accurate, and timely facts, and sophisticated techniques of analysis in the decision-making process. Specialists in many fields are employed to gather, analyse, and present information for management's use, and with the increasing use of trained specialists in modern business, young persons about to enter business not only must be eager, intelligent, and hard working, but they must have specialized training as well. The curriculum of the Business Management programme embraces the increasingly technical nature of administrative and marketing practices, and graduates from this programme will find themselves eagerly sought after by prospective employers.

Students entering the Business Management programme are required to have secondary-school graduation on a University Entrance programme, or equivalent, with a major in mathematics. Students will follow a prescribed course in their first year, and with this exposure to business fundamentals will choose an area of specialization in their second year in either the Merchandising and Sales Option, or the Technical Management Option.

Merchandising and Sales Option

The revolution in marketing calls for new emphasis in training to fill the many exciting and satisfying job opportunities in buying, merchandising, retailing, industrial sales, advertising, and sales promotion. No other occupations present a greater challenge to the qualified man or woman, or provide greater or quicker rewards for accomplishment. There are particularly good opportunities for women Business Management graduates in all of these fields.

Technical Management Option

The Technical Management Option offers a wide range of courses to students choosing this option. Courses will be selected from among all second-year courses, including those in the Merchandising and Sales Option, in consultation with the Faculty, and subject to their approval. Students will be encouraged to take a core of courses, or major, in either Data Processing and Systems or Administrative Management, which will train them specifically for employment in these areas.

Data Processing and Systems

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

Administrative Management

The Administrative Management major will enable students to concentrate their studies in the growing and dynamic area of modern office services, or in a wider range of subjects in the extremely challenging field of small business. Job opportunities are abundant in both these fields, and students taking this major will have a sound base upon which to build for future progress.

BUSINESS MANAGEMENT

MERCHANDISING AND SALES OPTION

YEAR 1 *Term 1*

No.	Subject	Hours per Week Lec.	Lab.
31.102	Business Writing and Contemporary Thought	2	1
90.103	Business Mathematics	2	3
90.131	Introduction to Business	2	1
90.135	Economics	2	2
90.140	Accounting	2	3
90.150	Data Processing	1	3
90.170	Marketing	2	1
90.190	Work Study	1	2
	Tutorials	—	5
		14	21

Term 2

31.202	Business Writing and Contemporary Thought	2	1
90.204	Business Statistics	2	3
90.231	Introduction to Business	2	1
90.235	Economics	2	2
90.240	Accounting	2	3
90.250	Data Processing	1	3
90.270	Marketing	2	1
90.296	Systems and Procedures	1	2
	Tutorials	—	5
		14	21

YEAR 2 *Term 3*

90.322	Human Relations	2	1
90.333	Industrial Processes	1	2
90.342	Merchandising and Sales Accounting	2	3
90.360	Law and Government Regulations	2	1
90.371	Marketing Institutions	2	2
90.372	Merchandising	2	3
90.373	Advertising and Sales Promotion	2	3
90.375	Salesmanship	1	2
	Tutorials	—	4
		14	21

Term 4

90.424	Personnel Administration	2	1
90.443	Management Accounting	2	3
90.445	Credit and Collections	2	1
90.460	Law and Government Regulations	2	1
90.471	Marketing Institutions	2	2
90.472	Merchandising	2	3
90.473	Advertising and Sales Promotion	2	3
90.474	Market Research	2	2
	Tutorials	—	3
		16	19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BUSINESS MANAGEMENT

TECHNICAL MANAGEMENT OPTION

YEAR 1

Programme same as Merchandising and Sales Option on page 69.

YEAR 2 *Term 3*

No.	Subject	Hours per Week Lec.	Lab.
90.303	Mathematical Analysis	1	2
90.322	Human Relations	2	1
90.333	Industrial Processes	1	2
90.341	Cost Accounting	2	3
90.346	Auditing	2	1
90.350	Computer Programming	2	6
90.360	Law and Government Regulations	2	1
90.361	Finance	2	2
90.381	Communication Systems	1	2
90.382	Office Systems and Equipment	1	2
90.396	Data Processing Applications	2	3

Term 4

90.403	Mathematical Analysis	1	2
90.424	Personnel Administration	2	1
90.443	Management Accounting	2	3
90.445	Credit and Collections	2	1
90.446	Intermediate Accounting	2	3
90.450	Computer Programming	2	6
90.460	Law and Government Regulations	2	1
90.461	Finance	2	2
90.482	Office Systems and Equipment	1	2
90.491	Work Study	1	3
90.496	Advanced Computer Systems	2	4

Students in the Technical Management Option may major in Data Processing and Systems or in Administrative Management by taking prescribed and elective subjects which, together with tutorials, will total 35 hours. Electives may be chosen, subject to Faculty approval, from any second-year subject in the Business Management Programme.

General Prerequisite: Graduation on the University Entrance Programme.

Special Prerequisite: Mathematics 91.

Subjects Desirable but Not Essential: English 91, French 30, Commerce 91, Typing 30.

NOTE.—*See* page 52 for prerequisites effective September, 1967.

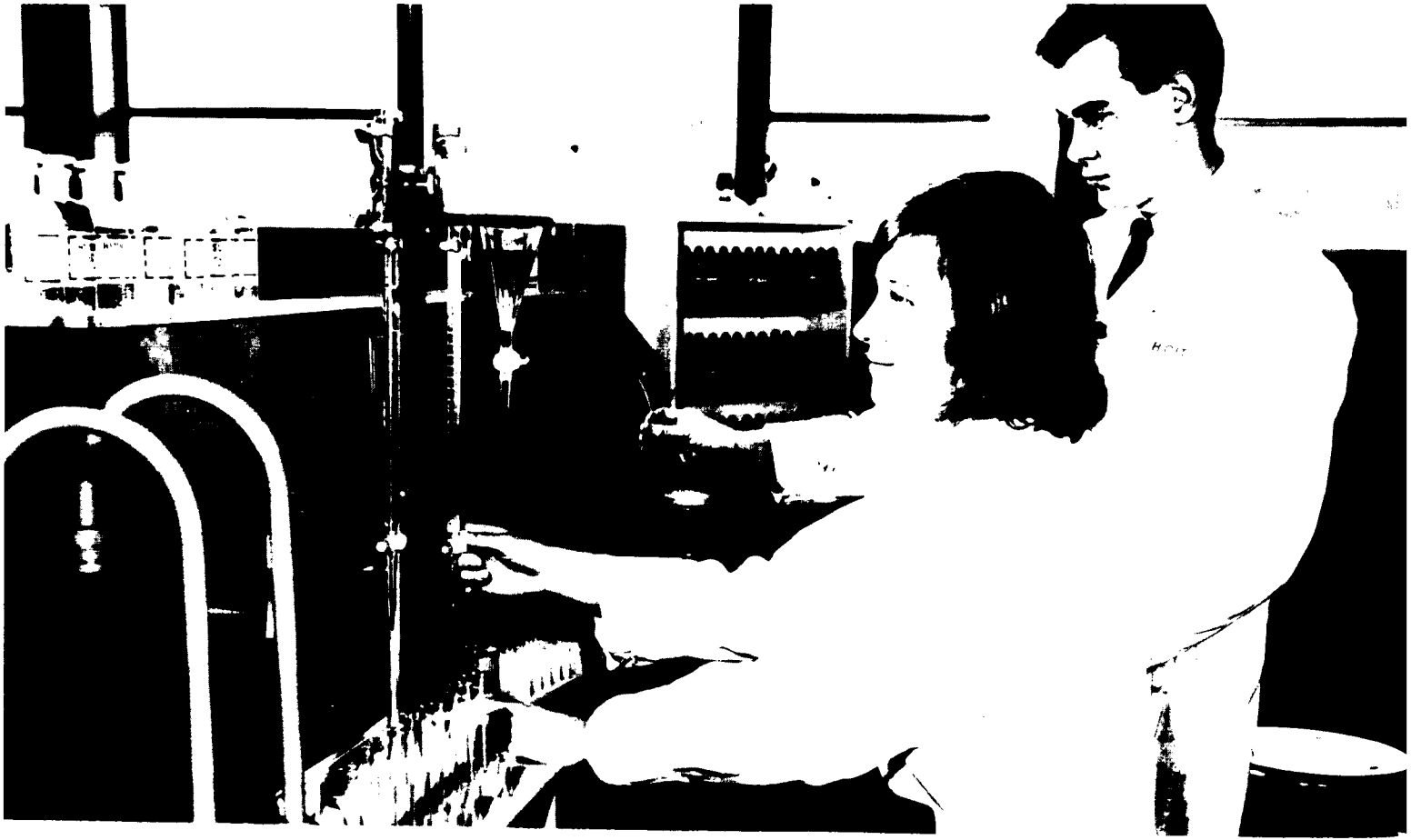
Chemical and Metallurgical Technology

The programme in Chemical and Metallurgical Technology provides instruction to those men and women wishing to enter the process industries, either as operating or laboratory personnel. 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 most raw-materials processing operations, rather than to specific problems peculiar to a single industry. Consequently, the first year is quite general, only the tutorials and a workshop course being at all unique to this programme.

In the second year the curriculum provides considerable analytical laboratory practice together with such production training as work study, unit operations, and instrumentation. In addition, the student is given the option of taking one subject in physical metallurgy or an advanced course in organic chemistry. In this way a graduate will be equipped to enter the industry of his choice in either the production or laboratory department, or even to move from one to the other.

Typical of the industries that will engage graduates from the programme are oil refiners, chlorine and caustic soda producers, beet and cane sugar refiners, cement producers, lime and gypsum producers, plastics and resin producers; iron, copper, lead, nickel, and other metal smelters; aluminum, magnesium, bronze, and iron and steel founders; 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 junior chemist or analyst in a commercial, food, or smelter laboratory; control sampler in a sugar-mill, caustic soda plant, pulp-mill, or mineral-concentrating plant; metallurgist's assistant in a steel-mill, a heat-treating shop, an electroplating plant, or an oil refinery; and supervisory trainee in practically any processing operation.

Salaries will vary according to the industry, company, and job. However, the salary will usually begin at about the level of a journeyman in the same field and then will rise to overlap that of the engineer or scientist working alongside the technician. In the large, highly organized companies there is often a ceiling on the technician's salary, but in the smaller companies his advance is limited only by his initiative and ability.



CHEMICAL AND METALLURGICAL TECHNOLOGY

YEAR 1 — *Term 1*

No.	Subject	Hours per Week Lec.	Lab.
31.101	Writing and Contemporary Thought	2	1
32.101	Mathematics	3	2
33.101	Physics	3	3
41.101	General Chemistry	3	3
41.103	Engineering Materials	2	3*
49.101	Draughting	—	3
41.102	Laboratory Workshop	—	3*
90.230	Business	2	1
	Tutorials	—	4
		15	20

Term 2

31.201	Writing and Contemporary Thought	2	1
32.201	Mathematics	3	2
33.201	Physics	3	3
41.201	General Chemistry	3	3
41.203	Engineering Materials	2	3*
49.201	Draughting	—	3
41.202	Laboratory Workshop	—	3*
	Tutorials	—	7
		13	22

YEAR 2 — *Term 3*

31.301	Writing and Contemporary Thought	1	1
32.301	Mathematics	3	2
41.301	Organic Chemistry (Chemistry Option)	2	4
41.302	Physical Chemistry	2	3
41.303	Analytical Chemistry	2	4
41.304	Physical Metallurgy (Metallurgy Option)	3	3
48.381	Instrumentation	—	3
47.341	Unit Operations	3	3
	Tutorials	—	2
		13/14	22/21

Term 4

31.401	Writing and Contemporary Thought	1	1
32.401	Mathematics	3	2
41.401	Organic Chemistry (Chemistry Option)	2	4
41.403	Analytical Chemistry	2	4
41.404	Physical Metallurgy (Metallurgy Option)	3	3
48.481	Instrumentation	—	3
47.441	Unit Operations	3	3
90.190	Work Study	2	—
	Tutorials	—	5
		13/14	22/21

* Alternate weeks.

General Prerequisite: Graduation on the University Entrance Programme.

Special Prerequisites: Mathematics 91, Chemistry 91.

Subjects Desirable but Not Essential (*see* General Requirements under Enrolment): Physics; Industrial Arts, 90 Series.

NOTE.—*See* page 52 for prerequisites effective September, 1967.

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.

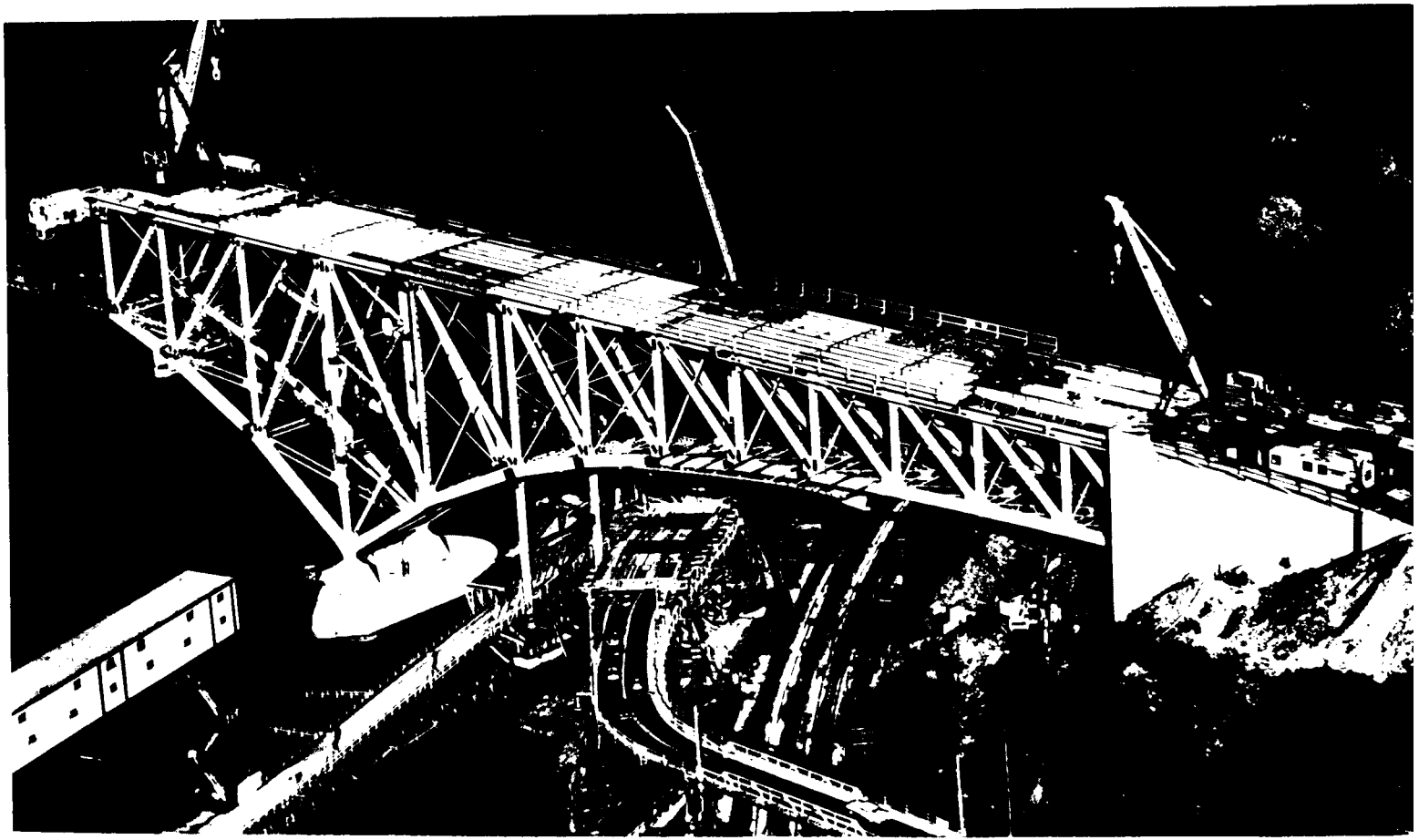
In Canada, and particularly in British Columbia, with the economy developing rapidly, a great demand exists for trained technicians. Specifically designed to train civil and structural technicians, this programme will provide a man with sufficient specialized knowledge to make him immediately capable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

No.	Subject	Hours per Week Lec.	Lab.
	YEAR 1 *Term 1*		
31.101	Writing and Contemporary Thought	2	1
32.101	Mathematics	3	2
33.101	Physics	3	3
49.101	Draughting	—	3
51.102	Surveying	—	3
42.101	Civil Engineering	1	3
42.102	Hydraulics	2	2*
42.103	Statics	2	2
42.104	Concrete Technology	1	2
	Tutorials	—	2*
		14	21
	Term 2		
31.201	Writing and Contemporary Thought	2	1
32.201	Mathematics	3	2
33.201	Physics	3	3
49.201	Draughting	—	3
51.202	Surveying	—	3
42.201	Civil Engineering	1	2
42.202	Hydraulics	2	2*
42.204	Design	2	2
42.205	Strength of Materials	—	3
	Tutorials	1	2*
		14	21
	YEAR 2 *Term 3*		
31.301	Writing and Contemporary Thought	1	1
32.301	Mathematics	3	2
51.304	Surveying for Civil and Structural	—	3
42.307	Soil Mechanics and Foundations	2	2
90.190	Work Study	1	2
42.308	Highway Engineering	2	2
42.301	Civil Engineering	2	2
42.306	Structural Design and Draughting	1	5
	Tutorials	1	3
		13	22

* Alternate weeks.

