

Special Electrical
& Electronic
Technology Issue...

BCIT Events to Come

Wednesday, February 2

- Dr. Linda Schele speaks on Maya Cosmos: 3,000 Years on the Shaman's Path. Orpheum Theatre, 1930
- Technology Centre, blood pressure monitor tests, NE25-309, 0930-1730

Friday, February 4

- Technology Centre, blood pressure monitor tests, NE25-309, 0930-1730

Monday, February 7

- Red Cross blood donor clinic, SAC, 1000-1530
- School of Engineering Technology, information session on careers in biotechnology, chemistry, food technology, Administration Building Boardroom, 1830-2030.

Tuesday, February 8

- Red Cross blood donor clinic, SAC, 1000-1530
- Vocational Technical Degree Program discussion with VCC representative, Learning Resources Unit, Room 112A, 1400-1500

February 24-25

- Elite '94 Exploring Alternatives, Burnaby campus

If you would like your event in Update's calendar contact Ronaye Ireland by telephone at 8738, by PROFS RIRELAND or internal mail. Deadline is one week prior to publication.

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

Student Project

Remote sensing technology developed to advance killer whale research



Electronics Engineering Technology students Peter Welk (left) and Iain MacDonald (center) discuss their project with the Vancouver Aquarium's Dr. John Ford.

Much of what we know about killer whales has come from field research done in B.C. And one of the best places to study these mammals is at Robson Bight in Johnstone Strait just south of Alert Bay.

Researchers like world renowned marine mammal scientist John Ford have discovered that killer whales live their lives in family units or pods and communicate with each other through the pod's own distinctive vocal dialect.

Now, thanks to some work by BCIT Electronics Engineering Technology students Peter Welk and Iain Macdonald, researchers may soon be able to listen to these sounds and dialects year round through underwater microphones and cellular phone technology.

The Vancouver Aquarium's Dr. John Ford was looking for some technical help back in September. As an adjunct professor at UBC his first thought was to call up UBC's Electronic Engineering department for help.

"But my colleague John Mair, who is an engineer at CKNW/CFMI said: 'No, no, no, BCIT is the place to go. They have the know how.' I usually listen to John because I have been working with him for 20 years and he is always right."

Dr. Ford called BCIT electronics technology instructor Jim Hayes. It was perfect timing because Jim was at that moment looking for ideas for student projects.

Dr. Ford explained that almost all whale research to date has been done during the summer months. No one really knows what they do between November and April. He wanted to establish an underwater acoustic monitoring station near Robson Bight and to relay the audio signals directly to the aquarium via cellular telephone.

Once at the aquarium, the underwater channel would be monitored by researchers to identify pods and chart their movements. And for the public, the audio signal could be featured in a new exhibit allowing visitors to listen to live killer whale communication.

Students Peter Welk and Iain MacDonald were given six weeks to produce a prototype and a report.

"It was a real technical challenge and these guys pulled it off," said Dr. Ford. "I can't imagine how we could have got to this stage without BCIT where students have the right technical background and are given the direction to get there."

Specifically the students broke the audio signal from the hydrophone down into three frequencies; two related to the whale sounds made in communication and echo location and the third reflected the low hum of engine noise. These sign waves were converted to square waves and analyzed by a micro controller that would determine whether the sounds were valid whale calls. If three valid whale calls were identified within 30 seconds, a Motorola cellular transceiver would dial a number at the aquarium and leave a message on a recording device.

Cellular telephone technology has made all this possible. In the past Dr. Ford experimented with underwater microphones connected to several lighthouses. Whenever the lighthouse keeper heard any interesting sounds he would make a recording. But these days more and more lighthouses are unmanned and automated. With the new technology, scientists can call up the number anytime, anywhere and listen.

Besides the research and conservation benefits of the system, Dr. Ford says he is looking forward to the educational benefits. He says many people will be surprised to realize that this underwater environment is not all pristine and silent, that instead whale communication is hampered by the whine and hum of human sounds.



Killer whales live in family units or pods and communicate through unique dialects.

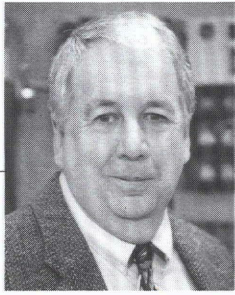
Terry Jorden photos

We've grown up!

Update as you see it here, has grown into a larger, newsier tabloid weekly newspaper. The new format allows for more creative design and layout as well as larger photos, longer stories, letters to the editor and guest columns. This issue is one of many special editions scheduled throughout the year. Watch for our next special edition highlighting BCIT's 30th anniversary in late February. Regular weekly issues of Update will still feature the usual staff news, birthdays, classifieds, birth announcements, staff appointments and gossip. We welcome your comments and hope you enjoy the new publication.

— Update staff

Message from the Dean Dennis Duffey



In January of 1993 the School of Electrical and Electronic Technology was created. Since then I have been asked many times why BCIT created this school?

By creating a tightly focused school within BCIT targeted towards the electrical and electronics industries we've created a centre of excellence that can change and adapt to the market.

Anyone in industry these days knows we are living in a time of rapid technological change. In this industry, keeping up with those changes can make the difference between the survival of your organization or its demise.

Our survival is connected to the relevancy of our training. Keeping in touch with market

changes is proving to be one of my biggest challenges. One way we do that is by creating a series of industry advisory committees for each program.

Another way we keep in touch is through market research. We have created a long-term, on-going business plan based on some first-rate, primary and secondary research. We are looking around the province at existing training needs, our training competitors, technological trends, new delivery methods, even new specific training needs within individual industries.

We remain very excited with the growth of our industry services training. Our goal is to run this service like a business, supporting the purchase of new equipment and materials through revenue generation.

The past year has also been a time of getting our internal house in order. By creating a new school we have spent many hours working on creating an efficient, internal administrative structure.

We are also in the planning stage of creating a new building at the Burnaby Campus that will predominantly house electronics and industrial control programs. The existing Electrical Training Centre is located across the street from the site of the new building. Together the buildings will create a cohesive electrical and electronics community.