Term 4

No.	Subject	Civil Option Hours per Week Lec.	Lab.	Structural Option Hours per Week Lec.	Lab.
31.401	Writing and Contemp. Thought	1	1	1	1
32.401	Mathematics	3	2	3	2
51.404	Surveying for Civil and Structural	—	3	—	3
90.230	Business	1	1	1	1
90.351	Computer Programming	1	1	1	1
	Tutorials and Report	1	4	1	4
42.409	Public Services Engineering	2	3	2	1
42.410	Codes and Specifications	1	—	1	—
42.411	Costing and Estimating	1	2	1	2
42.407	Soil Mechanics and Foundations	1	2	—	—
90.491	Work Study	1	3	—	—
42.406	Structural Design and Draughting	—	—	1	6
42.412	Bridge and Building Practice	—	—	1	1
		13	22	13	22

General Prerequisite: Graduation on the University Entrance Programme.
Special Prerequisites: Mathematics 91, Physics 91.
Subjects Desirable but Not Essential (*see* General Requirements under Enrolment): Chemistry; Industrial Arts, 90 Series.

NOTE.—*See* page 52 for prerequisites effective September, 1967.

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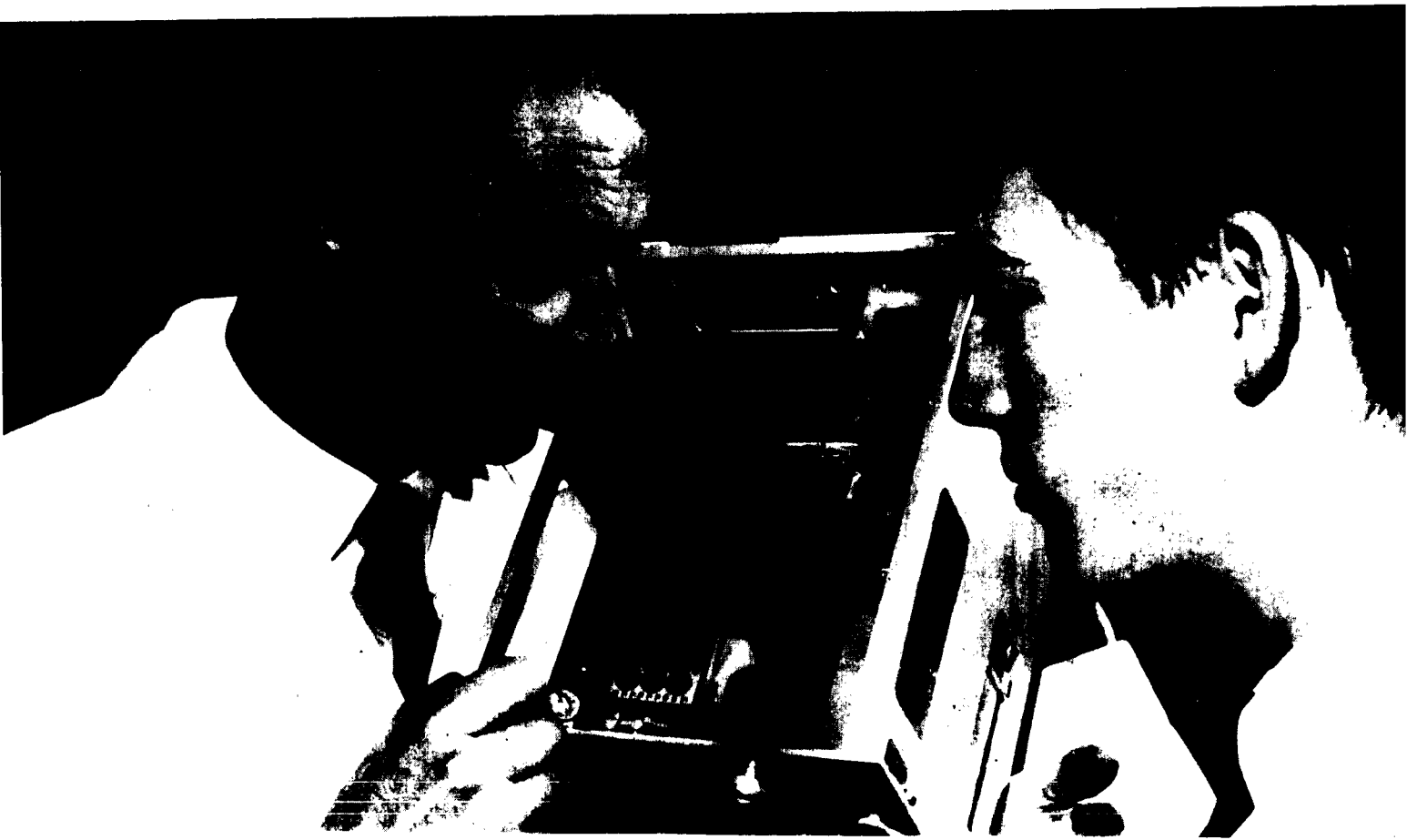
Electrical and Electronics Technology

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, 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 semi-professional level as an engineering assistant or its equivalent. 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 fields of instruction are offered — electric power and electronics. The programme in the first year is identical in both fields, with special emphasis on mathematics, physics, and electrical and electronic circuits. These courses form the foundation upon which can be built the skills of the technician. The second year courses include further foundation material, and also cover specific topics related to the particular option of the technology. For example, pulse circuits are studied by those students in the Electronics Option, and power systems by those in the Power Option. Laboratories are well equipped to demonstrate clearly the principles taught, and to permit further investigations by the student. Graduates from the Electrical and Electronics Technology programme will find employment in production, design, installation, testing, technical sales, marketing, estimating, and in many other activities with manufacurers, communication companies, power companies, contractors, government agencies, and others.



ELECTRICAL AND ELECTRONICS TECHNOLOGY

YEAR 1 — *Term 1*

No.	Subject	Hours per Week Lec.	Lab.
31.101	Writing and Contemporary Thought	2	1
32.102	Mathematics	5	4
33.101	Physics	3	3
49.101	Draughting	—	3
43.101	Semi-conductors and Tubes	2	3
49.166	Shop Practice	—	2
	Tutorials	2	5
		14	21

Term 2

31.201	Writing and Contemporary Thought	2	1
32.202	Mathematics	5	4
33.201	Physics	3	3
41.204	Chemistry	2	2
43.202	Circuits—Electrical and Electronic	3	6
49.201	Draughting	—	3
	Tutorials	—	1
		15	20

YEAR 2 — *Term 3*

		Power Option		Electronics Option	
No.	Subject	Hours per Week Lec.	Lab.	Hours per Week Lec.	Lab.
31.301	Writing and Contemporary Thought	1	1	1	1
32.302	Mathematics	3	2	3	2
43.303	Measurements	1	3	1	3
33.301	Physics	2	—	—	—
33.302	Physics	—	—	2	—
	Tutorials	—	4	—	4
90.351	Computer Programming	2	—	2	—
43.323	Electronic Circuits	—	—	3	3
43.324	Radio Circuits	—	—	2	3
43.321	Electrical Equipment	—	—	2	3
43.311	Electrical Equipment	4	6	—	—
43.313	Circuit Analysis	3	3	—	—
		16	19	16	19

Term 4

90.230	Business	1	1	1	1
43.404	Servos and Control	2	2	2	2
43.425	Pulse Circuits	—	—	3	3
43.426	Radar	—	—	1	2
43.427	Microwave Systems	—	—	1	2
43.429	Special Topics and Assignments	—	—	2	9
43.422	Industrial Electronics	—	—	1	2
43.428	Digital Techniques	—	—	1	2
43.419	Special Topics and Assignments	2	8	—	—
43.414	Power Systems	4	4	—	—
43.412	Industrial Electronics	3	3	—	—
43.411	Electrical Equipment	2	3	—	—
		14	21	12	23

General Prerequisite: Graduation on the University Entrance Programme.
Special Prerequisites: Mathematics 91, Physics 91.
Subjects Desirable but Not Essential (*see* General Requirements under Enrolment): Chemistry; Industrial Arts, 90 Series.

NOTE.—*See* page 52 for prerequisites effective September, 1967.

Food Processing Technology

Commercial food production is undergoing a technological revolution. The application of scientific methods is rapidly changing processes and improving food products. As a result, skilled persons, including technicians, are required to oversee and control the complex operations of modern food production. The Food Processing Technology programme is designed to provide these trained technicians.

The Food Processing Technology programme 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 will allow him to study the operations performed in commercial canning, freezing, dairying, brewing, meat and fish packing, milling and baking, feed manufacturing, and confectionery and specialty-products industries. Visits to government laboratories will provide an opportunity to observe food inspection and research facilities.

The graduate will be well qualified to seek employment in the many branches of the food industry and allied government agencies. 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.

The food industry is Canada's most stable business, being affected little by fluctuations in the economic climate. It is a large industry, with almost 40 per cent of our work force engaged in the production, processing, and distributing of food. Since this is an ever-expanding industry, there are consequently limitless opportunities for rewarding careers in it.

FOOD PROCESSING TECHNOLOGY

No.	Subject	Hours per Week Lec.	Lab.
	YEAR 1 *Term 1*		
31.101	Writing and Contemporary Thought	2	1
32.101	Mathematics	3	2
41.101	General Chemistry	3	3
33.102	Introductory Physics	4	3
44.101	Food Technology	2	3
44.121	Food Microbiology	2	4
	Tutorials		3
		16	19
	Term 2		
31.201	Writing and Contemporary Thought	2	1
32.201	Mathematics	3	2
41.201	General Chemistry	3	3
33.202	Introductory Physics	4	3
90.230	Business	1	1
44.201	Food Technology	2	3
44.221	Food Microbiology	2	3
	Tutorials		2
		17	18
	YEAR 2 *Term 3*		
31.301	Writing and Contemporary Thought	1	1
44.312	Food Analysis	2	3
44.301	Food Technology	2	3
41.309	Instrumental Analytical Methods	2	3
48.381	Instrumentation		3
44.341	Mechanics of Machines	2	3
44.311	Quality Control	1	3
	Tutorials		6
		10	25
	Term 4		
31.401	Writing and Contemporary Thought	1	1
44.412	Food Analysis	2	3
44.401	Food Technology	2	3
48.481	Instrumentation		3
44.402	Process Analysis	2	3
44.411	Quality Control	1	3
44.431	Sanitation	2	3
90.190	Work Study		2
	Tutorials		4
		10	25

General Prerequisite: Graduation on the University Entrance Programme.

Special Prerequisites: Mathematics 91; Chemistry 91.

Subjects Desirable but Not Essential (*see* General Requirements under Enrolment): Physics; Biology.

NOTE.—*See* page 52 for prerequisites effective September, 1967.

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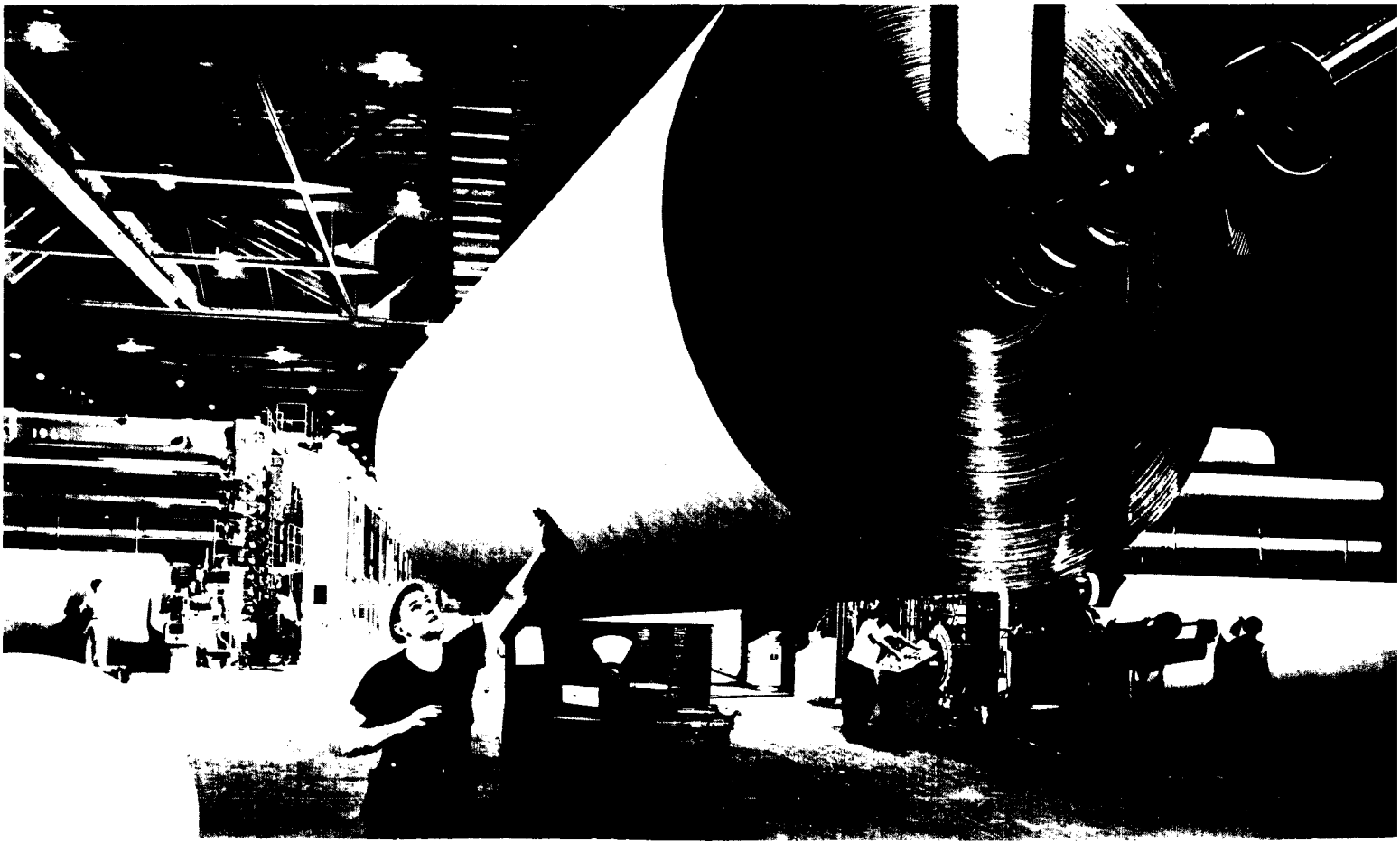
Forest Products Technology

The forest industry of British Columbia has undergone a marked change since the end of World War II. While a large proportion of the timber of the Province is still manufactured into lumber, the utilization of wood has become increasingly varied. Owing to the application of new principles and techniques to the pulp, paper, newsprint, plywood, and particle-board industries, increasing numbers of technical personnel are required. These industries offer challenging and rewarding employment for conscientious young men of ability and training.

The objectives of the Forest Products Technology programme are to qualify technicians 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 operations, research and development, quality control, and sales.

In addition to basic sciences, subject areas in the first year include botany, dendrology, wood technology, sawmilling, plywood manufacture, and pulp and paper production. This variety will assist the student in selecting one of two options offered during second year. The Wood Option includes the techniques and economics involved in harvesting wood and converting it to usable products such as lumber, laminated beams, plywood, and particle board. Wood seasoning, wood preservation, and fire-retardant treatments will also be introduced, as well as the integration of the forest industries for maximum utilization. The Pulp and Paper Option is concerned with the theory and practice of mechanical, semi-chemical, and chemical pulping, the bleaching of the various pulp types, and the conversion of pulp to useful products such as newsprint, paper, paper products, and textiles.

Laboratory and plant procedures required for product quality control are covered extensively in both options, and field trips to various related industrial operations are used to augment classroom and laboratory instruction. The courses common to both options provide the student with a sufficiently broad background of knowledge to permit him to progress within an advancing technology.



FOREST PRODUCTS TECHNOLOGY

No.	Year 1 — Term 1 — Subject	Hours per Week Lec.	Lab.
31.101	Writing and Contemporary Thought	2	1
32.101	Mathematics	3	2
33.102	Introductory Physics	3	3
41.101	General Chemistry	3	3
49.101	Draughting	—	3
41.103	Engineering Materials	2	3*
45.101	General Forestry	2	3*
45.107	Forest Utilization	2	3*
	Tutorials and Field Trips	—	3*
		17	18
	Term 2		
31.201	Writing and Contemporary Thought	2	1
32.201	Mathematics	3	2
33.202	Introductory Physics	3	3
41.201	General Chemistry	3	3
49.201	Draughting	—	3
41.203	Engineering Materials	2	3*
45.201	General Forestry	2	3*
45.207	Forest Utilization	2	3*
	Tutorials and Field Trips	—	3*
		17	18

* Alternate weeks.

No.	Year 2 — Term 3 — Subject	Pulp and Paper Option Hours per Week Lec.	Lab.	Wood Option Hours per Week Lec.	Lab.
31.301	Writing & Contemporary Thought	1	1	1	1
32.301	Mathematics	3	2	3	2
	Tutorials and Field Trips	—	2	—	3
90.230	Business	2	1	2	1
48.381	Instrumentation	—	3	—	—
47.341	Unit Operations	3	3	—	—
41.310	Chemical Laboratory Techniques	—	3	—	—
46.301	Pulp and Paper Technology	3	3	—	—
46.304	Pulp and Paper Testing	2	3	—	—
90.190	Work Study	—	—	1	2
43.331	Electrical Equipment	—	—	2	1
46.311	Wood Properties	—	—	2	3
46.314	Wood Processing	—	—	2	4
46.317	Quality Control and Marketing	—	—	2	3
		14	21	15	20
	Term 4				
31.401	Writing & Contemporary Thought	1	1	1	1
32.401	Mathematics	3	2	3	2
	Tutorials and Field Trips	—	3	—	3
90.351	Computer Programming	2	—	2	—
48.481	Instrumentation	—	3	—	—
47.441	Unit Operations	3	3	—	—
46.401	Pulp and Paper Technology	2	3	—	—
46.404	Pulp and Paper Testing	1	3	—	—
41.407	Wood Chemistry	2	3	—	—
49.470	Mechanical Equipment	—	—	2	3
46.411	Wood Properties	—	—	2	3
46.414	Wood Processing	—	—	2	4
46.417	Quality Control and Marketing	—	—	2	3
90.425	Personnel Administration	—	—	2	—
		14	21	16	19

General Prerequisite: Graduation on the University Entrance Programme

Special Prerequisites: Mathematics 91, Chemistry 91.

Subjects Desirable but Not Essential (*see* General Requirements under Enrolment): Physics, Industrial Arts, 90 Series.

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 prepare and lay out setting plans and cutting boundaries, mark timber, survey and construct roads; 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 and Contemporary Thought	2	1
32.101	Mathematics	3	2
49.101	Draughting	—	3
51.102	Surveying	—	3
45.101	General Forestry	2	3*
45.102	Forest Mensuration	2	3
45.110	Fire Protection	2	2
45.106	Photo Interpretation	—	3
45.107	Forest Utilization	2	3*
	Tutorials and Field Trips	—	2
		13	22

Term 2

31.201	Writing and Contemporary Thought	2	1
32.201	Mathematics	3	2
49.201	Draughting	—	3
51.202	Surveying	—	3
45.201	General Forestry	2	3*
45.202	Forest Mensuration	2	3
45.210	Fire Protection	1	3*
45.205	Logging	2	3
45.207	Forest Utilization	2	3*
	Tutorials and Field Trips	—	3*
		14	21

YEAR 2 — *Term 3*

31.301	Writing and Contemporary Thought	1	1
45.304	Forest Mensuration (Scaling)	1	5
45.305	Logging	1	3
45.308	Roads and Transportation	2	4
45.309	Silviculture	2	3
45.313	Forest Pathology	1	3
45.316	Forest Management	2	1
90.230	Business	2	1
	Tutorials and Field Trips	—	2
		12	23

Term 4

31.401	Writing and Contemporary Thought	1	1
45.409	Silviculture	2	3
45.408	Roads and Transportation	1	3
45.414	Forest Entomology	1	3
45.310	Fire Protection	1	3
45.403	Forest Mensuration (Cruising)	2	4
45.418	Forest Economics	2	0
90.190	Work Study	1	2
90.424	Personnel Administration	2	—
	Tutorials and Field Trips	—	3
		13	22

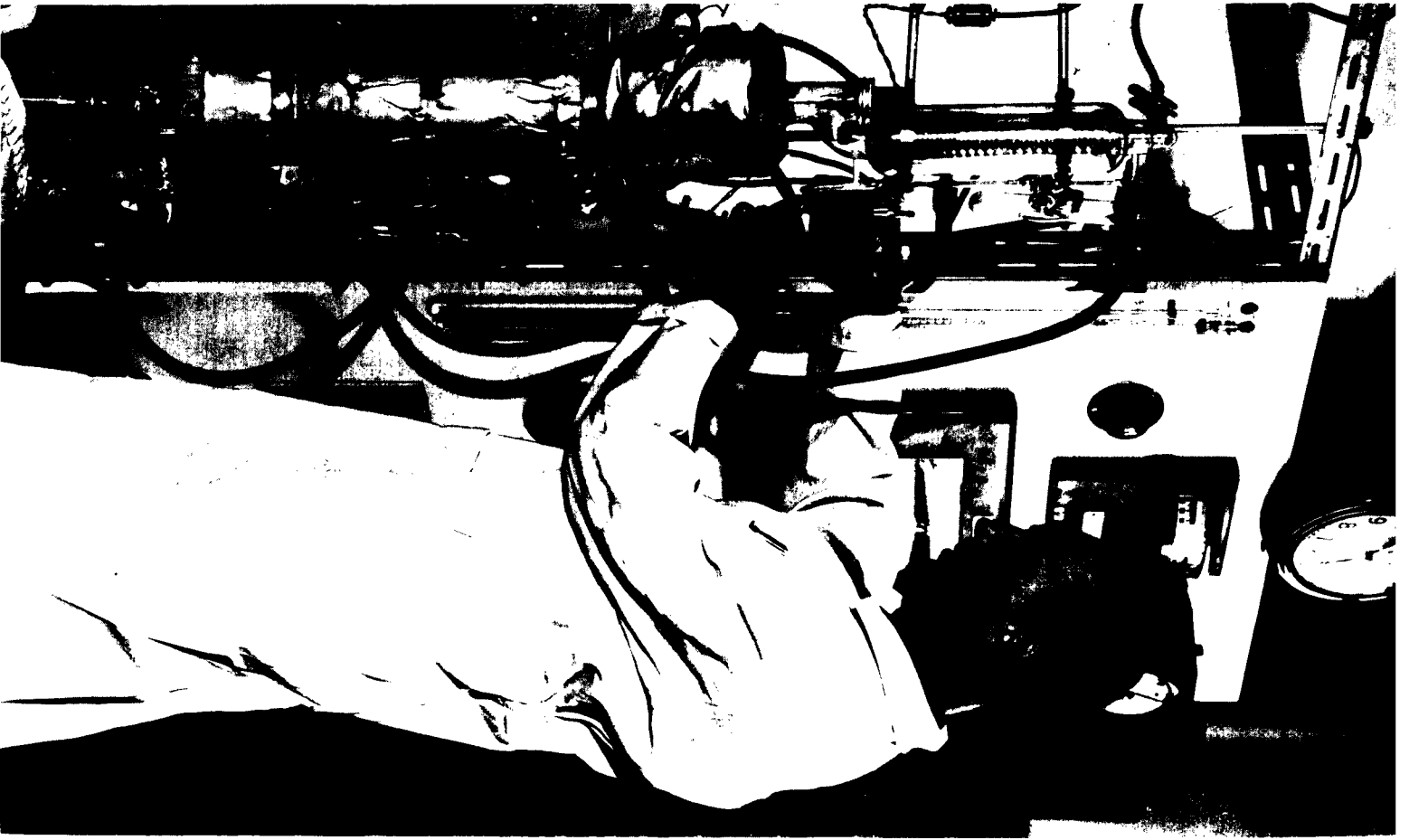
* Alternate weeks.

General Prerequisite: Graduation on the University Entrance Programme.

Special Prerequisite: Mathematics 91.

Subjects Desirable but Not Essential (*see* General Requirements under Enrolment): Biology; Physics; Industrial Arts, 90 Series.

NOTE.—*See* page 52 for prerequisites effective September, 1967.



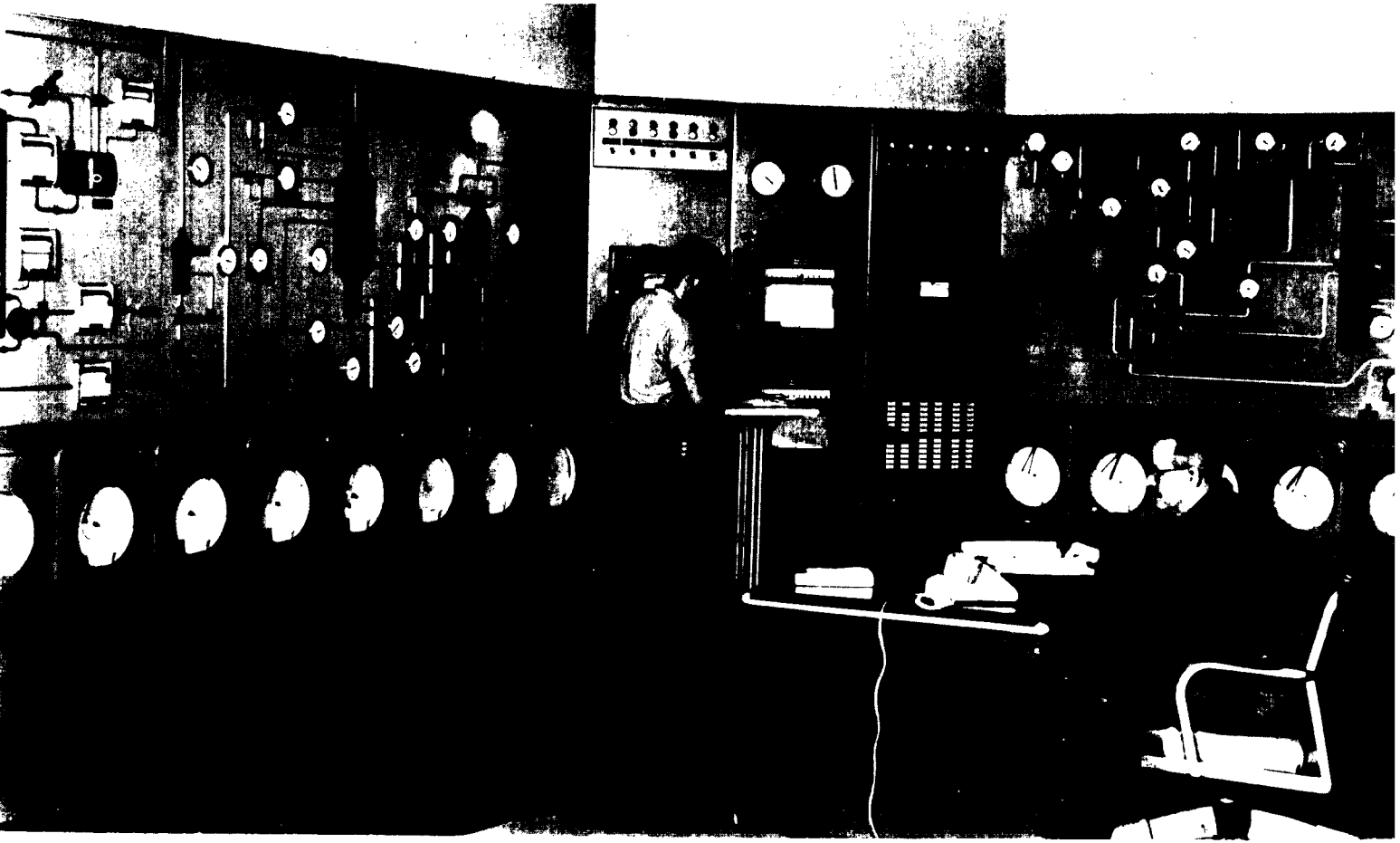
Gas and Oil Technology

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. In the second year, two options are offered. The Gas Technology Option will provide training in the distribution and utilization of gas in both industrial and domestic fields. There will be considerable emphasis on measurement and automatic control since the trend is toward completely unmanned automatic installations. The Oil Technology Option will provide training in the transmission of oil and its utilization in modern automatically controlled refineries. There will be more emphasis in this option on the chemistry of petroleum products. Both options will include a brief orientation course in business practices 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.



GAS AND OIL TECHNOLOGY

YEAR 1 — *Term 1*

No.	Subject	Hours per Week Lec.	Lab.
31.101	Writing and Contemporary Thought	2	1
32.101	Mathematics	3	2
33.101	Physics	3	3
41.101	General Chemistry	3	3
49.101	Draughting	----	3
41.103	Engineering Materials	2	3*
51.102	Surveying	----	3
49.166	Shop Practice	----	2
	Tutorials	----	2/5†
		13	22

Term 2

31.201	Writing and Contemporary Thought	2	1
32.201	Mathematics	3	2
33.201	Physics	3	3
41.201	General Chemistry	3	3
43.202	Circuits, Electrical and Electronic	3	3
48.201	Instruments	3	3
	Tutorials	----	3
		17	18

* Alternate weeks.
† Two hours one week and five hours the next week.

YEAR 2 — *Term 3*

No.	Subject	Hours per Week Lec.	Lab.
31.301	Writing and Contemporary Thought	1	1
32.301	Mathematics	3	2
47.341	Unit Operations	3	3
47.311	Gas and Oil Production and Transmission	3	3
41.302	Physical Chemistry	2	3
48.311	Process Control	3	3
90.190	Work Study	3	----
	Tutorials	----	2
		18	17

Term 4

31.401	Writing and Contemporary Thought	1	1
32.401	Mathematics	3	2
47.441	Unit Operations	3	3
90.230	Business	1	1
41.408	Organic Chemistry	2	3
90.351	Computer Programming	2	----
47.421	Distribution and Utilization (Gas Option)	4	4
47.431	Refining and Utilization (Oil Option)	4	4
	Tutorials	----	5
		16	19

General Prerequisite: Graduation on the University Entrance Programme.

Special Prerequisites: Mathematics 91, Physics 91.

Subjects Desirable but Not Essential (*see* General Requirements under Enrolment): Chemistry; Industrial Arts, 90 Series.

NOTE.—*See* page 52 for prerequisites effective September, 1967.

Hotel, Motel and Restaurant Management

The "hospitality" industry is in a state of rapid expansion. In 1964 receipts from tourists to Canada rose to over $660 million, from $600 million in 1963. By 1967, the year of the Montreal World's Fair, this figure could reach a billion dollars. 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 sanitation; design and decoration; 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 two 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 management positions. Eventual promotion to full managership is up to the individual.

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.
90.103	Business Mathematics	2	3
90.135	Economics	2	2
90.140	Accounting	2	3
90.131	Introduction to Business	2	1
31.102	Business Writing and Contemporary Thought	2	1
92.101	Front Office Management	2	2
92.102	Food and Beverages	3	2
92.111	English—Speech	—	2
	Tutorials	—	4
		15	20

Term 2

90.204	Business Statistics	2	3
90.235	Economics	2	2
90.240	Accounting	2	3
90.231	Introduction to Business	2	1
31.202	Business Writing and Contemporary Thought	2	1
92.203	Housekeeping and Bar Management	2	2
92.202	Food and Beverages	3	2
	Tutorials	—	6
		15	20

YEAR 2 — *Term 3*

92.312	Engineering and Maintenance	1	1
92.313	Hotel and Restaurant Accounting	2	2
92.314	Design and Decoration	2	2
90.373	Advertising and Sales Promotion	2	3
90.190	Work Study	1	2
92.302	Food and Beverages	3	7
90.360	Law and Government Regulation	2	1
	Tutorials	—	4
		13	22

Term 4

92.412	Engineering and Maintenance	1	1
92.413	Hotel and Restaurant Accounting	2	2
92.414	Design and Decoration	2	2
92.416	Human Relations	2	2
90.473	Advertising and Sales Promotion	2	3
92.402	Food and Beverages	3	7
90.460	Law and Government Regulation	2	1
	Tutorials	—	3
		14	21

General Prerequisite: Graduation on the University Entrance Programme.

Special Prerequisite: Mathematics 91.

Subjects Desirable but Not Essential (*see* General Requirements under Enrolment): English 91; French 30; Commerce 91; Typing 30.

NOTE.—*See* page 52 for prerequisites effective September, 1967.

VAPOR FRACTOMETER RECORDER

Instrumentation and Control Technology

Modern high-output production processes demand precise control of operating conditions in order to achieve satisfactory product quality at minimum cost. Industrial instrumentation provides a measurement of these operating conditions. Subsequent control can be carried out by the operator, but nowadays it is usually performed by automatic control built into the instrument. The installation and maintenance of measuring and automatic control devices are the functions of the Instrumentation and Control Technician. The equipment utilizes electronic, pneumatic, and hydraulic principles and is common to many industries such as oil and gas production and refining, pulp and paper production, atomic power-plant operation, plastics manufacture, food-processing, chemical-plant operation, primary-metals processing, and so forth. In these industries as much as 20 per cent of the capital cost may be accounted for by instrumentation, and this proportion is constantly rising as industrial processes become more complex.

The programme offered at the Institute covers in the first year the basic scientific and engineering principles used in the design and application of measuring instruments, as well as examples of the numerous commercially available versions. The primary measurements involved here are those of pressure, temperature, flow, and level. These are the variables most often controlled in industrial processes, and a wide variety of physical techniques is used for their measurement. In the second year, more complex commercial equipment will be studied, particularly modern electronic instruments, as well as the principles and practical applications of automatic control. A survey of typical industrial processes will be included since proper application of automatic control necessitates an understanding of the process being controlled as well as of the controlling equipment. Modern techniques such as telemetering and application of computers will be covered. In addition, there will be a brief orientation course in business practices.