Of course we continue to do what we are famous for: pre-employment programs, apprenticeships, certificate and diploma programs, part-time programs, mobile education, and research and development at our Centre for Advanced Industrial Control.

I hope you enjoy this special edition of Update as much as we enjoyed contributing to it.

Update

NEWS BRIEFS

Nechako doc earns TV grad honors

BCIT Broadcast TV grad Steve Hughes and other staffers at CKPG-TV in Prince George received the Golf Ribbon Award at the recent Canadian Association of Broadcasters Convention for their documentary series "The Nechako: A River In Question." Steve was the cameraman/editor on the production. "This is Canada's premier broadcast award and we're proud of the fact that one of our grads played such an integral role in putting together this important program," said School of Business Dean Michael Harrison.

Give blood February 7-8

The Red Cross will hold a blood donor clinic in the lobby of the SAC SE16 on February 7-8 between 1000 and 1530. Don't forget to bring some identification with you. You are also advised to eat something at least four hours before donating blood.

New purchasing manager

Sheila Garner is the new manager of Purchasing. Sheila is a certified professional purchaser who's career background includes several years in the health care field and most recently as the purchasing manager at the Vancouver General Hospital.



Sheila Garner

Residence advisors needed

Maquinna Residence is looking for residence advisors for 1994-95. Advisors are mature, resourceful students, faculty, staff or alumni, who live in residence and assist in the residential community. They live in rent-free private apartments and act as leaders in individual houses. Applications are invited

from singles and couples but because of a lack of facilities, applicants with children can not be considered. Application deadline is Friday, February 25. For more information call 432-8606.

BCIT invited to Pasta Power

Students and faculty are invited to engage in the Spaghetti Bridge Building Contest, February 11 at the KLO Campus of Okanagan University College. The last two years the winning heavy weight bridge was built by Bob Williams of Lumby. A world record was set in 1993 when his bridge held 176 kilograms. Call Terry Jorden at 8656 for more information.

Runners and walkers sought

If you are planning to run or walk in the 10th Annual Vancouver Sun Fun Run on April 17 Electronics Instructor Ian Ross wants to hear from you. Last year BCIT fielded a team of about 20 runners with Tony Barren posting the fastest time. Call Ian at 8374 for more details and a training schedule.

I Didn't Know That

UBC Professor Michael Smith, the co-recipient of the 1993 Nobel Prize for Chemistry, was active in the development of the Biotechnology Program and served as a member of the program advisory committee from 1989-93.

Kudos for two marketing grads

Michael Drever and Annette O'Shea-Roche, both graduates of Marketing Management in 1986, have been singled out by *Business In Vancouver* as two of the city's top 40 business people under the age of 40.

Vocational Technical degree discussion February 8

An information session on the Vocational Technical Degree Program will be lead by a Vancouver Community College representative on February 8. The representative will give an update on the vocational technical degree program available between VCC and the University of Alberta. It will be held in room 112A in the Learning Resources Unit between 1400-1500.

Letters to the Editor

The good ship BCIT...

I think your picture of the future with the good ship BCIT (Update January 10) is really great. It's so much more fun to imagine all these things happening as our ship goes on its journey. Hope you stay with the new publication.

Lynne Larsson
Entrepreneurial Centre

Buenos Dias!

I am pleased to include this newsletter in my Documentation Area. This material will surely enrich our collection of publications and it will undoubtedly benefit our community. I look forward to

receiving this excellent material periodically and I thank you for having our institution included on your mailing list.

Lic. Baldemar Rubio Ruelas
Centro de Ciencias de Sinaloa
Mexico

Distance Ed works

Like BCIT, Universal Career Institute offers distance education courses in several different areas. The courses are designed to be completed within one to two years. The average completion time for one assignment is 15-20 hours. My particular program, Animal Care Specialists, consisted of several different modules from radiology and pharmacology to business transactions and

livestock handling. A diploma is awarded to students who achieve 70 percent or higher or our honours diploma with 90 percent or more which is what I received. I have found distance education to be of tremendous value in achieving my education goals as I continue to pursue various BCIT nursing courses.

Jane Gale
Part-time technician
School of Health Science

Note from the editor

We encourage Letters to the Editor as well as guest editorials. We want your viewpoints, opinions and gripes. Your thoughts are important to us. We reserve the right to edit for brevity, accuracy and libel.

Editor



(from left) Bruce Kenneth Forbes, CEO of Archibus Inc., was at the Burnaby Campus January 21 to officially donate \$120,000 US for a site licence for an AutoCAD based integrated facilities management software. Frank Gruen, Lorna Shapiro and Nick Springate look on. The licence allows 31 workstations to use the Archibus/FM software in courses in the Business Certificate Program in Facilities Management.

Bert Schendel photo

The BCIT UPDATE is published weekly throughout the school year by the Information and Community Relations Department within Marketing and Development.

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Managing Editor: Carol Dion, 432-8865

Editor: Terry Jorden, 432-8656

Design: Admedia Graphic Communication Inc.

Production: Ronaye Ireland, 432-8738
Mary Murray

Fax: 436-5762

Electrical and Electronic Technology

BCIT leads national articulation of electronics common core program

A few years ago the Ministry of Advanced Education, Training and Technology initiated a project to standardize a pre-employment electronics technician program.

The idea was to create an eight-month, full-time program to provide a basic foundation on which to support more specialized programs.

This Electronics Technician Common Core program, as it is known, is taught at BCIT and selected community colleges around the province. The provincial articulation went so well, the wheels are turning to establish a national system.

Enrolment has doubled every year since 1989 when the program was first offered.

The program is a real bonus for students who can take the common core program from the University College of the Cariboo, VCC, North Island College or Malaspina College and transfer easily to BCIT for specialization.

Patrick Muldoon, chief instructor of the Electronics Technician program, said he is now getting inquiries from the United States about the common core program.

"Part of the reason for our success is because of the structure. It is based on a military type system not a classic academic system," said Muldoon. "All we do is one thing at a time until it is done. For example, when we are doing transistors, all we do is transistors for three weeks which allows the student to focus on one subject completely."

Once students complete the common core program, many move on to electronic specialities like avionics, electrical control service technician, industrial instrumentation service technician, automated business equipment and telecommunications technician.