A student desiring to enter this technology should be keenly interested in physics and mathematics and in putting his knowledge to practical use. Since this is a service to the production department of an industry, a willingness to devote one's energies to devising instruments for others is essential. The reward is the opportunity to use one's ingenuity in developing better devices, with small and sometimes delicate components, capable of controlling enormous production.

Opportunities for employment range from that of installing equipment to such functions as checking and calibrating, trouble-shooting and fault-finding under operating conditions, supervising of maintenance crews, and designing new applications and types of instruments. Further opportunities exist in the instrument-manufacturing industry for salesmen and field servicemen; also in laboratories containing specialized measuring equipment which requires maintenance by qualified instrument technicians. In these fields, exciting new developments are constantly taking place, so that an Instrument and Control Technician is assured of an interesting and rewarding career.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INSTRUMENTATION AND CONTROL TECHNOLOGY

YEAR 1 — *Term 1*

No.	Subject	Hours per Week Lec.	Lab.
31.101	Writing and Contemporary Thought	2	1
32.101	Mathematics	3	2
33.101	Physics	3	3
41.101	General Chemistry	3	3
43.101	Semi-conductors and Tubes	2	3
48.101	Instruments	3	3
49.166	Shop Practice	—	2
	Tutorials	—	2
		16	19

Term 2

31.201	Writing and Contemporary Thought	2	1
32.201	Mathematics	3	2
33.201	Physics	3	3
41.201	General Chemistry	3	3
43.202	Circuits, Electrical and Electronic	3	3
48.201	Instruments	3	3
	Tutorials	—	3
		17	18

YEAR 2 — *Term 3*

32.301	Mathematics	3	2
48.302	Advanced Measurements	3	3
47.341	Unit Operations	3	3
48.311	Process Control	3	3
48.351	Economics of Instrumentation	2	1
49.101	Draughting	—	3
90.351	Computer Programming	1	1
	Tutorials	—	4
		15	20

Term 4

32.401	Mathematics	3	2
48.402	Advanced Measurements	3	2
47.441	Unit Operations	3	3
48.411	Process Control	2	3
48.421	Telemeters and Computers	2	2
48.431	Electronics for Instruments	2	2
90.230	Business	1	1
	Tutorials	—	4
		16	19

General Prerequisite: Graduation on the University Entrance Programme.

Special Prerequisites: Mathematics 91, Physics 91.

Subjects Desirable but Not Essential (*see* General Requirements under Enrolment): Chemistry; Industrial Arts, 90 Series.

NOTE.—*See* page 52 for prerequisites effective September, 1967.

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.

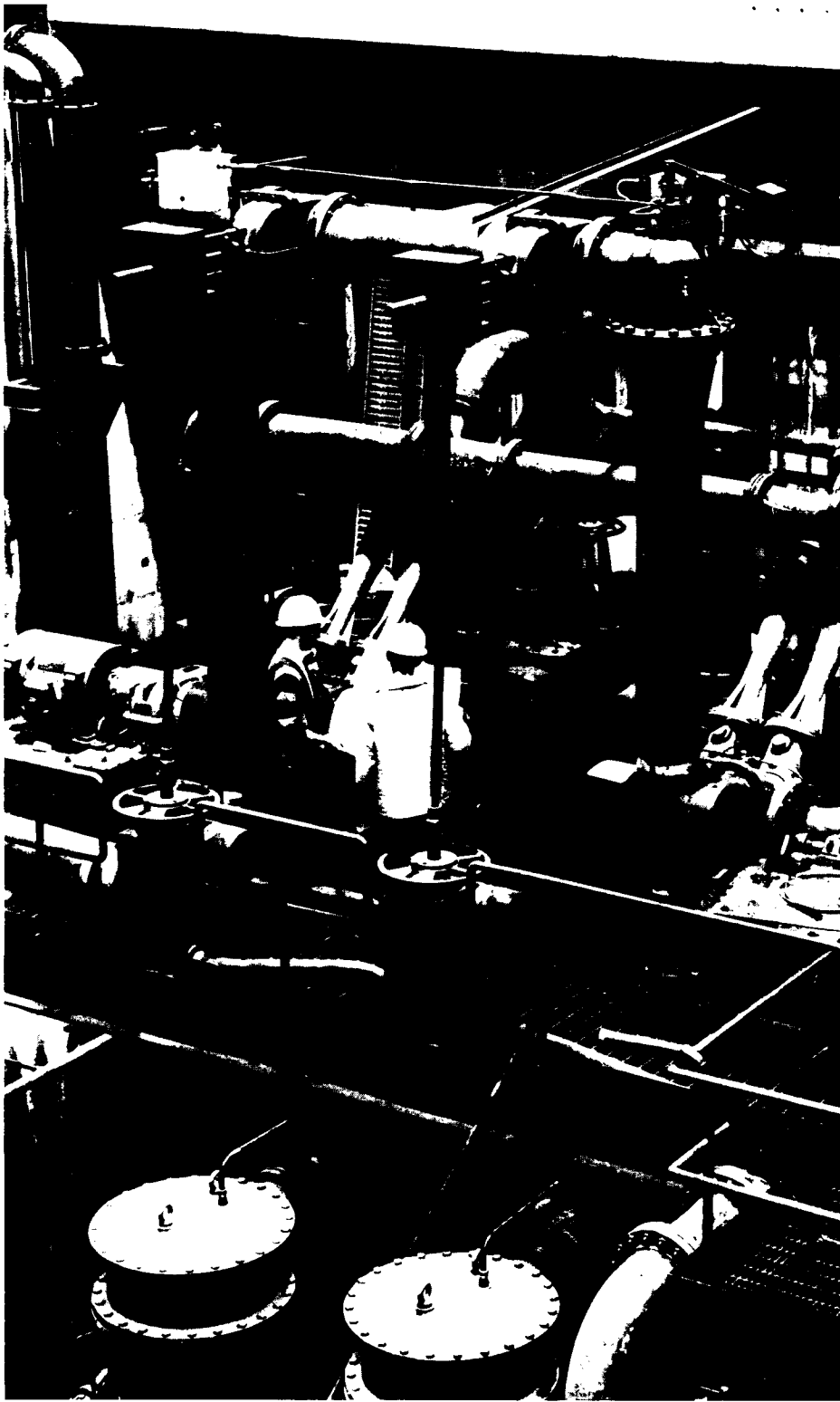
The two-year Mechanical Technology programme offers intensive training leading to graduation as a mechanical technician. Job possibilities include work in consulting engineering offices as mechanical design draughtsmen on machinery, steelwork, piping, power plants, and installation; in plant engineering 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, estimating, thermodynamics, electricity, and machine tools. Theory presented in lectures is directly applied in problem periods, design drawing sessions, and shopwork utilizing excellently equipped laboratories and shops. In the thermodynamics laboratory, for example, students will operate and test steam boilers, air compressors, a steam turbine, gas turbine, dual-fuel engine, and other equipment, while in the machine shop they will use engine lathes, milling machines, a turret lathe, jig borer, boring mill, precision grinders, punch press, and other modern equipment.

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

To span the broad field of Mechanical Technology, three options are planned, subject to adequate enrolment in each—(1) Production, (2) Design, (3) Plant Heat and Power. Choice of option will be made at the end of the first term of the second 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 technician must have completed the University Entrance Programme, including mathematics and physics, and should be able to apply ideas in practical situations. Because the mechanical technician 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.



YEAR 1 — *Term 1*

No.	Subject	Hours per Week Lec.	Lab.
31.101	Writing and Contemporary Thought	2	1
32.101	Mathematics	3	2
33.101	Physics	3	3
49.101	Draughting		3
49.105	Mechanics	2	3*
41.103	Engineering Materials	2	3*
90.190	Work Study	1	2
49.165	Shopwork		4
49.168	Machine Tool Theory	1	1
	Tutorials		2
		14	21

Term 2

31.201	Writing and Contemporary Thought	2	1
32.201	Mathematics	3	2
33.201	Physics	3	3
90.230	Business	1	1
49.201	Draughting		3
41.203	Engineering Materials	2	3*
49.210	Strength of Materials	3	3*
49.265	Shopwork		4
49.268	Machine Tool Theory	1	1
	Tutorials		2
		15	20

YEAR 2 — *Term 3*

31.301	Writing and Contemporary Thought	1	1
32.301	Mathematics	3	2
49.301	Draughting		3
49.312	Machine Design	3	2
49.315	Fluid Mechanics	2	2
49.320	Estimating	1	2
49.325	Thermodynamics	2	3
43.331	Electrical Equipment	2	1
49.365	Shopwork		3
49.368	Machine Tool Theory	1	1
		15	20

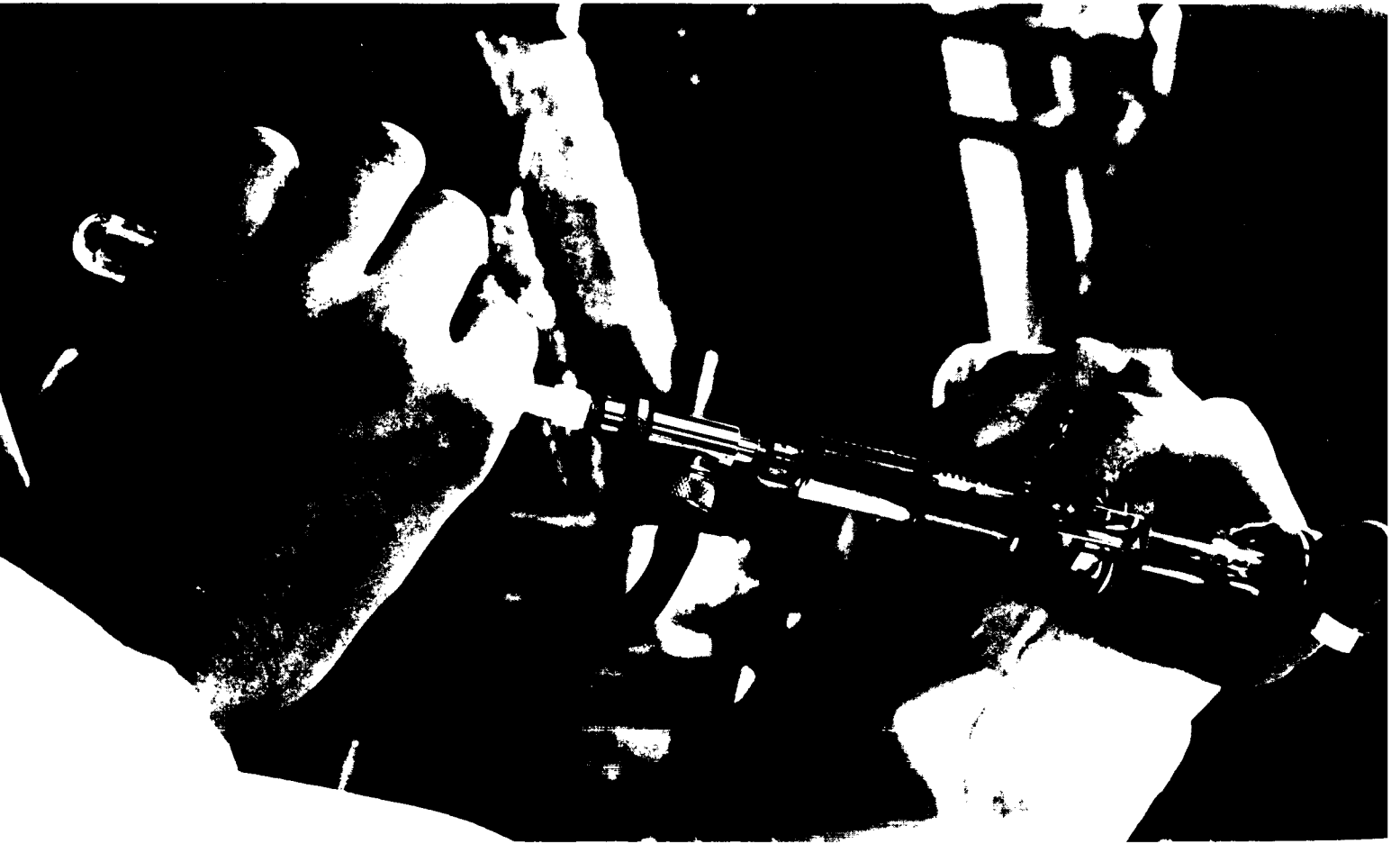
* Alternate weeks.

Term 4

		Production Hours per Week		Design Hours per Week		Plant Heat and Power Hours per Week	
		Lec.	Lab.	Lec.	Lab.	Lec.	Lab.
31.401	Writing & Contemporary Thought	1	1	1	1	1	1
32.401	Mathematics	3	2	3	2	3	2
	Tutorials		4		4		4
49.445	Manufacturing Processes	2	2				
49.450	Production Engineering	4	4				
90.491	Work Study	1	3				
49.455	Tool Design	1	2	1	2		
49.465	Shopwork		3		3		
49.468	Machine Tool Theory	1	1	1	1		
49.412	Machine Design			3	2	3	2
49.425	Thermodynamics			3	3	3	3
49.435	Hydraulic and Pneumatic Equip.			2	3	2	3
49.440	Refrigeration and Air Conditioning					2	2
49.460	Instrumentation and Controls					1	3
		13	22	14	21	15	20

General Prerequisite: Graduation on the University Entrance Programme.
Special Prerequisites: Mathematics 91, Physics 91.
Subjects Desirable but Not Essential (*see* General Requirements under Enrolment): Industrial Arts, 90 Series.

NOTE.—*See* page 52 for prerequisites effective September, 1967.



Medical Laboratory Technology

This programme provides the basic theoretical and practical portion of the 22-month course to prepare a student for the examination leading to certification as a Registered Technologist (R.T.) by the Canadian Society of Laboratory Technologists. General certification by this body qualifies the technologist for employment in any hospital or medical laboratory in Canada and in many other countries.

Candidates for this programme are accepted by one of the following training schools before being seconded to the Institute:

Vancouver General Hospital, St. Paul's Hospital, or Shaughnessy Hospital, Vancouver.

Royal Columbian Hospital, New Westminster.

Lions Gate Hospital, North Vancouver.

Royal Jubilee Hospital, St. Joseph's Hospital, or Veterans' Hospital, Victoria.

Provincial Mental Hospital, Essondale.

Royal Inland Hospital, Kamloops.

Division of Laboratories, Health Branch, Department of Hospital Services and Hospital Insurance (subject, bacteriology only).

The course consists of nine months' training at the Institute followed by 13 months at the laboratory of the associated training school approved by the Canadian Medical Association. A nominal monthly stipend will be paid by the hospital during this latter period.

The Institute has a fully equipped modern laboratory and a full-time instructional staff. In addition, guest and part-time lecturers, drawn from a wide range of specialist, professional, and technical personnel, will contribute to the programme.

Medical laboratory technology is a rapidly advancing branch of medicine, and developments in this field create a great need for skilled workers. Working in a clinical or medical research laboratory, the medical laboratory technologist performs the many scientific tests on which pathologists and other physicians rely for assistance in diagnosing and treating disease. They have an honoured place beside doctors and nurses on the health team. Employment is also open in governmental health and food laboratories and veterinarian, bacteriological, and similar laboratories.

Persons entering this field must have a strong interest in the sciences, including mathematics, and must be meticulous in their work, dress, and habits.

MEDICAL LABORATORY TECHNOLOGY

HOURS OF INSTRUCTION—35-WEEK COURSE

Subject to change.

No.	Subject	Lecture Hours	Laboratory Hours
80.001	General Knowledge and Introduction to the Clinical Laboratory	45	95
80.002	Histology	40	65
80.003	Medical Bacteriology	65	175
80.004	Urinalysis	38	88
80.005	Hæmatology	32	164
80.006	Blood Banking	35	112
80.007	Clinical Chemistry	65	175
80.008	Immunology	15	16
		335	890

Medical Radiography Technology

The British Columbia Institute of Technology provides the basic theoretical portion of a course which prepares the student for certification examinations of the Canadian Society of Radiological Technicians. The successful candidate becomes registered as "R.T.(R.)," qualified to work in diagnostic radiography. This registration is accepted across Canada and in the United States, Great Britain, Australasia, and many other countries.

Candidates for this programme are selected and enrolled by one of the following associated training schools which have been approved by the Canadian Medical Association:

Vancouver General Hospital, St. Paul's Hospital, or Shaughnessy Hospital, Vancouver.
Royal Columbian Hospital, New Westminster.
Lions Gate Hospital, North Vancouver.
Royal Jubilee Hospital or St. Joseph's Hospital, Victoria.
Dr. A. Turnbull and Associates, Vancouver.

Following a short period of indoctrination, students from the associated training schools are seconded to the Institute for the 19-week basic portion of the course. Following this phase, the students return to the associated training school for continued training, during which time the hospital provides a nominal monthly stipend. Provision may be made for the student to return to the Institute for a period of tutorial training prior to writing the Canadian Society of Radiological Technicians certification examination. No stipend would be paid for this period. The total training programme, with a minimum duration of 24 months, is governed by the rules and regulations of The Canadian Society of Radiological Technicians (B.C. Division), the basic standards being those prescribed by the national body of that Society.