Muldoon says the only factors standing in the way of future enrolment growth is classroom space. The program is now offered at the Burnaby, Sea Island and Langley campuses.

"We are training students to install, maintain and repair various electronic equipment and right now there is big demand for just that," he said.

Patrick Muldoon: "All we do is one thing at a time until it is done."

Terry Jorden photo

School of E and E pioneers computer-based learning packages

Getting its start from a Federal Innovations grant in 1986, the Industry Services Division of the School of Electrical and Electronic Technology has developed a series of ground-breaking, computer-based learning packages.

Traditional computer-based learning are simple electronic page-turners which print text on the screen and give students drill-type exercises. But they do not interact with students in a significant way. Perhaps the best model for what computer-based learning packages should be like are so-called adventure games, which feature extensive graphics, sound, and user interaction with intelligent feedback.

What many people do not realize is that adventure games typically require 20 to 30 person-years of programming time. An investment of 20 to 30 person-years is acceptable for an adventure game because such games often have millions of users world-wide.

Working with the Technology Centre and Pacific Artificial Intelligence Corp., a local software development company, we have pioneered software that has the capability to produce commercial grade applications with all the bells and whistles (sound, animation, powerful graphics, etc.).

Compared to traditional development environments, this software allows commercial applications to be generated far more rapidly, and therefore with greatly reduced labour costs. This is essential, given that the specialized computer-based training aids being created for industry services will not have the millions of users which computer adventure games enjoy. So we have to do the work quickly, and get it in the field while the opportunity is there.

Even with the best tools creating computer-based tutors is still tough work. In deciding what tutors to create, we have always listened carefully to our Industry Services customers.

For example, when BC Hydro indicated that they would like a training program for their electricians in Mica Creek on Programmable Logic Controllers, we saw an opportunity to extend our computer-based training and give it a clear industrial focus.

A Programmable Logic Controller is an industrialized computer widely used today instead of electromechanical control systems. Working with the electrical crew, we selected a sump pump which was being controlled electromechanically and developed a computer simulation of the sump pump. This allowed us to provide realistic training in industrial control using simulation technology rather than expensive physical hardware.

Simulation plays a key part in all of computer-based training being developed for industry services. Recently, we created a simulation of the MS DOS operating system to be used in our industrial computer literacy training. We found that workers doing industrial programming need a much greater depth of understanding of the operating system than office workers, for example.

A mistake made in industry always has the potential of life threatening consequences. By allowing workers to do DOS programming in a simulation of the operating system rather than the real operating system, we are able to shelter the host hardware from any destructive consequences of programming errors. We are also able to provide much better system feedback, compared to the notorious and cryptic error messages of MS DOS.

To support the Programmable Logic Controller training and a number of other high technology programs, we have developed a computer-based training package which teaches students basic computer mathematics. We found that students were having a great deal of trouble with arithmetic using bases other than ten.

Computers work primarily in base two and base 16. To program effectively, students must have at least a basic understanding of the way a computer does mathematics. So a computer-based tutor was developed to overcome the learning difficulties students were experiencing with the new math.

This computer-based math tutor was demonstrated to Duncan MacRae, director of colleges and technical programs branch, Ministry of Skills, Training and Labour. Mr. MacRae praised the tutor highly, and commented that it should be used to provide math instruction in the electrical apprenticeship program.

This tutor makes very strong use of graphics and adopts a visual approach to teaching mathematics. Work is actively underway to generalize the tutor, so that it can be used to support the electrical apprenticeship program.

submitted by Jeff Skosnik,
program head,
Industry Services.

Employees Support Marketing of Logic Analyzer

Mike Jervis, Trevor Glave and Jan Borge, together with private businessman Bill Tracey, have formed Borge Instruments Ltd., a sales company, to determine if the Borge Logic Analyzer can be sold in the Lower Mainland marketplace.

The Borge Logic Analyzer was developed by 1992 Electronics Engineering Technology graduates Jan Borge and Paul Vallee with support from the BCIT Technology Centre. It is a device that is useful for testing electronic hardware and software. The technology is currently owned by BCIT.

The technology used by Jan and Paul is highly innovative, and allows the device to be produced at about a quarter of the cost of a commercial unit. That has made it cheap enough for BCIT to build 32 of the devices which are being used by Electronics Technology students in their program.

The principals of the new company decided on their own initiative to evaluate whether a market exists for the instrument. If the market potential is confirmed they will negotiate with Technology Centre Director Norman Streat for purchase of the technology.

It has been a steady progression for 25-year old Jan. It started out as a student project with industry partner Hamilton Avnet. Afterwards he was hired by BCIT's Technology Centre as a Research Assistant and he participated in the Venture Program, BCIT's program for training entrepreneurs.

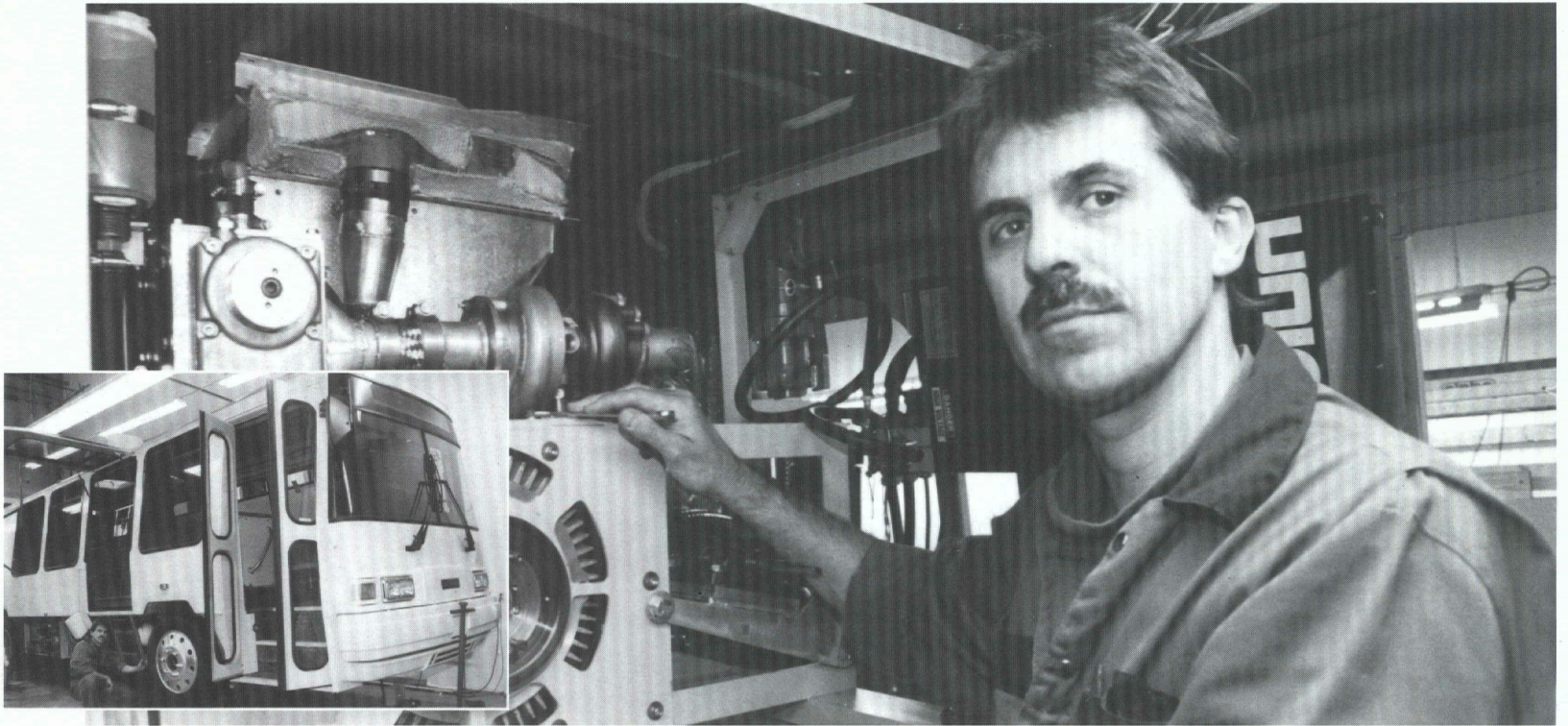


Computer-based learning was used recently at the Mica Creek hydro facility.

Jeff Skosnik photo

Glen Morgan, graduated from UBC but couldn't find a job so he went to BCIT.

Over two co-op work terms he worked on Ballard's zero emission bus.
Bert Schendel photos



Co-op work term

Morgan participates in ground-breaking fuel cell development

Ballard Power Systems of North Vancouver has developed a revolutionary alternative to the internal combustion engine: a hydrogen fuel cell that produces electric power with pure water as its only byproduct. Ballard is now building the world's first zero-emission vehicle, a fuel-cell powered B.C. Transit bus.

Science Applications International Corporation (SAIC) is a North Shore company working closely with Ballard on the bus project. Electronics Engineering Technology graduate Glen Morgan spent two co-op work terms during his two-year program in Automation and Instrumentation working at SAIC on an important component of the fuel cell-powered bus project.

During his first term at SAIC, Morgan worked on smaller projects, developing small circuit boards and doing field wiring. But during his second term, in the Fall of 1992, he helped design the circuit board which monitors each fuel cell and relays the signal back to a master controller.

The bus is powered by not one but over a thousand fuel cells arranged in stacks of 50 fuel cells in a series. The fuel cells are powered by hydrogen and oxygen. According to Morgan, hydrogen is a very volatile substance, so each fuel cell has to be monitored to ensure safe operation of the entire system.

The circuit board Morgan worked on, the TVP or Temperature Voltage Peripheral, sits on top of each fuel cell stack and picks up temperature and voltage signals from each fuel cell, and also picks up total stack voltage. As part of his co-op project, Morgan designed the interface to the board, the analog circuitry to pick up all the signals, and the microcontroller to store this information to the main computer.

"It's a data acquisition field unit," said Morgan. The system not only provides for the safe operation of the fuel cell power system, but also provides data on how the system performs under varying conditions.

Morgan recently completed the Engineering Technology two-year Instrumentation and Automation program and is very pleased with his prospects upon graduation. He has several job offers, and may continue working on the Ballard fuel cell project. Morgan holds a Physics degree as well as his BCIT diploma, but after graduating from university, he wasn't able to get a job in his field. Now, with practical technical training and experience under his belt, he has a number of choices and a bright future in his chosen career.

Mike Jervis helps make the connection for interactive TV show on B.C. coast

Mike Jervis, the associate dean of the Electronic Engineering Technology department, has played a key role in getting the Canadian Coastal Safari on the air.

This April, the live and interactive television adventure, Canadian Coastal Safari, journeys to the Broken Islands of Barkley Sound and brings to students around the world a chance to experience the unique ocean environment of B.C.

Broadcast live from a number of island locations, the Canadian Coastal Safari will feature coastal history and ecology.

Mike Jervis has been working with BC Tel, Canadian cablevision companies, and other companies in the broadcast and communications industry to organize the microwave and network facilities necessary for this interactive television event.

"We will have mobile production on the Canadian Survey ship *John P. Tully*, a scientific research vessel donated for the project by the Institute of Ocean Sciences," said Mike Jervis.

Another production site will be located on a barge stationed in the Broken Islands over the wreck of the *Thiepval*. There divers will explore the wreckage and the numerous habitat sites that provide varied settings for marine life.

"The really exciting part of this project is that it is interactive and thanks to the out-standing support offered by BC Tel and the cable television industry, students from across Canada will be able to appear on the television program and ask questions of the scientists in the field. This will be an exciting and participatory program — The Olympic Games of Science," said Jervis.

The program will look at the magnificent humpback and gray whales, shy black bears, ghost-like skates, majestic bald eagles, sleek six-gilled sharks, indian villages, rugged west coast terrain, and sunken vessels.

The program airs Monday, April 18 to Saturday, April 23, in four one-hour shows per day on the Knowledge Network and selected cable channels around the country.