A fully equipped modern X-ray department and related laboratories are available at the Institute. A full-time instructional staff, together with guest and part-time specialist lecturers, will provide the student with a sound knowledge of the basic sciences and techniques associated with radiography. Radiography, the exposing of film by means of X-rays to show the structures of the body, is a very important aid in the diagnosis of illness or injury. Persons in this field must have a strong sense of responsibility, a high degree of integrity, an interest in people, together with a desire to serve humanity in an effort to discover, prevent, and treat disease. This occupation is not dangerous to health as radiation hazards are well appreciated and any exposure to personnel is easily within the minimum acceptable range recognized by national and international authorities.

MEDICAL RADIOGRAPHY TECHNOLOGY

HOURS OF INSTRUCTION—19-WEEK COURSE

Subject to change.

No.	Subject	Lecture Hours	Laboratory Hours
81.001	Anatomy and Physiology	95	38
81.002	Physics of Medical Radiography	76	38
81.003	Radiographic Technique	70	25
81.004	X-ray Apparatus	38	19
81.005	Radiobiology and Protection	38	19
81.006	Related Radiomedical Studies:		
	(*a*) Radiographic Photography	30	9
	(*b*) Departmental Administration	24	----
	(*c*) History of Radiography	19	----
	(*d*) Nursing Essentials	10	4
	(*e*) Pathology*	19	----
	(*f*) Bacteriology*	9	----
	(*g*) Pharmacology*	9	----
	Study and Tutorials	76	----
		513	152

* Formal examinations are not conducted in these subjects.

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 five 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 and Contemporary Thought	2	1
32.101	Mathematics	3	2
33.101	Physics	3	3
41.101	General Chemistry	3	3
49.101	Draughting	---	3
41.103	Engineering Materials	2	---
51.102	Surveying	---	3
50.101	Geology	2	2*
50.102	Mining	2	---
	Tutorials	---	1/3†
		17	18
	Term 2		
31.201	Writing and Contemporary Thought	2	1
32.201	Mathematics	3	2
33.201	Physics	3	3
41.201	General Chemistry	3	3
49.201	Draughting	---	3
41.203	Engineering Materials	2	---
51.202	Surveying	---	3
50.201	Geology	2	2*
50.202	Mining	2	---
	Tutorials	---	1/3†
		17	18
	YEAR 2 *Term 3*		
90.230	Business	2	1
31.301	Writing and Contemporary Thought	1	1
32.301	Mathematics	3	2
42.103	Statics	2	2
41.305	Assaying (Laboratory Option)	1	6
41.306	Assaying (Mining Option)	1	3
51.305	Surveying (Mining Option)	---	3
50.301	Geology—Structural	2	3*
50.304	Mineral Processing	2	3*
50.302	Mining—Operation	2	---
50.303	Mining—Equipment	---	2
	Tutorials	---	3
		15	20
	Term 4		
31.401	Writing and Contemporary Thought	1	1
32.401	Mathematics	3	2
33.401	Geophysical Prospecting Methods	---	2*
42.205	Strength of Materials	---	3
42.202	Hydraulics	2	2*
41.405	Assaying (Laboratory Option)	1	6
41.406	Assaying (Mining Option)	1	3
51.405	Surveying (Mining Option)	---	3
50.401	Geology—Mineral Deposits	2	3*
50.404	Mineral Processing	2	3
50.402	Mining Operation	2	---
50.403	Mining Equipment	---	2*
	Tutorials	---	2/3*
		13	22

* Alternate weeks.

† One hour one week and three hours next week.

General Prerequisite: Graduation on the University Entrance Programme.
Special Prerequisites: Mathematics 91, Physics 91.
Subjects Desirable but Not Essential (*see* General Requirements under Enrolment): Chemistry; Industrial Arts, 90 Series.

NOTE.—*See* page 52 for prerequisites effective September, 1967.

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.

SURVEYING TECHNOLOGY

No.	Subject	Hours per Week Lec.	Lab.
	YEAR 1 *Term 1*		
31.101	Writing and Contemporary Thought	2	1
32.101	Mathematics	3	2
33.101	Physics	3	3
49.101	Draughting	----	3
51.101	Surveying	2	8
42.102	Hydraulics	2	2*
51.103	Natural Science	1	2
	Tutorials	----	1/3†
		13	22
	Term 2		
31.201	Writing and Contemporary Thought	2	1
32.201	Mathematics	3	2
33.201	Physics	3	3
90.230	Business	2	----
49.201	Draughting	----	3
51.201	Surveying	2	8
	Tutorials	----	6
		12	23
	YEAR 2 *Term 3*		
31.301	Writing and Contemporary Thought	1	1
32.301	Mathematics	3	2
51.301	Surveying	3	8
51.306	Astronomy	3	----
51.307	Photogrammetry	2	----
51.302	Description for Deeds	2	----
51.303	Draughting	----	6
	Tutorials	----	4
		14	21
	Term 4		
90.190	Work Study	----	2
31.401	Writing and Contemporary Thought	1	1
32.401	Mathematics	3	2
51.401	Surveying	2	12
51.406	Astronomy	2	3
51.407	Photogrammetry	2	2
	Tutorials	3	----
		13	22

* Alternate weeks.
† One hour one week and three hours next week.

General Prerequisite: Graduation on the University Entrance Programme.
Special Prerequisites: Mathematics 91, Physics 91.

NOTE.—*See* page 52 for prerequisites effective September, 1967.

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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:

31—English.
32—Mathematics.
33—Physics.
40—Building.
41—Chemical and Metallurgical.
42—Civil and Structural.
43—Electrical and Electronics.
44—Food Processing.
45—Forestry.
46—Forest Products Utilization.
47—Gas and Oil.
48—Instrumentation and Control.
49—Mechanical.
50—Mining.
51—Surveying.
80—Medical Laboratory.
81—Medical Radiography.
90—Business Management.
91—Broadcast Communications.
92—Hotel, Motel and Restaurant Management.

ENGLISH

31.101, 31.201 Writing and Contemporary Thought

The course will consist of two parts. Part A comprises a review of the principles of composition, emphasizing the two main prose forms, description and argument, and the methods of development writers commonly use for these forms; a brief survey of the history of English, the principles of semantics, and the logic of argument; and the application of all the preceding material to the writing of technical reports. Part B is concerned with the analysis of some major problems of the 20th century, as they are presented in modern literature.

31.102, 31.202 Business Writing and Contemporary Thought

This 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 some of the characteristics of modern society and with the effects of economics and science on contemporary thought.

31.201 *See* 31.101.

31.202 *See* 31.102.

31.301, 31.401 Writing and Contemporary Thought

The first part of the course continues the instruction in technical writing provided in the first year; the second year's work is mostly concerned with substantial writing projects, on topics arising out of the student's special field. The second part continues the attempt of the first year's work to analyse the social context of technology and the technician in the modern world, through the study of modern essays, short stories, and novels.

31.401 *See* 31.301.

MATHEMATICS

32.101 Mathematics

Angular measurement in degrees and radians. Applications of radian measure; angular velocity. The trigonometric functions of any angle. Graphs of the trigonometric functions. Application of trigonometry to vectors. Oblique triangles; the sine law; the cosine law; areas. Trigonometric problems in three dimensions. Inverse trigonometric functions. Systems of linear equations; applications; solution by determinants. Introduction to statistics; graphical representations; frequency distributions. Measures of central tendency; mean; median; mode. Measures of variability; mean deviation; quartile deviation; the standard deviation. Empirical curve fitting; method of least squares.

32.102, 32.202, 32.302 Mathematics

The topics for this complete course are the same as those under Mathematics 32.101, 32.201, 32.301, and 32.401, with applications throughout in the field of electrical and electronic technology, plus special topics such as the algebra of switching circuits.

32.104 Statistics

The meaning of statistics. Organization and presentation of data. Measures of central tendency and of dispersion. Frequency distributions. Significance of results. Regression and correlation. Test of a hypothesis. Prediction.

Such subsidiary topics in mathematics as are required.

32.201 Mathematics

Quadratic functions; radical equations. Polynomial equations. Complex numbers; algebraic, trigonometric, and polar forms; application to vectors. Fundamental trigonometric identities; trigonometric functions of sum and difference of two angles; double-angle formulas. Trigonometric equations. The binomial theorem for all real exponents; application to approximations. Theory of logarithms; the number *e;* natural logarithms. Inequalities. The straight line; inclination and slope. Limits. Slope of a curve. Instantaneous rate of change with physical applications. Differentiation and the derivative. Rules for differentiating functions of the type ax^n and sums of such functions, composite functions, products and quotients of functions, implicit functions. The second derivative. Applications of the derivative; maximum and minimum values; curve tracing; related rates. Integration as the reverse of differentiation; rules for integrating sums of functions of the type ax^n ($n \neq -1$); application to physical problems. The differential. Areas under curves related to integration; volumes of solids of revolution.

32.202 *See* 32.102.

32.301 Mathematics

Review of the statistical items discussed under Mathematics 32.101. Standard scores. Moments, skewness, and kurtosis. Probability; expectation. The binomial and Poisson distributions; the normal curve. Populations and samples; sampling techniques; sampling distributions. Problems of estimation; small samples and Student's t-distribution; confidence limits. Tests of hypotheses; significance. The chi-square distribution; goodness of fit. Control charts. Linear regression. Correlation; correlation coefficient. Rank correlation. Contingency coefficient. Time series; index numbers.

(NOTE.—In order that the student can acquire sufficient understanding to design his own computing techniques, instruction will be given in the use of desk calculating machines. It will cover the fundamental mathematical manipulations that lend themselves to machine calculations and the expression of these calculations in written programmes. The calculators will be available to facilitate the computations required in the above course.)

32.302 *See* 32.102.

32.401 Mathematics

Review of the calculus items discussed under Mathematics 32.201. Differentiation and integration of trigonometric functions. Differentiation and integration involving logarithmic and exponential functions. Further application of the derivative in problems involving rates of change, tangents to curves, motion in one or two dimensions, related rates, maxima and minima, solution of equations. The definite integral; application in problems involving areas, volumes, first and second moments, mean values, work, and other topics

pertinent to the technology. Curve sketching involving ideas as symmetry, asymptotes, existence, intersections. The conic sections and calculus problems associated with these. Parametric equations and their differentiation. Polar co-ordinates and graphs. Power series for elementary functions. Further methods of integration. Elementary differential equations.

PHYSICS

33.101, 33.201 General Physics

This course is designed to satisfy the background knowledge required in the various technologies and consequently covers elementary aspects of the various 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; calculus may be introduced near the end of the term. Thorough grounding in secondary-school physics is presumed.

33.102, 33.202 Introductory General Physics

This course covers approximately the same material as Physics 33.101, 33.201, but is designed for those technologies for which secondary-school physics is not a prerequisite.

33.201 *See* 33.101.

33.202 *See* 33.102.

33.301 Electricity and Magnetism

This course is designed for the Electrical Power Option in the Electrical and Electronics Technology. Electric forces and fields; Gauss's law; conductors; electric potential; capacity; dielectric materials; magnetic and Lorentz forces; magnetic fields; magnetic moments; Biot-Savart law; solenoids and toroids; Ampere's line integral law; magnetic materials, hysteresis and eddy currents; electromagnetic induction; Faraday's law; transformers, d.c. and a.c. motors and generators; mutual inductance; transients in R-C, R-L, and R-L-C circuits; steady state a.c.; modern developments—photoelectric emission, fusion power devices, atomic energy and electric power, fuel cells, magnetohydrodynamics.

33.302 Electricity and Modern Physics

This course is designed for the Electronics Option in the Electrical and Electronics Technology. Electric potential; Gauss's law; Poisson and Laplace equations; atomic structure; polarization; Band theory of metals, semiconductors and insulators; Fermi levels; generation and recombination of carriers, theory of semiconductor devices, including the diode; transistor, maser and laser; quantum effects; origin of spectral lines; Balmer series; the photo-electric equation; thermionic and field emission; nuclear structure and radioactivity.

33.401 Introduction to Geophysical Prospecting Methods

This course will stress points of particular interest to those engaged in exploring and developing mineral bodies, rather than those aspects of more

interest in oil exploration. Gravity methods: basic physical principles, Newton's law of gravitation, gravity gradients and curvatures; measuring instruments; gravity measurements on land and over water-covered areas; reduction and interpretation of gravity data; comparison to known geologic structures. Magnetic prospecting: basic concepts and definitions, magnetic susceptibilities of rocks; prospecting instruments; field procedures; air-borne magnetometer surveys; reduction and interpretation of data. Electrical and electromagnetic prospecting: electrical properties of rocks; self-potential and equi-potential methods; resistivity methods; inductive methods. Prospecting for radioactive minerals: fundamental principles; prospecting equipment; examples of radioactivity surveys.

81.002 The Physics of Medical Radiography

See 81.002 (Medical Radiography).

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.

Visiting lecturers.

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 Sciences. 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.

40.201 *See* 40.101.

40.202 *See* 40.102.

40.203 *See* 40.103.

40.204 Summer Project

Students will be required to prepare an illustrated report during the summer months and present it after the commencement of second year. Subject-matter and method of presentation will be decided in discussion with the staff.

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.

40.302, 40.402 Building Construction

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

Application of the above to the preparation of working drawings, in coordination with the courses in Building Structures and Building Sciences. 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.

40.401 *See* 40.301.

40.402 *See* 40.302.

40.403 *See* 40.303.

40.305 Estimating

Fundamentals of cost accounting; cost records; cost breakdown; unit costs; principles of quantity surveying; bill of materials; unit prices; proportionate allowances for labour, location, and time; approximate and quick estimating procedures.

40.306, 40.406 Materials and Specifications

Physical and chemical properties of building materials, their manufacturing processes and stock sizes and grades on the market.

Competitive bidding process; principles of specification writing; specifications by trades; standard codes and specifications.

Projects integrated with other courses.

40.307 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.

40.408 Construction Management

Organization and administration of construction; architect-engineer-contractor relationship; design-estimating-tendering process; co-ordination of labour and materials on site; fundamentals of good supervision; legal and financial aspects of contracting; R.A.I.C. standard documents; insurance, bonding, lien Acts, etc.

Work correlated with Work Study course. Visiting lecturers.

CHEMICAL AND METALLURGICAL

41.101, 41.201 General Chemistry

Atomic structure and bond types; stoichiometry; chemical equations; gas laws; liquids and solids; properties and types of solutions; acids and bases; chemical kinetics and electro-chemistry.

Inorganic qualitative analysis. Organic compounds: structure and classes, physical properties; saturated and unsaturated hydrocarbons; catalysts; acetylene; petroleum hydrocarbons, aromatic hydrocarbons, alcohols, ethers; aldehydes and ketones, carboxyls, amines; carbohydrates; amino acids and proteins; vitamins, hormones, and drugs.

41.102, 41.202 Laboratory Workshop

Use of hand and bench tools; soldering, brazing, gas welding, heli-arc welding, and other joining techniques. Glass-blowing techniques; repair of chemical glassware and construction of simple apparatus. Design and fabrication of apparatus for chemical and metallurgical laboratory use; consideration of problem, choice of materials, design of fittings, etc.

41.103, 41.203 Engineering Materials

Interatomic forces, bonding; crystal structure, imperfections, grain boundaries, grain growth; glassy state, ceramic materials; organic polymers, composite materials, organic cements; inorganic cements; elasticity, tensile strength, stress-strain curves; plastic deformation of ductile solids, work hardening, recrystallization; alloy systems, equilibrium phase diagrams; properties of alloys, phase transformations in solids; oxidation at high temperatures; corrosion in aqueous solution; protective coatings. Laboratory assignments in physical testing of materials, properties of materials in operating environments, and comparison of materials.

41.201 *See* 41.101.

41.202 *See* 41.102.

41.203 *See* 41.103.

41.204 Chemistry

Atomic structure and bond types; stoichiometry; chemical equations; gas laws; liquids and solids, properties and types of solutions; chemical kinetics, electro-chemistry, nuclear chemistry.

Laboratory experiments designed to illustrate the chemical properties and types of solutions; chemical kinetics, electro-chemistry, nuclear chemistry.

Laboratory experiments designed to illustrate the chemical principles above and applications of control instruments or processes largely dependent upon electrical energy.

41.301, 41.401 Organic Chemistry

Techniques of organic chemistry: boiling points, distillation, fractional distillation, melting points, crystallization, solvent extraction. Commercial preparations: pharmaceuticals, synthetic polymers, etc. Detailed analytical techniques used in the petroleum, petrochemical, food, pharmaceutical, and similar industries. Special emphasis on legal aspects of food and drug analysis.

41.302 Physical Chemistry

Physical properties and molecular structure; molecular weight, density, molar refraction, viscosity. Heats of neutralization, vaporization and solution; vapour pressure of a liquid; methods of determining molecular weight. Phase equilibria: mixtures; phase diagrams of binary systems, ternary systems. Chemical kinetics: methods of obtaining velocity constants. Surface chemistry: surface and interfacial tension, colloids, surface area; gas adsorption; electrophoresis. Conductance, transport numbers; dissociation constants, hydrolysis constant. Electrode potential: standard potentials, concentration cells, solubility product and e.m.f.; potentiometric titration and the pH titration curves.

41.401 *See* 41.301.

41.403 *See* 41.303.

41.404 *See* 41.304.

41.405 *See* 41.305.