Julie Van Buskirk: industrial instrumentation instructor

When Julie Van Buskirk first went to college she took an aptitude course that told her she'd make a great carpenter or a mechanic.

She should have listened. Instead she became a secretary.

A few years later, she found herself as an apprentice instrument mechanic in the Fletcher Challenge pulp mill in Mackenzie. More recently for the past four and a half years she has been a BCIT industrial instrumentation instructor.

"You're never bored here," she said. "There is always something to do. You can always get better. I certainly know my trade a lot better than when I worked in a pulp mill."

Today she is one of the hundreds of BCIT instructors and faculty who bring years of industry experience to the classroom, the lab or shop.

She and instructor Rob Evans team teach industrial instrumentation apprentices who come to BCIT eight weeks a year over five years. These apprentices are sponsored by employers operating in industries like pulp and paper, mining, gas and oil.

Julie says a big part of her job satisfaction comes when she can light a spark in her students or reassure those who have been away from the classroom for a few years.

"I get a kick out of helping people learn how to fix things. Watching them say 'Oh wow, I fixed that.'" she said.

Julie started her apprenticeship back in 1976 at the Fletcher Challenge Mackenzie pulp mill. Not including the office staff, she was the only woman out of 100 unionized millworkers.

Competition was stiff for the apprenticeship but she was selected.

"I just applied to see if I could get it. I figured if you are going to work for a living, you may as well get paid as well as possible doing something that is really challenging," she said.

Married, and a mother of six, she knows the challenges of balancing family and work but she says her priorities are clear.



Julie Van Buskirk: industrial instrumentation instructor

Terry Jorden photo

"Being there for my family is number one. Number two is my job and I enjoy it. I get extremely bored when I am not working. By the end of the summer I am ready to come back to work," she said.

She's a little surprised more people don't consider careers in trades. She thinks part of the reason is linked to the way the industrial arts are introduced in high school.

"At the high school level there is not enough exposure to the trades yet. All grade eights must take woodwork, metalwork, cooking and sewing. I think that is marvellous but in so many cases it is too academic. Students don't realize that the trades are a great way to make a living."

Even among her own children, it's hard to convince them to consider the trades.

"My 17-year-old wants to teach high school. She is very good in sciences and French," Julie said. "But my younger girl says one day she wants to be an electrician like her daddy or an instrument mechanic like her mom. But she's only nine years old."

Julie figures there's only one way to draw new people to the trades. "Publish the annual salaries."



Post-secondary educators from around B.C. and Alberta gathered at BCIT December 14-17 for a four-day provincial training session on the use of Cooperative Learning, a structured approach that helps students work together more effectively. BCIT participants included George Jones from Welding (back row left), Tom Nelson, Small Engines (not present) and Clarence Heppner, Auto Repair and Refinishing (back row, third from left).

Industry Services

Going the extra mile

The Industry Services Division of the School of Electrical and Electronic Technology offers customized, on-site training directly to industry.

For the past few years there has been substantial growth in Industry Services. Market research indicates that most new training opportunities will be in part-time studies and Industry Services. But to develop specialized training programs for off-campus delivery presents many challenges to the Industry Services Division.

It is important to be able to act swiftly and decisively, despite having only partial information and indefinite leads to follow. Industry offerings have grown

Computer networking, Distributed Control Systems, electromechanical interfacing, PACE soldiering, fibre optics, and Programmable Logic Controllers — are just a few of the areas where Industry Services is delivering customized training programs to meet the site specific training needs of industry.

New trends are sending Industry Services in new directions. As industrial operations become more computerized, it becomes increasingly important to address some basic issues of computer literacy, reading comprehension for technical documentation, and system level troubleshooting.

is bringing a second trailer on-line, one devoted to computerized electromechanical systems. This trailer will support hands-on training with groups working together and drawn from different trades. Third and fourth trailers will also be coming on-line, the third devoted to electronics and the fourth to computer-based learning.

Other new training opportunities opening up as a result of computerization of industrial operations include advanced computer-based troubleshooting systems. For an Industry Services program running in Prince Rupert this winter, students from the electrical and mechanical trades are developing a computer-based expert system program for troubleshooting the hydraulic drives in a local mill.

As part of this same training program, students are also writing a computer program for calculating cooking times for salmon at a local cannery. The details of this program were worked out in cooperation with the equipment operators and the maintenance personnel. What we are seeing is that computerization of industrial processes always draw together workers who formerly needed a much narrower vision of their job in relation to the work of others at the same plant.

This situation creates some training opportunities for BCIT improving the communications skills of workers who must now function effectively on problem solving teams which concentrate on troubleshooting a system rather than a set of electrical or mechanical components. The new training does not equip mechanical workers to do electrical work, or electrical workers to do mechanical work; it simply helps the trades to work together.



Jeff Skosnik (right) works with industrial students who are writing a computer program for calculating salmon cooking times for a Prince Rupert cannery.

to a point that they now support the full-time operation of a 40-foot high-tech training trailer, which tours the province and provides advanced hands-on training in industrial computing and other subjects.

Floyd Lundstrom, electrical/instrument superintendent for Fletcher Challenge (Crofton), described the programs delivered out of the trailer as excellent.

"The trailer was well equipped, roomy, and solved my problems of finding a training site at the mill for two weeks," he said.

Although upgrading has always been a part of a trade-person's life, changing technology has placed new demands upon the worker for skills upgrading. Also, computerized control integrates components into one system with electrical and mechanical subsystems. Troubleshooting such a system requires a knowledge of computers, as well as some background knowledge in both electrical and mechanical systems.

This has the effect of blurring traditional trade lines, to some extent. To address a whole new group of training needs BCIT

BCIT a prime source of electrical contractors

The Electrical Contractors Association (ECA) of B.C. is one of many industry trade groups that maintains close ties with BCIT, which has earned a reputation for excellent practical training and graduates that are truly prepared for their jobs.

"BCIT is extremely important to the electrical contracting industry," according to Clifford Pilkey, Executive Director of the Electrical Contractors Association of B.C. "The school provides good training, and good instructors, in most cases previous journeymen themselves."