41.406 *See* 41.306.

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 polarograph, spectrophotometer, colorimeter, gas chromatograph, refractometer, spectrograph, X-ray scintillometer, X-ray diffractometer, etc.

41.304, 41.404 Physical Metallurgy

Review of crystal structure of metals; nature and behaviour of solid solutions, phase diagrams of binary systems, the iron-iron carbide system. Steel metallurgy: austenite transformation, effect of cooling rate of structure, isothermic transformation; effect of alloying elements; hardenability. Heat treatment of steel: annealing, normalizing, hardening, martempering, austempering, nitriding, carburizing, controlled atmosphere, and salt-bath techniques.

Properties of the non-ferrous alloys: light-metal alloys, copper-base alloys, refractory-metal alloys.

Metallurgical testing, macro-etching; metallography, specimen preparation, choice of etchant; use of the microscope, microphotography.

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.

41.309 Instrumental Analytical Methods (for Food Processing Technology)

This course involves a critical review of basic theoretical concepts, instrument construction and operation, and general applications of the following methods: potentiometric methods, amperometric titrations, polarographic methods, visible spectrophotometry, ultraviolet spectroscopy, infrared spectroscopy, flame photometry, refractometric method, polarographic method, solvent extraction analysis, column chromotography, paper chromotography, nitrogen determinations, and radio-isotopes.

41.310 Chemical Laboratory Techniques (for Forest Products Technology)

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.

41.407 Wood Chemistry

Structure of the major wood components: extractives, lignin hemicellulose and cellulose and their distribution in the wood structure. Chemistry of wood itself. Chemistry of the wood components, particularly as related to commercial pulping processes. The chemistry of cellulose derivatives such as rayon, cellophane, tire cord, acetate, nitrate. The chemistry of bark.

41.408 *Organic Chemistry (for Gas and Oil Technology)*

This course will have a strong emphasis on hydrocarbons. Techniques of organic chemistry: boiling points, distillation, fractional distillation, melting points, crystallization, solvent extraction. The chemistry of petrochemicals. Detailed analytical techniques used in production of petroleum and petrochemicals.

CIVIL AND STRUCTURAL

42.101, 42.201 Civil Engineering

Historical development of civil engineering; introduction to general organization of construction projects; control of financial and technical aspects of construction.

Harbour and dock engineering; foreshore protection; river improvement; canals; drainage; irrigation; pollution and conservation. Problems involving associated subjects and principles.

Visiting lecturers and field trips.

42.102 Hydraulics

The hydrological cycle—run-off phase, hydrological equation. Precipitation—causes, characteristics, measurement, measuring devices. Snow—measurement, typical melting conditions, results of melt run-off. Hydrographs, mass curves, frequency curves, intensity curves, other graphical representation of data. Storms and statistical probability. Sub-surface water and simple ground-water surveys, infiltration, extraction of ground water, storage coefficients, maximum yield of wells. Stream-flow measurement, peak discharge and flood run-off, flow in open channels. Bernoulli equation, flow in pipes, simple pressure piped systems, waterworks equipment.

42.103 Statics

Historical development and relation to structural design; vectors; 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 bridge and building structures, retaining walls.

42.104 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, block, pipe, etc. Special topics—cold-weather concreting, colouring, finishing, additives.

Labortory experiments and a field trip.

42.120 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.

42.201 *See* 42.101.

42.202 Hydraulics

Hydrostatics, properties of fluids, pressure, centre of pressure; flow of fluids, equation of continuity, velocity head, venturi, jets; orifices; notch and weir, friction and pipe flow; Reynold's experiments, sudden stoppage, water hammer; viscous flow, laminar and turbulent; open channel flow, regular channels, hydraulic jump, irregular channels; backwater curve, dimensional analysis, dynamic similarity, model testing; meters, valves, pumps, and turbines.

Laboratory experiments form a basic part of this course.

42.204 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; deflexion 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.

42.205 Strength of Materials

Simple stresses; stress, strain elasticity; compound bars and columns; temperature stress; elastic limit; limit of proportionality; yield; ultimate; factor of safety; load factor; ductility; resilience; fatigue; shock.

Properties of sections; bending moments; shear forces; theory of flexure; 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.

42.220 Building Structures

Historical development of structural systems; contemporary structures; principles of structural design; detailed consideration of structural systems from beam and column to plates and shells; discussion of structural materials and their structural properties.

Loading types and assumptions; stress, strain, and elasticity; simple stresses; theory of bending; properties of sections; design of beams in steel and timber; tension members and connections; axially loaded columns; trusses and frames.

Problems in application of principles to structural elements and systems.

42.301 Civil Engineering

Dams, flood control, power developments; transportation engineering, railways, highways, airports, harbours; water supply and sewerage; tunnelling; bridges and buildings; municipal engineering, planning, city services.

Problems involving principles covered in associated subjects; visiting lecturers and field trips.

42.306 Structural Design and Draughting

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 and retaining walls; reinforcing detailing, scheduling, and placing; design of formwork.

Problems and experiments in application of principles to structures.

42.307 Soil Mechanics and Foundations

Fundamentals of geology; rocks and minerals; formation of soils; site exploration, methods of sampling, testing in-situ; classification of soils; the soil particles; structure of soils, porosity, void ratio, moisture content; permeability, ground-water movement, frost action; consolidation theory, settlement; shear strength and deformation; stability of slopes; bearing capacity; excavations; spread footings; piling; earth retaining structures.

Laboratory tests and field trips to construction sites form a large part of this introductory course.

42.308 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.

42.320 Building Structures

Combined bending and axial load; eccentric column in steel and timber; plate web girder; 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.

Brief introduction to soil mechanics, foundations, piling, and retaining walls.

Problems and experiments in application of principles to building structures.

42.406 Structural Design and Draughting

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.

42.407 Soil 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.

42.409 Public Services Engineering

Design of waterworks distribution systems; sprinkling and fire-protection effects; metering; services; rates and policies; pipe materials; trenching and backfilling; plans and records.

Design of sanitary and storm sewer systems and their outfalls; use of watercourses; pipe materials; trenching, bedding, and backfilling; services; rates, policies, and financing; plans and records.

Gas, power, and communications distribution problems and practices; public utilities use of the streets.

Garbage collection and disposal practices.

Oil lines, trolley cables, and railroads in streets; historical occurrence and suggested policies.

Street widths, street classifications, entries and driveways, typical underground sections and costs.

42.410 Codes and Specifications

A course in the practical use of English in defining requirements to ensure quality control in construction. A study of well-known traditional examples is included. The standpoints of designers, owners, contractors, builders, and governments will be discussed. The two principal approaches—method specification and performance specification—will be contrasted and evaluated for each type of construction activity discussed. The definition, elements, and " spirit " of a contract and common forms will be examined.

42.411 Costing and Estimating

Fundamentals of cost accounting; cost records; cost breakdown; unit costs; principles of quantity surveying; bill of materials; unit prices; methods of tendering; approximate and quick estimates; proportionate cost allowances for location, labour, and time.

Problems integrated with projects in other subjects. Field trips.

42.412 Bridge and Building Practice

Visiting lecturers will present practical problems and their solutions within the area of their specialty. Covering the fields of investigation, design, fabrication, and erection of bridges and building structures, job organization and control, project financing.

Site inspections will be arranged as an integral part of this course.

42.420 Building Structures

Reinforced-concrete beam, tension steel only; one-way and two-way slabs; compressive reinforcement; tee beam; axial and eccentric columns; simple footings and retaining walls; reinforcing detailing, scheduling, and placing; design of formwork.

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

Problems and experiments in application of principles to building structures.

ELECTRICAL AND ELECTRONICS

43.101 Semi-conductors and Tubes

Characteristics of vacuum and gas-filled diode and triode tubes, vacuum tetrode, pentode and beam power tubes, multi-function tubes. Characteristics of germanium and silicon diodes and transistors. Characteristics of Zener diodes and tunnel diodes. Preparation and interpretation of characteristic curves. Derivations of operating parameters from characteristic curves. Dissipation curves. Load lines. Operation of tubes and semiconductors with resistive loads. Use of multi-meter and vacuum-tube voltmeter in making d.c. measurements.

43.202 Circuits, Electrical and Electronic

A theoretical and practical study of the behaviour of electrical and electronic circuits. Circuit elements, their characteristics, units of measurement and schematic symbols. Electrical parameters. Characteristics of series, parallel and combination circuits. Bridge circuits. Phase relationships in a.c. circuits. Vectors. Circuit theorems and laws. T-Y conversions. Two-port circuit analysis. Impedance, admittance, and hybrid circuit parameters. Resonance. Application of circuit principles to simple power circuits employing batteries, electrical machines, and transmission circuits. Application of circuit principles to simple electronic circuits employing solid-state devices and electron tubes.

43.303 Measurements, Electrical and Electronic

A lecture and laboratory study of the principles and applications of electrical and electronic measuring instruments. Résumé of basic electrical parameters. Moving coil meter movement, its principle and its direct application in volt-meters, ammeters, and ohmmeters. The bridge principle and its application to the measurement of resistance, impedance, and admittance. Electronic volt-meters, ammeters, and ohmmeters and their application. The dynamometer movement, its principle and its application in watt-meters. The watt-meter. The watt-hour meter. The cathode ray oscilloscope, its principle and its application to the measurement of voltage, frequency, period, and phase. Tube and transistor testers and their application. The meg-ohmmeter. Measurements in magnetic circuits.

43.311, 43,411 Electrical Equipment (Power Option)

Theory, characteristics, and operation of alternating-current and direct-current machines and equipment involved in the generation and distribution of electric power, and in its conversion for use as other forms of energy. Generators, transformers, a.c. and d.c. motors and controls, rectifiers, regulators, high-voltage switch gear, low-voltage switch gear, heating devices, lighting equipment, and their application to use in industry and utilities. Economics of applications.

43.313 Circuit Analysis

Methods of analysing circuits, network theorems, d.c. circuits, single- and three-phase a.c. circuits, phase relations, transmission-line equivalent circuits, symmetrical components, short-circuit calculations.

43.321 Electrical Equipment (Electronics Option)

A service course covering the principles and operation of the equipment involved in the generation, transmission, and distribution of electric power; its conversion to useful forms of energy by electric motors, heating and lighting equipment; and related control devices.

43.323 Electronic Circuits

Résumé of the characteristics of semi-conductor devices and electron tubes—their use with resistive loads. Rectification in half-wave, full-wave, bridge and voltage doubling circuits. Filters for use with rectifying circuits. Amplification. Amplifier configurations. Biasing. Inter-stage coupling networks. Voltage and power amplifiers. Audio, video, and radio frequency amplifiers. Regeneration and degeneration. Effects of degeneration on amplifier performance. Oscillation. Oscillator circuits. Voltage regulator circuits.

43.324 Radio Circuits

Outline of typical radio systems. Types of modulation. Block diagrams of typical transmitters and receivers. Basic receiver circuits including radio frequency amplifiers, converters, intermediate frequency amplifiers, limiters, detectors, discriminators, a.g.c. systems, a.f.c. systems, beat frequency oscillators, noise limiters, audio frequency amplifiers, video frequency amplifiers. Typical complete receiver circuits. Basic transmitter circuits including oscillators (free-running and crystal controlled), frequency multipliers, radio frequency power amplifiers, antenna coupling networks, amplitude, frequency and phase modulation systems. Special considerations for the operation of receivers and transmitters at v.h.f. and u.h.f. Transmission-lines. Antennæ.

43.331 Electrical Equipment

Theory, characteristics, and operation of a.c. and d.c. machines, control and switching devices, and equipment used in plant power systems, heating devices, lighting, economics.

43.404 Servos and Control

Theory, principles, characteristics, and operation of servo mechanisms; applications in control systems; transmission of data and other signals; feedback in closed loop systems. Economics and use in industry.

43.411 *See* 43.311.

43.412 Industrial Electronics (Power Option)

Review of the theory and characteristics of electronics which apply to electronics devices used in industrial applications: rectifiers, amplifiers, timing circuits, thyratrons, photo-electronic devices, magnetic amplifiers. The application of electronic principles and devices in measuring of industrial processes, controlling industrial drives and equipment, and automation of processes; transducers, electronic regulators, motor controls, servo mechanisms, closed loop control. This course relates electronics to electrical equipment and their co-ordinated application in industry.

43.414 Power Systems

A study of electrical systems used in the generation, transmission, distribution, and use of electric power, including characteristics of conductors, lines and networks, systems operation, regulation, relaying, protection, economics.

43.419 Special Topics and Assignments (Power Option)

This course involves an individual assignment to carry out the investigation and development of a project in a field which the student finds of particular interest. Special drives and their characteristics, special motor control systems, high-quality regulation of machines are a few examples. In addition, topics of a special nature embracing material related to several courses previously covered will be dealt with in more detail.

43.422 Industrial Electronics (Electronics Option)

Special requirements of components for industrial circuits. Saturable reactors, thyratrons, ignitrons, solid-state rectifiers, silicon controlled rectifiers, the amplidyne. The magnetic amplifier. D.c. and a.c. timing circuits. Sequence timing. Phase control of thyratrons, ignitrons, and silicon controlled rectifiers. Sensing temperature, pressure, rate of flow, humidity, strain. Welding control circuits. Motor and generator control circuits. Position and side register circuits. Radio frequency heating. Application of oscillators and amplifiers to industrial circuits. Application of servo mechanisms to industrial circuits.

43.425 Pulse Circuits

Time constants, resistance-capacitance and resistance-inductance. Behaviour of r.c. and r.l. circuits with transient waveform supply. Differentiation and integration. Limiting circuits. Clamping circuits. Counting circuits. Relaxation oscillators. Generation of square, pulse, sawtooth, and trapezoidal waveforms. Pulses and delay lines. Deflection generators for cathode ray tubes. Principle of television transmission and reception. Application of pulse techniques to communications, television, and measuring instruments.

43.426 Radar

Principle of pulse and doppler radar. Types of display used in pulse radar. Basic calculations involved in pulse radar. Block diagram of typical pulse radar system. Radio and intermediate frequency sections, detector and video frequency amplifiers of typical pulse radar set. Pulse generator of typical radar. Typical calibration system. Special features inherent in the various pulse radar display systems. Antenna position relaying systems. Determination of target range, azimuth and height. Typical doppler radar system block diagram and details of special interest. Antenna systems for radar use. Application of radar principles for general surveillance, weather prediction, marine and aviation use.

43.427 Microwave Systems

Special considerations involved in high frequency operation in electronics. Semi-conductors and tubes designed for very high frequency operation (tunnel diodes, special transistors, klystron, magnetron, and travelling wave tubes). Wave guides, cavity resonators, directional couplers, microwave attennuators. Microwave antennæ. Coupling energy into and out of microwave transmission systems. Microwave wave-meters, frequency meters, v.s.w.r. meters, and power meters. Microwave measurements. Application of microwave principles to communications and radar systems. Industrial applications of microwaves.

43.428 Digital Techniques

Principles of logic and logic symbols. Basic logic circuits. Arithmetic circuits. Flip-flops as storage elements. Shift registers. Core, drum, and tape memory principles. Principles of the application of digital techniques to computers, communications, and industrial electronics.

43.429 Special Topics and Assignments (Electronics Option)

This course deals with miscellaneous subjects and techniques not specifically covered by other courses in the electronics programme. In addition, a major investigation and development project is assigned. Propagation of electromagnetic waves. Basic outline of maser and laser operation and use. Telemetry. Sonar. Performance measurements on electronic systems. Special communications systems and circuits. Some aspects of aircraft navigation systems. Medical electronics. Electronics in surveying. The analog computer.

FOOD PROCESSING

44.101, 44.201 Food Technology

The composition of foods. Nutritional aspects. An introduction to the processes of canning, freezing, pasteurizing, dehydrating, smoking, fermenting, salting, and brining. Experimental lots of food will be preserved by these methods during laboratory periods.

44.121, 44.221 Food Microbiology

The use and care of the microscope. The isolation of bacteria for purposes of differentiation and classification by morphological, cultural, and biochemical methods. The characteristics of yeasts and moulds. Microorganisms of importance in fresh and preserved foods. Food fermentations. Contamination and spoilage of foods and means of control.

44.201 *See* 44.101.

44.221 *See* 44.121.

44.301, 44.401 Food Technology

Detailed studies of specific food-manufacturing processes, including dairy-products manufacture, fruit and vegetable processing, jams and jellies, fish and meat products, salad dressing and mayonnaise, processed potato products, dehydrated and freeze-dried foods, edible fats and oils, feeds, confections and products of milling and baking. Characteristics of packaging materials, including flexible films and how they meet the package requirements of various food products. Modern methods of materials handling.

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 product quality. 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, 44.412 Food Analysis

Methods of collecting and preparing samples for chemical analysis. Objective methods for the evaluation of food constituents and characteristics.

Techniques suitable for use in the control laboratory. The interpretation of analytical results as they pertain to food quality.

44.341 Mechanics of Machines

Basic mechanical principles. Power transmission, fluid mechanics, heat transfer, steam and its use in the food plant, refrigeration, evaporation, size reduction, materials of construction, corrosion, maintenance and lubrication. Laboratory exercises will be chosen to represent food-industry equipment.

44.401 *See* 44.301.