Pilkey, who is a member of BCIT's Electrical Electronics Advisory Committee notes that the ECA has a long-standing relationship with BCIT because

his association has "always been very satisfied with the methods of instruction, and equipment available to train people on ... they always graduate good apprentices."

ECA also works with BCIT to provide its internal training and upgrading to Lower Mainland



ECA's Cliff Pilkey

area members. Founded in 1951, ECA has 300 corporate members throughout B.C., many of whom have BCIT to thank for at least some of their electrical expertise.

Electrical apprenticeships nearly double in past seven years

The numbers of apprentices in BCIT electrical programs has grown from about 12 classes a year to 20 classes this year.

Following industry pressure, the length of the program was increased from eight to 10 weeks a year.

This year, over 1,300 apprentices will attend their 10-week-long technical training sessions held mostly at the Burnaby campus. Because of increased demand in the Fraser Valley, BCIT has formed a partnership with Langley Secondary School to offer one apprenticeship class this year.

"It's hard to determine the exact cause of this increase but generally I think increased industry demand for skilled workers has contributed to our rising enrolment," said Juri Lilleniit, chief instructor, Electrical Apprenticeship Programs.

Lilleniit said his department has been instrumental in

assisting the Ministry of Skills, Training and Labour to develop a new course outline and a formal student learning guide.

"All we had before was a course outline. Now with these student learning guides we have a provincial curriculum that will remain consistent no matter who or where it is taught," he said.

Another recent improvement has been the acquisition of new equipment including adjustable speed electronic motor drives and programmable logic controllers.

BCIT continues to offer the more specialized motor winding apprentice program, the only one of its kind in the province and probably the finest equipped in Canada. Following the electrical program, the motor winding apprentice program also has upgraded its course outline.

V-Tech a haven for Engineering Technology grads

V-Tech Engineering Canada is the Richmond-based research and development arm of the Video Technology Group, the largest electronics manufacturer in Hong Kong.

V-Tech manufactures a wide range of consumer electronic products from computers and cordless phone to toys. One of the reasons the multinational firm decided to do research and development in B.C. was the availability of talented and dedicated people in this province.

Many of those people are BCIT graduates. V-Tech Engineering consists of a computer division and a telecommunications division. Of the 20 full-time employees in telecommunications seven are Electronics Engineering Technology graduates, and several more BCIT alumni work in the computer division.



▲ BCIT grads Gordon Ryley (left) and Gary Rogalski on the job at V-Tech.

◀ Other BCIT grads at V-Tech include Russ Fretenburg, Ralph Rischler, John Tani, Glenda Wilson, Gary Rogalski, Len Wubs and Gord Ryley.

Mike Gdowski photos

Gordon Ryley, who is a senior engineer for the telecommunications division, is currently working on the software for a German 900 MHz cordless telephone. V-Tech is the first company in the world to develop a 900 MHz digital cordless phone for the consumer market. Ryley took broadcast communications and then control electronics at BCIT. He feels the institute did a good job in preparing him for the work he's now doing, and he adds that he landed a job within a month of graduation.

Gary Rogalski, project manager for the US 900 MHz phone group at V-Tech, is a graduate of the Engineering Technology telecommunications program. "BCIT prepared us very well," said Rogalski. "It provides a very good combination of theoretical and practical experience, and a strong foundation for picking up what's applicable on the job."

From Electronics Instructor

Stephen Hawking answers tough question

Last summer world renowned mathematician Stephen Hawking gave a lecture to a large audience at the Orpheum Theatre. In an open question period, BCIT electronics instructor Miro Angeles rose and asked Hawking a question about the existence of matter.

It was a tough question and Miro was told that Professor Hawking would consider the question and "get back to him." On January 14 a letter arrived from the University of Cambridge, England containing Hawking's personal response.

First, here is Miro's question:

"Other than Rene DesCartes' dictum: 'I think, therefore I am,' all the sciences, as well as Judeo-Christian traditions, seem to revolve around one paradigm; 'the existence of matter.'"

It appears that in order to have a universe, two monumental acts of creation must take place:

- 1) Matter has to be created, either by the action of a Deity or as the result of what you (and Alan Guth) call 'the ultimate free lunch.'
- 2) Physical laws must be created in order to govern its behaviour. This has been the task of our

leading minds, e.g. Galileo, Newton, Heisenberg, Einstein, Penrose and yourself.

As a citizen of the universe, the only proof I have of its existence is my personal experience. Is there any other way to prove it is there?"

Here is Hawking's reply:

"If the no boundary proposal that Jim Hartle and I put forward is correct, spacetime has no beginning or end, at least in the imaginary direction of time. It is a closed surface like the surface of the Earth. One cannot talk of matter or physical laws being created: they just are."

Electronics Engineering Technology - Enrolment is up!

Interest in the Electronics Engineering Technology program is on the rise as the industry moves into a solid growth phase.

Electronics Engineering Technology (EET) is using two intakes of students each year to try to satisfy the high demand for seats. EET is currently enrolling 270 students per year into Level 1.

Approximately 25 students per year are admitted to the program with advance standing. These students enter into Level 2 or 3. The flexibility of course-by-course registration makes this possible.

Our graduates are very successful in finding employment

Loren Boyle, first year program head, says he works with the students to arrange a program of studies that best meets with their own personal situations.

Electronics Engineering Technology graduates 150 students per year in four specialities: Computer Control Technology, Electrical Power Technology, Automation and Instrumentation Technology, and Telecommunications Technology.

"Our graduates are very successful in finding employment in their chosen electronics speciality," said Loren Boyle.

The service sector has continued to be a constant source of jobs but the real growth has been in the export oriented manufacturing sector. The emergence of B.C.'s information technology has provided many new jobs for graduates.