44.402 Process Analysis

Consists mainly of practical laboratory work and visits to representative food industries to acquaint the student with commercial manufacturing, packaging, and finished-product handling of foods. Equipment layout and principles of product flow within the food plant will be studied.

44.411 *See* 44.311.

44.412 *See* 44.312.

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.

FORESTRY

45.101, 45.201 General Forestry

Fundamental concepts of forestry, general history and importance of forestry in British Columbia and North America. Forest agencies, public and industrial. Botany, tree and plant identification and classification. Wood technology, structure and properties. Multiple-use aspects, including recreation, wildlife, fish, power, and grazing.

45.102, 45.202 Forest Mensuration

Methods of measurement of standing and felled timber. Direct measurement of tree diameters, heights, and ages. Use and construction of volume, stand, growth, and yield tables. Measurement of site index. Forest inventory techniques, compilation of forest data, elementary statistical analysis. Reproduction surveys. Cruising for quantity and quality. Log scaling and grading theory. Extensive field work in timber measurement and estimation.

45.106 Photo Interpretation

Practical use and application of aerial photography in forestry. Mapping topography and forest types. Introduction to photo interpretation, use of stereoscopes, scales, transfer equipment, and indices. Limitations to and use of photos in reconnaissance, planning, and inventory.

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, 45.210, 45.310 Fire Protection

Historical review, principles of combustion, fire weather and its measurement. Factors influencing forest inflammability, fire danger, hazard, fuels. Fire behaviour, prevention, occurrence, and development. B.C. Forest Service and industrial pre-organization, detection. Fire control, reconnaissance by air and ground. Water and chemicals. Use of bulldozers, crew organization and fire camps, transportation and communication. Reports, mapping, personnel, first aid. Fire legislation. Special equipment. Recent advances.

45.201 *See* 45.101.

45.202 *See* 45.102.

45.205, 45.405 Logging

History and development of logging. Description of systems most commonly used on the B.C. Coast and Interior. Layout and construction of settings, roads, and landings. Pre-logging, salvage and thinning. Equipment developments. Logging plans. Camp location, construction and maintenance. Woods organization and safety. Contracts and costs.

45.207 *See* 45.107.

45.210 *See* 45.110.

45.304 Scaling

Instruction in log scaling for Coastal and Interior operations. Scaling for woods records and inventory. Cubic- and board-foot log scales. Conversion factors and volume calculations.

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. Rail transportation.

45.309, 45.409 Silviculture

Introduction to elementary silvics, silvicultural principles and systems and 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 B.C. species. Forest soils. Forest-stand types and relation to logging planning. Regional silviculture—Coastal, Interior. Introduction to genetics and ecology, forest classification.

45.310 *See* 45.110.

45.313 Forest Pathology

Elementary study of forest-tree diseases in British Columbia. Relative importance of various groups of diseases—root rots, trunk rots, foliage diseases, etc. Effects on development and management of stands. Control of disease through silvicultural practices. Research projects.

45.403 Cruising

Field application of cruising techniques. Office compilation and cruise report preparation. Volume and quality cruising for inventory and logging development. Preparation of forest maps. Familiarization with B.C. Forest Service cruising systems and maps. Timber-sale applications and examinations. Stump cruises.

45.405 *See* 45.205.

45.408 *See* 45.308.

45.409 *See* 45.309.

45.414 Forest Entomology

Forest insect problems in Canada and British Columbia. Recognition of damage in standing and felled timber. Major types of harmful insects. Effects on timber stands and forest products. Control measures.

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.

45.418 Forest Economics

Logging cost appraisals based on field data. Stumpage appraisal: principles, methods and application of estimations of value of standing merchantable timber. Principles of forest valuation, immature forests, forest properties. Damage appraisal. Insurance.

FOREST PRODUCTS

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. Fibre morphology. Wood chemistry. Preparation of wood. Water treatment. Principles of pulping. Mechanical, semi-chemical, and chemical pulping. Fibreboard manufacture. 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. Papermaking and paper-board manufacture. Paper converting. Microbiology of pulp and paper. Auxiliary mill equipment. Mill instrumentation. Materials of construction. Mill hazards and safety. Pulp and paper marketing and distribution. 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. Beater and

freeness testing. Sheet-making. Physical tests, including basis weight, caliper, density, brightness, opacity, stiffness, absorbency, porosity, smoothness, dirt count, fibre classification. Chemical tests, including acidity, alkalinity, pH, alkali solubility, ash, resin, viscosity.

46.311, 46.411 Wood Properties

Wood anatomy in relation to physical properties and quality. Wood identification. Wood defects. Ornamental features. Physical and mechanical properties of woods. Fuel value. Chemical composition and identification. Properties and uses of important native species. Important foreign woods.

46.314, 46.414 Wood Processing

Log preparation, bucking, sorting, barking. Lumber and plywood manufacture. Chipping, wood seasoning, preservation. Fire retardants. Wood and adhesives, laminated woods. Edge and end gluing. Composition boards. Round timbers and modified wood products. Millwork.

46.317, 46.417 Quality Control and Marketing

Grades and sizes. Product development, packaging, shipping, merchandising. Inventory control. Export and local market requirements. Research developments.

46.401 *See* 46.301.

46.404 *See* 46.304.

46.411 *See* 46.311.

46.414 *See* 46.314.

46.417 *See* 46.317.

GAS AND OIL

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

Piping, pipe fittings and valves, fluid flow in pipes and channels. Pumps, compressors, turbines, steam and internal-combustion engines, electric motors. Principles and application of equipment for distillation, extraction, gas absorption, heat exchange, filtration, drying, size reduction, and separation, refrigeration, agitation, evaporation, industrial safety.

47.421 Distribution and Utilization (Gas)

City gas 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.

47.431 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.

INSTRUMENTATION AND CONTROL

48.101 Instruments

Measurement as basis of control. Instrument characteristics and classification. Principles of operation, commercial examples and practical work with primary measuring elements for pressure and temperature. Methods of calibration. Methods of installation.

48.201 Instruments

Principles of operation, commercial examples and practical work with flow measuring and level measuring devices for fluids and solids. Theory of fluid mechanics, orifice plates, venturis, nozzles, design calculations, installation precautions and procedures.

48.302 Advanced Measurements

Principles of operation, commercial examples and practical work with instruments for measurement of density, viscosity, moisture content, weight, thickness, velocity, direction, etc. Applications of radioactivity to commercial measuring devices.

48.311 Process Control

Introduction to principles and function of process control. Closed and open loops. Theory and applications of basic modes of control—on-off, proportional, reset, and derivative. Pneumatic controller mechanisms, hydraulic controller mechanisms, electronic controller mechanisms—commercial examples of these and practical work with them.

48.351 Economics of Instrumentation

Introduction to the economic principles involved when considering new plant. Instrumentation as a means to improved quality and quantity of output. Costs and depreciation. Layout of specific types of instrumentation. Presentation of reports.

48.381 Instrumentation

Principles of measurement. Instrument classification. Types and characteristics of servomechanisms. Installation and calibration. Emphasis is on laboratory instruction with wide range of instruments.

48.402 Advanced Measurements

Principles of operation, commercial examples and practical work where possible, with analysis and laboratory instruments, including pH measurement, oxidation-reduction, conductivity, gas analysis, spectrometry, chromatography, paramagnetism, thermal conductivity.

48.411 Process Control

Controlled systems. Effects of transfer lag and dead time. Theoretical analysis. Cascade and multi-element control systems. Time schedule control.

Characteristics of control valves—turndown and rangeability, by-passing, valve positioners, valve sizing, types of valve trim and construction.

48.421 Telemeters and Computers

Communication over long distances. Merits of digital and analogue systems with regard to information and remote control. Process simulation. Analogue computers and their use in process work.

48.431 Electronics for Instrumentation

A detailed study of electronic circuits as used in specific commercial instruments will be carried out.

48.481 Instrumentation

Principles of control. Temperature, pressure and flow control experiments. On-off, proportional, reset, and derivative functions. Pneumatic, hydraulic, and electronic systems. Emphasis is on laboratory instruction with a wide range of instruments.

MECHANICAL

49.101, 49.201 Draughting

Orthographic and isometric projection; lettering; technical sketching; sections; conventional practices; dimensioning; threads and fasteners; working drawings; interpretation of architectural, structural, electrical, and piping drawings; intersections and developments; commercial reproduction techniques.

49.105 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.

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; fits and tolerances; heat treatment; tool sharpening; spark testing.

49.166 Shop Practice

A basic course designed to familiarize the student with shop tools and equipment and with shop terminology and established standards of workmanship. Demonstration and practice by the student are carried out to provide a good understanding of the subject.

49.168, 49.268, 49.368, 49.468 Machine Tool Theory

Study of modern machine tools, their history and development, as well as the range and application of each in the modern shop and industry.

49.201 *See* 49.101.

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.

49.265 *See* 49.165.

49.268 *See* 49.168.

49.301 Draughting

Further development of topics covered in 49.101 and 49.201. Piping drawings; welding drawings, limits and fits; finishes; complex surface developments.

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 will be 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 to verify lecture theory.

49.320 Estimating

Cost estimating as it relates to single projects, manufacturing processes, and tooling, including materials, direct and indirect labour, allowances, wastage, etc. Problem sessions will be devoted to development of typical cost analyses encountered in industry.

49.325, 49.425 Thermodynamics

Fundamentals of heat; properties of gases and vapours; use of steam tables and charts; simple heat engines; steam engines and turbines; internal-combustion engines; gas turbines; steam power plants; air compressors; Carnot and other gas cycles; heat transfer; laws of thermodynamics. Laboratory experiments include tests on steam and gas turbines, dual-fuel and gasoline engines, air compressors, boilers, and related 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, key seater, die sinker, and punch press; hardening and tempering; use of fine measuring tools.

49.368 *See* 49.168.

49.412 *See* 49.312.

49.425 *See* 49.325.

49.435 Hydraulic and Pneumatic Equipment

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.

49.440 Refrigeration and Air Conditioning

Principles of refrigeration; properties of refrigerants; coefficients of performance; refrigerant load calculations; commercially available equipment; heat transmission and losses; psychrometric properties of air; types of building heating systems; air flow measurement; duct design; building cooling and heating loads. Laboratory periods devoted to design problems and testing of equipment systems.

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 will be related to material covered in Engineering Materials and to training given in Shopwork 49.165 to 49.465. Field trips to appropriate local industries.

49.450 Production Engineering

Study of the problems and techniques of materials handling, plant layout, production planning, and quality control; relationship between good plant layout, efficient materials handling, and operating effectiveness; site evaluation; floor layouts; product and process layout schemes; materials-handling equipment; flow diagrams; use of templates and models.

Factors involved in preparation for manufacturing—process and operation selection, product design, equipment planning, balancing of productive units; requirements of and techniques used in quality control in manufacturing operation.

Laboratory sessions include application of theory and techniques to solution of simulated plant and production problems.

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.

49.460 Instrumentation and Controls

Methods of and devices for measurement of temperature, pressure, flow, level, weight, viscosity, speed, r.p.m., voltage, current, etc.; application of instruments and controls to equipment and processes; introduction to concepts of automatic control.

Laboratory periods to test, operate, and evaluate various common types of industrial devices in test set-ups and in actual installations on operating boilers and other Institute equipment.

49.465 *See* 49.365.

49.468 *See* 49.168.

49.470 Mechanical Equipment

A study of mechanical equipment relating to the development, transmission, application, and control of power with particular reference to the wood-processing industries. References to types of prime movers, speed conversions, drives, bearings, hydraulic and pneumatic systems will be included.

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

Nature of the mineral industries, search for economic mineral deposits: economics of mining, potential reserves, "average grade," mineral prices, costs; exploration of a mineral deposit, sampling campaigns, weighted arithmetic mean, confidence limit and reliability of an average; acquisition of title, the claim system; exploitation of deposits, choice between surface and underground methods, development patterns; planned systematic extraction terminology of mine development; classification of mining methods, description of common 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

Mining economics, total cost components, selection of equipment, utilization of equipment, break-even rate; breaking ground; ground support; ore and waste removal, chutes and handling systems; development drives, rounds, cycles, control; examples of mining practice; drainage, water sources, water removal or isolation; ventilation; accident prevention, occupational hazards and their control; Metalliferous Mines Regulation Act, equivalent regulations; production management, organization, control techniques.

50.303, 50.403 Mining—Equipment

Underground services: compressed air, power, water, ventilation. Compressed-air equipment, use and maintenance. Hoisting systems and their

maintenance. Power generation and distribution; d.c. and a.c. motors and generators for mine service; transformers and rectifiers. Mechanical design of gearing, V-belt drives, bearings, shafting, etc., for common mine service.

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; earthworks and route surveys; horizontal, vertical, and transitional 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, chains, stadia, and subtense bar; route survey and earthwork, site surveys, calculations relating to traverses, triangulation areas, and volumes; obtaining, recording, and plotting topographic detail; care, maintenance, and adjustment of equipment.

51.103 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.

51.201 *See* 51.101.

51.202 *See* 51.102.

51.301, 51.401 *Surveying*

Application of survey methods to construction surveys, topographic surveys, hydrographic surveys, and legal surveys; triangulation and trilateration; base-line measurement, use of electronic measuring devices; re-establishment of section and lot corners; subdivision of land; surveys under the *Land Act, Mineral Act, Highways Act, Special Surveys Act,* and *Petroleum and Natural Gas Act;* calculation of problems of closure, areas, circular curves, transitional curves, terminal curves, and the conversion of geodetic co-ordinates to geographic co-ordinates; adjustment of elevations, adjustment of figures, reliability of observations, and rejection of observation.

51.302 Description for Deeds

Purpose and characteristics; 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.

51.303 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.

51.304, 51.404 Surveying for Civil and Structural Technology

Application of survey methods to construction surveys, topographic surveys, and hydrographic surveys; triangulation and trilateration; 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; reliability and rejection of observation, calculation of areas, volumes, closure, circular curves, transitional curves, and vertical curves; elementary photogrammetry applied to planning, site surveys, route surveys, grades, and quantities.

51.305, 51.405 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 and plotting of records; computation of closures, areas, and volumes; elementary astronomy, derivation of meridian; elementary photogrammetry applied to mining.

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, siderial 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, properties and gridding; plotting machines.

51.401 *See* 51.301.

51.404 *See* 51.304.

51.405 *See* 51.305.

51.406 *See* 51.306.

51.407 *See* 51.307.

MEDICAL LABORATORY

80.001 General Knowledge and Introduction to the Clinical Laboratory

An introduction to procedures and principles of operation and maintenance of precision instruments and equipment used in the clinical laboratory; laboratory mathematics, genetics, anatomy and physiology, metabolism, organic chemistry, and ethics.

80.002 Histology

The morphology of human cells, tissues, and organs. Emphasis is placed on the preparation of tissues for microscopic examination; methods of fixation, embedding, sectioning, staining, and mounting.

80.003 Medical Bacteriology

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 and culturing methods. An introduction to immunology is included.

80.004 Urinalysis

The study of the structure and physiology of the human excretory system; principles, theories, and procedures of qualitative and quantitative analysis of urine.

80.005 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.

80.006 Blood Banking

The theories of antigen-antibody reactions with detailed study of the important blood-group systems encountered in cross-matching; methods of collection, storage, and precautions employed in blood transfusion services.

80.007 Clinical Chemistry

The study of the structure, properties, reactions, and metabolism of fats, carbohydrates, and proteins; analysis of blood and other body fluids, with emphasis placed on the chemical principles, calculations, and precautions involved.

80.008 Immunology

Serological identification of bacteria and antibodies, with emphasis on the public health aspects. The Department of National Health and Welfare approved methods are employed. Milk and water bacteriology; packaging and shipment of laboratory specimens.

MEDICAL RADIOGRAPHY

81.001 Anatomy and Physiology

Brief outline of embryology; origin and development of the structure of the human body; general summary of human anatomy; origin and meaning

of anatomical terms; surface anatomy and landmarks for radiographic positioning. Special reference is made to the skeletal, muscular, digestive, respiratory, circulatory, urogenital, lymphatic, nervous, and endocrine systems.

81.002 The Physics of Medical Radiography

The elements of electricity and modern physics with an emphasis of those aspects of these topics related to medical radiography. Topics include such matters as the structure of matter, static electricity, d.c. electricity, magnetism and electromagnetic effects, pulsating and alternating currents, X-ray and valve tubes, X-ray circuitry, the production and nature of X-rays, their interaction with matter, dosage and dosimetry, X-ray protection, radioactivity.

81.003 Radiographic Technique

The study of the prime factors in radiographic techniques, technical terms, and conditions influencing the choice of factors. Film identification systems used. The radiographic techniques for individual systems, including radiography of bones, glands, thoracic viscera, abdominal and pelvic viscera, digestive organs, biliary organs, urinary organs, and foreign bodies. Use of mobile radiographic equipment, special techniques for operating-room, pædiatric, soft tissue, high voltage, and contrast media radiography. Techniques for special examinations.

81.004 X-ray Apparatus

Study of the source and distribution of electric-power supply, X-ray transformers and circuitry, the X-ray tube, instruments and controls. Accessory radiographic equipment, including grids, cones, filters, and immobilizing devices. Stereoscopy, spot film devices and special apparatus for body section radiography, image amplification, photofluorography and cineradiography.

81.005 Radiobiology and Protection

The study of ionizing radiation and its biological effects on normal tissues; its local, systemic, and genetic effects.

The study of the maximum permissible radiation exposures to man. The extent of radiation hazards; the source of radiation hazards and means of protection. Radiation monitoring. Electrical hazards.

The basic principles of radiation therapy in medical treatment.

81.006 Related Radiomedical Studies

Consideration of the following subjects with special reference to their relation to medical radiography:

(a) Radiographic Photography

The fundamentals of the photographic process. The physical facilities of the X-ray darkroom. X-ray film and paper, intensifying screens, developers and development, fixers and fixing, rinsing, washing, and drying. Processing equipment. The preparation of photographic solutions, the radiographic image, faults in roentgenograms.

(b) Departmental Administration

Definition of ethics. Relationship with radiologist, fellow technicians, patients, and hospital personnel. Confidential nature of medical informa-

tion. Ownership and medicolegal aspects of handling radiographs. Personal appearance and general deportment.

Instruction in the internal organization of a radiographic department. Handling of requisitions and patient film reports; diagnostic index. Marking, filing, and disposal of films. Procedure for admission of patients. Essentials of a business letter; completion of monthly and annual departmental reports, and general office procedure.

(c) History of Radiography

The history of the development of radiography. The development of radiography and of the radiological technician and technical societies. Explanation and comparison of the profession of medical X-ray technology to the profession of radiology. Orientation of the general conduct of radiological departments and hospitals.

(d) Nursing Essentials

Orientation of the technician to other hospital services; admission of patient, technique of moving, lifting or transferring patient; elementary handling of emergency patients and patient under anæsthesia, preparation of patient for radiographic procedures.

(e) Pathology

The study of the common pathological conditions of the various systems of the human body which are of significance to radiology.

(f) Bacteriology

Outline of bacteriology showing the classifications and properties of microorganisms, with particular reference to common bacteria of medical importance. Means of infection; reaction of the body to infection; natural defences against infection; immunity. Common viral and parasitic infections.

(g) Pharmacology

Definition of pharmaceutical terms and abbreviations; sources of drugs; systems of weights and measures; solutions; preparation of doses and methods of administration of medicine; action of drugs and fundamentals of toxicology.

BUSINESS MANAGEMENT

90.103 Business Mathematics

The fundamentals of financial mathematics, including simple and compound interest, notes, drafts, annuities, sinking funds, and depreciation. Such essentials of retail mathematics as mark-up, mark-down, and stock turnover.

90.131, 90.231 Introduction to Business

An orientation in the terminology and nature of business in the private enterprise system, including consideration of forms of ownership, organization, industrial relations, personnel, marketing, production, control, finance, regulation, and taxation.

90.135, 90.235 Economics

A one-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 purchases and sales transactions, cash and banking procedures, payroll and inventory methods, the accounting for assets, liabilities and capital. Preparation of financial statements and introduction to financial statement analysis. Accounting for proprietorships, partnerships, and limited companies. Departmental and branch accounting, introduction to the preparation of consolidated financial statements.

90.150, 90.250 Data Processing

An introduction to the principles and application of data-processing equipment in business and industry. A study of manual, electric, and electronic machines, including unit record equipment and an introduction to electronic computers.

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.

90.190 Work Study

The application of analytical methods and critical examination in the systematic solution of design and production problems. The techniques of selection, measurement, evaluation, and development preparatory to work improvement.

90.204 Business Statistics

The practical application of statistics to business problems. Includes the collection and presentation of statistical data, frequency distributions, averages, index numbers, probability, theory of games, time series, linear correlations, reliability, and sampling.

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.

90.235 *See* 90.135.

90.240 *See* 90.140.

90.250 *See* 90.150.

90.270 *See* 90.170.

90.296 Systems and Procedures

An introduction to systems and procedures in the office and warehouse. Consideration of practical business applications of major systems such as billing, sales analysis, accounts receivable, and inventory control. Introduction to systems design, data processing, communication systems, and records management.

90.303, 90.403 Mathematical Analysis

A study of mathematical principles and methods having particular relevance to data-processing machines and applications, including number systems, logic, Boolean algebra, linear equations, numerical methods, random numbers, and introduction to calculus.

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.

90.333 Industrial Processes

A special course designed to familiarize students with the principal extractive, process, and manufacturing industries in the Pacific Northwest.

90.341 Cost Accounting

The theory and application of industrial cost accounting. The job cost system and the distribution of labour, materials, and overhead. Process cost accounting in a departmentalized complex, including standard costs, estimated costs, by-product accounting, and other factors. Theory of and procedure in gathering data and the use of data in the analysis, interpretation, and control of operational costs.

90.342 Merchandising and Sales Accounting

Departmental, branch, and agency accounting systems. Consumer credit, instalment sales and consignment sales procedures. Sales factoring and special problems in financing sales. Internal sales control. The retail system of merchandise accounting and various inventory control methods.

90.346 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.

90.350, 90.450 Computer Programming

A detailed study of the organization, method of operation, and capabilities of electronic computers. The student will perform numerous programming exercises and case studies using the I.B.M. 1620 machine. Machine language, symbolic languages, generators, monitors, programming for tape and disk files will be included.

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.

90.360, 90.460 Law and Government Regulations

A study of legal rules and principles which guide decisions involving the law of contracts (including the *Sale of Goods Act*), negotiable instruments (*Bills of Exchange Act*), agency, partnership (*Partnership Act*), company law (B.C. *Companies Act*), and employment.

90.361, 90.461 The Financing of Business

Forms of business; corporate organization; management and control; financing by means of shares or borrowed capital. Management of debt financing; raising of long-term and working capital requirements. Business and banks; surplus, dividend, and reserve policies; forms of business combination; business failures, liquidation, and reorganization; insuring against business risks.

90.371, 90.471 Marketing Institutions

Investigation of marketing agents, wholesalers, retailers, co-operatives, and research agencies, as they relate to the distribution of goods and services. Includes consideration of current developments and trends in both wholesaling and retailing.

90.372, 90.472 Merchandising

Principles of buying and selling and merchandise management; sources of merchandise information and their application, manufacturing, wholesaling and retailing, stock control, location and layout, financing, pricing, buying organizations, techniques of merchandise selection, branding, buying plans and buying controls.

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.

90.375 Salesmanship

Psychology of selling. Qualities of the effective salesman and essential sales traits, practical problems of locating and qualifying buyers, planning sales presentations, securing sales interviews, opening sales presentations, demonstrating, meeting objections, and closing sales.

90.382, 90.482 Office Systems and Equipment

A review of office systems, facilities, and layout. Development of systems, techniques, and methods. An introduction to the functions and operation of commonly used office equipment.

90.396 Data Processing Applications

A study of the application of data-processing principles, including accounting functions, statistical reports, production control, and installation management.

90.403 *See* 90.303.

90.424 Personnel Administration

A sound introduction to the fundamentals of personnel management, including personnel procedures, tools and records, job description, recruiting, interviewing, testing, selection, orientation, training, wage and salary administration, promotion and transfers, benefits, and morale.

90.443 Management Accounting

The operational role of the accountant and his contribution, using accounting as a tool of management. Managerial accounting procedures, preparation of budgets. Administration of the budget programme. Variance analysis and standard costing; break-even analysis. Measuring and reporting performance.

90.445 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.

90.446 Intermediate Accounting

Review of accounting procedures, 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. Statements from incomplete records, reorganization schemes, price level impact on financial statements.

90.450 *See* 90.350.

90.460 *See* 90.360.

90.461 *See* 90.361.

90.471 *See* 90.371.

90.472 *See* 90.372.

90.473 *See* 90.373.

90.474 Market Research

Principles and practices of marketing research, with emphasis on basic methods and techniques, sources and interpretation of data, and presentation of results.

90.482 *See* 90.382.

90.491 Work Study

Detailed study of the processes of selection and critical examination of business, production, and design problems, introduction to work measurement techniques, effects of management controls on productivity, examination of labour's participation in improvement measures and related labour-management relations.

90.496 Advanced Computer Systems

Methods used in the development of business data-processing systems—system specification; equipment appraisal, acquisition, and utilization; implementation and control. These techniques will be applied to the solution of advanced management problems.

BROADCAST COMMUNICATIONS

91.101 Elementary Broadcast Technology (Radio)

An introduction to the equipment used in radio broadcasting and to the techniques used in the various processes and procedures in the operation of radio stations. Starting with the organization of the radio industry and radio stations, the student continues with the study of microphones and turntables, control boards, tape recording, control-room accessories, newsroom equipment and organization, music libraries, live studio pickups, remote broadcasting, and the procedures used in traffic systems and programme schedules.

91.103, 91.203 Writing for Radio

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. Radio commercials are studied in all aspects, and the problems facing radio commercial writers in advertising agencies, radio 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.

91.105 Contemporary History

During the first term, first year, this course will deal with the history of broadcasting, from its inception, through the development of radio and television broadcasting, up to the present day.

Paralleling this will be a lecture series on current events designed to give the student an insight into the world in which he lives, and covering all areas from local, through provincial and national, to international affairs. Also included will be the fields of trade and commerce, religion, medicine, music, art, literature, as well as political and government matters.

This series of lectures will continue throughout the two-year programme.

91.108, 91.208 Law and Government Regulations

A comprehensive study of the regulations governing broadcasting in Canada: B.B.G. regulations, and the laws and regulations concerning radio and television advertising of food and drug products; the Broadcasting Act; the Provincial and Federal Election Acts; requirements of the Department of Transport. The student will also study the law as it pertains to libel, slander, and copyright, and to contracts.

91.110, 91.210 Workshop

From 9 to 10 hours each week is spent in workshop periods, in which the student puts to practical use the theory presented in lecture form. Extensive practical training in control-board operation, tape recording, newsroom operation, remote and studio broadcasting will parallel the lectures in Elementary Broadcast Technology (Radio) in the first term. The same applies to television in the second term, with 10 hours per week devoted to work in the television studio and control rooms on lighting, control operation, camera operation, film and slide projectors, video switching and patching, and video tape recording. Technical Option students will study the testing and maintenance of radio and television equipment of all kinds.

91.111, 91.211 Music for Broadcasting

The course deals with the use of music in radio and television broadcasting; music copyright laws; C.A.P.A.C. and B.M.I.; clearances and recording of music; the organization, filing, and cataloguing of music libraries; the programming of music for tempo, mood, flow, and balance; the control of music programming; the use of music for backgrounds, as production aids, and in commercial production; special effects and sound effects; library and sales aid services.

91.113 Typing

This short course is designed to give the student the necessary competence in touch typing required by programme personnel and newsroom staff. Some emphasis will be placed on format and styles for radio and television script and news materials. The student will make considerable use of typing in assignments during the remainder of the broadcast programme.

91.201 Elementary Broadcast Technology (Television)

The second term of this course is an introduction to the equipment and procedures in television broadcasting. Basic organization is followed by the study of the processes of picture transmission. Lighting and lighting equipment are studied, followed by picture and waveform monitors, applied optics, the vidicon and image orthicon cameras, film and slide projectors, video switcher and patch panels, sync generators, video distribution, video tape recording, and test equipment. This course leads to actual television production throughout the second year.

91.203 *See* 91.103.

91.204, 91.304, 91.404 Speech for Broadcasting

Opening with a study of the principles of communication and the role of the announcer in both radio and television, this course includes work in pronunciation and diction, the use of projection and phrasing, emphasis, stress, and intonation as applied to the work of the disc jockey, commercial announcer, interviewer, newscaster, sportscaster, and narrator. In the second year, emphasis is placed on practical work and individual tuition.

91.205 Contemporary History

This course will start at the conclusion of World War I, with the Treaty of Versailles, and includes study of the following: disarmament, the depression, the rise of the dictatorships and of the National Socialist Party in Germany; the breakdown of the Versailles Treaty; the non-payment of reparations;

Hitler's rise to power; the occupation of Alsace, Austria, and Czechoslovakia; and the invasion of Poland.

91.208 *See* 91.108.

91.210 *See* 91.110.

91.211 *See* 91.111.

91.302, 91.402 Production—Radio

Students engage in practical work in radio production; the preparation and presentation of musical programmes, news broadcasts, remote broadcast, and special events coverage, in all phases of production from planning through to the recording of 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, 91.403 Writing for Television

The more advanced phases of advertising creativity are explored in classroom and workshop sessions, and the television commercial is studied in all its forms. The technical tools available to the television commercial writer—film, video tape, "live action"—are all made completely familiar to the student. Work assignments in advertising agencies, television stations, and other on-the-job TV. writing problems and analysed and compared, and field trips in these occupational areas are included.

91.304 *See* 91.204.

91.305 Contemporary History

World War II; the fall of Poland; the invasion of France; the Battle of Britain; Germany's invasion of Russia; air attacks on Europe; the turning of the tide; American landings in Africa; the Sicillian and Italian campaigns; D-day in Normandy; the Rhine build-up; the Battle of the Bulge and the final collapse of Germany; the final Pacific assaults; the atom bomb in Japan; the rupture with the U.S.S.R.; roots of the Cold War in wartime Big Three conferences; occupation of Berlin; Berlin conflict; Germany as a sovereign state; Korea; Indo-China; Suez; Hungarian Revolution; Lebanon; Algeria; Cuba; Vietnam; De Gaulle and Communist China; and the United Nations.

91.309, 91.409 News for Broadcasting

History of news; newsroom organization and operations in radio and television; news writing and editing; news sources and coverage; production of news broadcasts; news announcing; special interest news programme; news interviewing; editorial in radio and television; news coverage of special events; news in sports and weather; live and filmed coverage of television news.

91.312, 91.412 Production—Television

Students engage in the actual production of television broadcasts, making use of full studio facilities in the production of television news, commercials, special events coverage, the taking and editing of film material, and carrying out on-the-job training projects.

During this course, second year students from the Technical Option work together with students from the Production Option in the development of programme material for video tape recording.

91.315, 91.415 Workshop—Television and Radio

Specialized equipment used in modern television and radio stations is studied in detail, and an advanced level of adjustment and maintenance skills is attained.

Emphasis is placed on the extensive use of sophisticated test equipment with an objective of students reaching a proficiency level such that full attention may be directed to the item being serviced and not on how to use the test equipment. In part of the laboratory time the technical students will combine forces with the production students, and full facilities will be used for programming on an accurately timed and realistic basis.

91.402 *See* 91.302.

91.403 *See* 91.303.

91.404 *See* 91.204.

91.405 Contemporary History

Development of Communist ideology; the Russian Revolution; Karl Marx, Lenin, Trotsky, and Karenski; Russian Civil War; first five-year plan; Stalinist extermination of military leaders; non-aggression pact with Nazi Germany; war with Finland; invasion of Russia by Germany; the Russian war effort; Communist politico-military planning; Communist expansion in Europe; International Communism extending into protracted conflict.

91.409 *See* 91.309.

91.412 *See* 91.312.

91.414 Radio and Television Transmission

This course follows 43.324, Radio Circuits, and takes the student into the theory and practice of the adjustment and maintenance of A.M., F.M., and TV. transmitters. The student is taught the use of both simple and sophisticated equipment used in the testing of all aspects of transmitter operation. He will become familiar with the use of such instruments as the oscilloscope, distortion meter, sideband analyser, video test signal generator, carrier frequency monitor, and other equipment as applied to radio and television transmission.

91.415 *See* 91.315.

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 Beverages

Organization, positions, and duties of catering department staff. Sources, selection, and basic preparations of food; culinary terms, the types, uses, and maintenance of kitchen equipment. Food and beverage purchase and storage. Service of food and beverages in dining-rooms, coffee shops, banquet

rooms, lounges. Grading and specifications. Wines and their origins. Laboratory hours will be devoted to demonstrations, observations, and practical work in the cafeteria kitchen and dining-room.

92.111 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.

92.202 *See* 92.102.

92.203 Housekeeping and Bar 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 and control, glassware, types of beverages, and dispensing devices.

92.302, 92.402 *Food and Beverages*

Management of food and beverage departments—advanced food preparation; food costing; menu planning; special-function catering; convenience and frozen-food processing; purchasing and specifications of equipment; organization and planning, including financial and personnel policies; science of food and nutrition; organization of stewarding department; purchase, storage, and control of china, glass, silver, linen, food, and beverages.

92.312, 92.412 Engineering and Maintenance

Structural maintenance. Electrical, plumbing, and heating systems. Ventilation and air conditioning. Elevator operation and maintenance. Roofs. Fire prevention and protection. Swimming-pools.

92.313, 92.413 Hotel and Restaurant 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. Credit cards, leases, franchises and financing. Insurance and taxation. Uses of data-processing equipment in hotels. Hotel and motel evaluations.

92.314, 92.414 Design and Decoration

Fundamental introduction to blueprint reading. 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. The approach will be made from the point of view of economy and practical requirements.

92.402 *See* 92.302.

92.412 *See* 92.312.

92.413 *See* 92.313.

92.414 *See* 92.314.

92.416 Human Relations

Selection and training of staff—applications, interviews, tests, objectives, methods of training. Job analysis, job descriptions. Thought and leadership. Co-ordination of hotel or restaurant activities with the community. Co-operation with convention bureaux, travel agents, and tourist groups. Labour relations from management and union viewpoints.

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