Langley campus

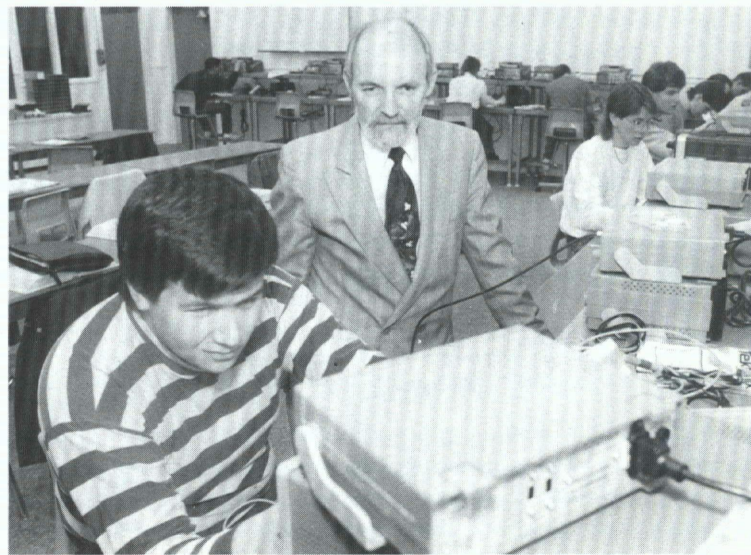
Fraser Valley growth spurs BCIT to open Langley facility

Enrolments for electrical and electronics courses have always been strong from communities around the Fraser Valley and in the last few years BCIT has moved to serve those students better.

Since 1990 BCIT has offered programs in Langley but it was in September of 1991 that a deal was worked out with Langley Secondary School to renovate an automotive shop into two classrooms and begin offering BCIT programs in a high school setting.

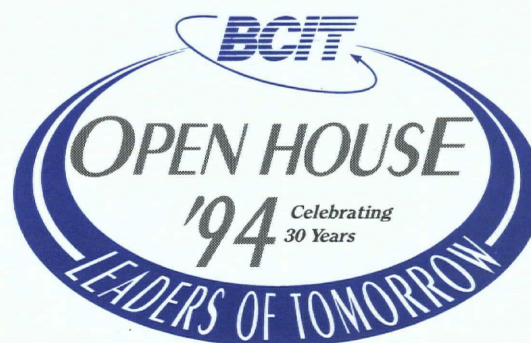
It has turned out to be a win-win situation. The BCIT electrical and electronics students travel less distance to attend classes and the high school students get a taste of post-secondary education.

Programs currently offered include the Electronics Technician Common Core, the Industrial Electricity and Electronics and the first year of the Electrical Apprentice.



Langley Secondary School principal Dan Pebbles checks out the BCIT labs in his school.

Terry Jorden photo



Mechanical Industries Training

Another major automaker training partnership signed



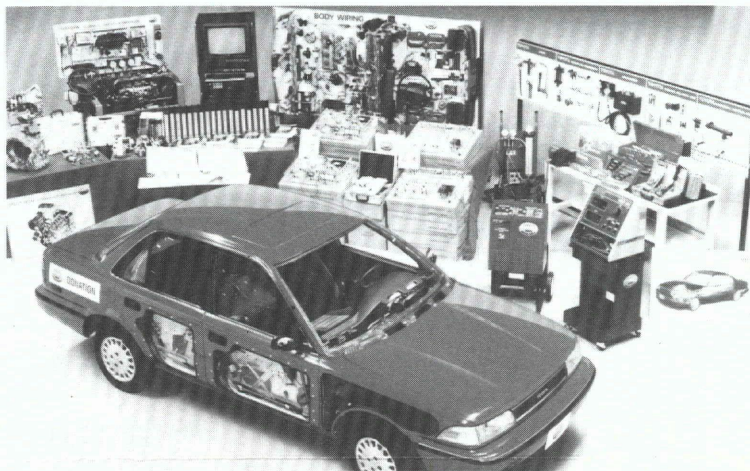
BCIT President John Watson and Toyota Canada President Toshio Kunii check out the new cut-away Toyota among automotive students.

Bert Schendel photo

BCIT automotive students and instructors will now have access to the latest automotive technology and training techniques thanks to a new partnership agreement with Toyota Canada Inc. signed on January 19.

BCIT joins three other Canadian post-secondary institutions in the delivery of the Toyota Technical Education Program (T-TEP).

Toshio Kunii, president of Toyota Canada Inc., said his company will donate a comprehensive package of automotive technician training materials, three automobiles including a cutaway version of a Toyota Corolla, plus funds to build a new facility at the Burnaby campus. Toyota is also committed to the upgrading of the training materials to be current with future automotive technology. In addition BCIT instructors will receive factory training from Toyota Canada.



T-TEP was officially signed January 19.

"Often training is a few years behind the industry, but not in this case," said Ron Evans, the associate dean of Mechanical Industries Training. "In this program, we'll be training students on current technology, so when they're on the job, they'll be familiar with the latest models."

"This partnership gives us first-hand access to the latest in Toyota vehicles and product information, as well as the special tooling," he said.

The T-TEP training package consists of both practical and theoretical components representing the industry's most up-to-date technology.

BCIT team hopes new design will cement victory in famous concrete toboggan race

If they build it, will it run?

And will their sled be fast enough to win the Great Northern Concrete Toboggan Race later this month?

"Last year we had a really good design," boasts engineering student Don Svensrud, captain of BCIT's 11-member toboggan team. "But we ran into complications — not getting enough speed.

"Usually the idea is to use sleigh runners or just have a concrete slab. This year we're going with a combination of both."

It will have to be good to top the competition. Held in Edmonton over the past weekend the race features about 60 teams of engineering students from nearly 30 universities and technical schools in North America and Europe. Results were not available for press time.

As an engineering challenge, it's a tough one. The pay-off: glory — prize money won't even pay for the \$400 worth of materials used.

Only concrete can touch the snow, so toboggan aerodynamics are crucial to a good run, where speeds reach 50 kilometres an hour. A maximum weight of 136 kilograms puts emphasis on design rather than mass.

In earlier races there was no weight limit, and since heavier sleds are often faster some toboggans were dangerously heavy.

Toboggans are judged on speed, design and — ahem — beauty, if bullet-shaped blobs on concrete can be called beautiful.

Originally from mild-wintered Victoria, Svensrud, 24, didn't have much experience

with toboggans, concrete or otherwise, until this project. But he knows the material can be fragile, and that's enough to rule out a test run. "What if it breaks."

Already the students have put in hundreds of hours of their own time — it's not part of their class work — designing and building the sled. Pre-race fine-tuning

continues, so they haven't yet seen the last of Svensrud's Surrey garage that's served as workshop and team headquarters.

Sponsors have donated much of the materials, and the team is relying on donors such as the BCIT alumni association and others for the estimated \$6,500 travel expenses.

Whatever the results, just designing the toboggan is invaluable experience, he says.

"And it's a great chance to see what other students are doing in engineering."

from Stephen Barrington, Media Relations

What if it breaks ?

Voice Mail Hot Tips

In your voice mail greeting, you are required to inform the caller to **press 0 for assistance**. If your current greeting does not contain this, please re-record your greeting.

While listening to a message:

- Press 3 to fast-forward 10 seconds
- Press 33 to fast-forward to the end
- Press 4 to play the message slower
- Press 8 for normal volume
- Press 9 for louder volume

from Gloria Mattie

Automation and Instrumentation student Rob Sanford also happens to work at Whistler Mountain. Rob worked with assistant Electronics instructor Jeff Maidens to develop an improved operator/plc interface for the ski hill's green chair.



Australians taken by surprise in indoor futsal soccer game

A touring Australian under 19 select team fell to a 4-3 loss to the BCIT Cougars men's soccer team in an indoor futsal soccer game January 21 at BCIT.

"We took them by surprise because we scored two goals in the first minute," said BCIT coach Alan Ross. "We took a 3-0 lead before the Australians got on the scoreboard."

By halftime the score was 4-3 and BCIT was able to play a strong defensive game to capture the win.

"It was touch and go. The Australians came on strong in the second half and put on lots of pressure but we were able to hang on," said Ross.



The winning BCIT Cougars: (back row from left) Colin Alden, Greg Drazenovic, Dennis Crajak, Ken Campbell and Jasek Hajdecki. (Front row from left) George Drazenovic, Cam Armstrong, Chris Brizca and Eric Tossauainen. (Missing) Colin Thomas and Frank Giallonardo.

This past weekend the BCIT Cougars travelled to Nanaimo's Malaspina College to play two games in a Futsal tournament with other collegiate teams. Results were not available at press time.

The Cougars play in an inter-collegiate league with Cariboo University College, Okanagan University College, Malaspina College, Capilano College, Douglas College and Trinity Western.

Leaders of Tomorrow, this year's theme for Open House '94 Celebrations



Thousands of people are expected to take in the sights and sounds of Open House '94 April 8-9 at the Burnaby Campus.

Every two years the Burnaby Campus opens its doors to thousands of guests. This year April 8-9 are the days to mark on your calendar to attend BCIT's "Leaders of Tomorrow" Open House '94 celebrations.

Over 100 student displays, children's activities, logger sports, jugglers, clowns, musicians, a mural contest, an Imagination Market and a career fair with business and industry representatives will be a few of the features at Open House '94, an event organized by our students.

"One of this year's highlights is going to be Marsville, a series of martian landscapes made by elementary students placed in large plastic bubbles and

displayed in the gym," said Dia Richardson, student coordinator of External Promotions.

The official opening ceremonies will take place on Friday, April 8 in the campus square. Besides speeches from dignitaries during the ceremonies, the official ground breaking for the long awaited construction of the new Student Centre will take place.

While Open House '94 will be a lot of fun it also promises to be very useful. For those interested in starting a career this is an excellent opportunity to see what BCIT is all about. You can meet the instructors and students and see the equipment and facilities. Attending Open House gives you the kind of information about career choices that a course calendar just can't do.

The day before the opening ceremonies, a career fair will be held in the Town Square Conference Centre, with dozens of representatives from business, government and industry.

For employers, open house provides a first-hand look at what students are learning. For families, open house will be economical, fun and educational.

To offset the cost of holding open house, students have organized fundraising activities for the coming months. Some of those include corporate sponsorships, advertising, car washes, dances and a murder mystery.

Part-time course offerings for the Spring of 1994

Here's a preview of our Electrical and Electronic Technology spring part-time courses. Keep an eye out for the regular BCIT part-time spring flyer in March for more detailed course and registration information. For more information call 432-8637.

ELECTRICAL TRADES UPGRADING

The following courses are designed for persons who are working in the Electrical Trade.

Electrical trade qualification refresher	\$520
Electrical Code 1	\$402
Electrical Code 2	\$402
Code calculations for motors	\$60
Code calculations for transformers and capacitors	\$60
Code requirements for grounding and bonding	\$60
Code requirements for protection and control	\$60
Math for electricians 1	\$433
Math for electricians 2	\$433
Math for electricians 3	\$433
DC motors	\$110
AC motors	\$110
AC systems, transformers and distributions	\$110
Lighting	\$110
Heating, ventilating, air conditioning systems	\$110
Electrical blueprint reading	\$110
Fire alarm systems	\$110
Security systems	\$329
Basic hydraulics for electrical	\$207
High voltage 1	\$233
High voltage 2	\$294

ELECTRONICS TRADES

Surface mount technology	\$895
Electronics: passive devices	\$504
Electronics: solid state devices	\$543
Electronics: digital devices	\$543

Electronics: microprocessors	\$644
Microcomputer systems maintenance	\$554
Fibre optics	\$995

INDUSTRIAL COMPUTING AND CONTROL

Introduction to computers for electricians	\$214
Programming in basic for tradespersons	\$306
Intro to L.A.N. systems	\$360
Intro to Novell network V3.11	\$360
DC variable speed drives	\$110
AC variable frequency drives	\$110
Motor control	\$217
Introduction to microprocessors	\$233
Fibre optics 1	\$153
Basic programmable logic controllers for mechanical trades	\$137
Programmable controllers 1	\$306
Programmable controllers 2	\$306
Programmable controllers 3	\$306

INSTRUMENTATION

Intro to computerized process control	\$419
Computerized industrial boiler control	\$419

LEARNING SKILLS FOR TRADES

Reading comprehension	\$110
Study skills	\$53
C programming (T)*	\$472
Intro to IBM PC hardware (T)*	\$364

*Note: (T) indicates course directly transferable to diploma program credits.