



THE
UNIVERSITY OF
BRITISH
COLUMBIA

ingenuity

Faculty of Applied Science
Engineering News

Composite materials meet their match!

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Making and breaking materials. That's what the research of Associate Professor Reza Vaziri, jointly appointed in Civil Engineering and Metals and Materials Engineering, is all about.

On the one side, Dr. Vaziri specializes in the making of materials, or the modeling/computational processes by which composite materials and structures are made. On the other side, he looks at breaking those same materials and studying their behaviour—often during split-second events. For example, Dr. Vaziri might refine the structural design of a piece of body armour and then observe the behaviour of the armour material as it is

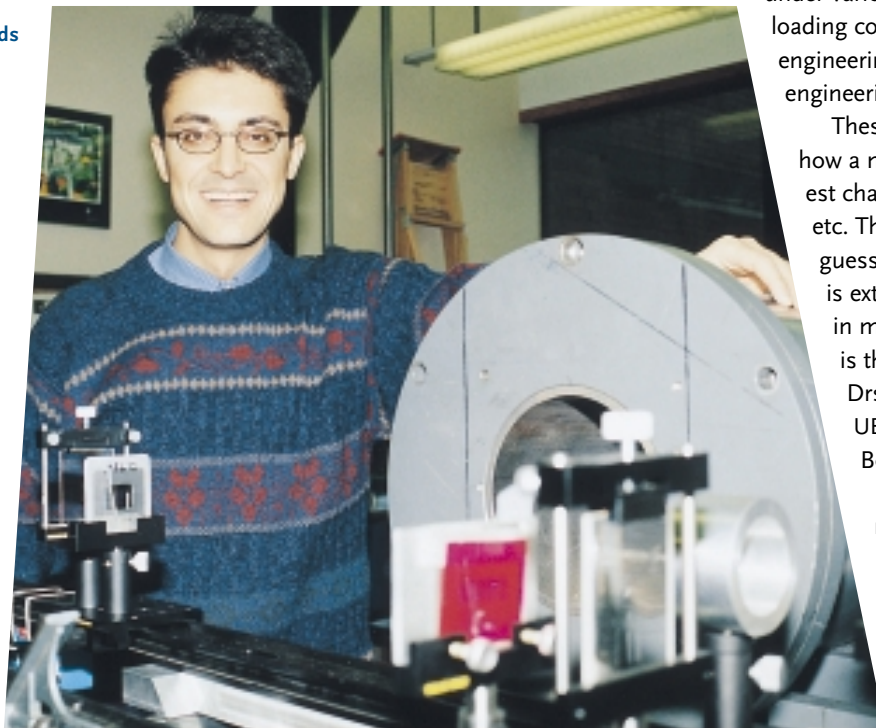
Dr. Reza Vaziri reveals the science of making and breaking materials

penetrated by a bullet. The analysis that follows might result in future armour that is stronger, lighter or more durable.

"I am interested in the interdisciplinary application of materials within structures, whatever those structures may be," explained Dr. Vaziri. "In other words, I want to know all of the characteristics of a given material and I want to know how it behaves—this is where I borrow from the expertise available in metals and materials engineering. Then I take all of this information, put it in mathematical terms, and feed it into a computer program that can simulate the material's behaviour under various environmental and physical loading conditions. And this is where my civil engineering, or more specifically, my structural engineering background, applies."

These simulations allow Dr. Vaziri to learn how a material will respond to even the slightest changes in temperature, pressure, load, etc. This advanced information removes guess-work and potentially costly errors, and is extremely valuable for companies involved in manufacturing. A good example is the work that Dr. Vaziri, together with Drs. Poursartip and Fernlund of the UBC Composites Group, does with The Boeing Company.

"A large portion of the traditional manufacturing process is based on trial and error; employees build the various airplane components, such as the wings, in a certain way based on past experience," commented Dr. Vaziri.



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Message

from the Dean

I am pleased to present you with the Spring/Summer 2000 issue of *Ingenuity*, and hope that you find it of interest. The Faculty continues to make good progress on a number of fronts. A recent site visit relating to the accreditation of all our programs by the Canadian Engineering Accreditation Board took place in November, and we are optimistic that all our programs will continue to be fully accredited and held in high regard.

Other recent activities include the approval of two new programs: The Software Engineering Option in Computer Engineering has been approved and will commence next September. We expect that the option will help meet the growing industry demand for professionally trained software engineers. Similarly, the new Master of Software Systems program has now started and is already in great demand, particularly by working professionals seeking to expand their knowledge in the specialized area of software systems. Both of these exciting programs are discussed at length in this issue.

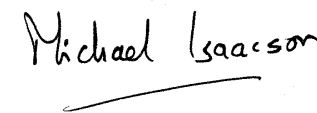
Engineering alumni will be pleased to read the alumni update on page 12. This article includes information about three upcoming alumni reunions for the classes of 1950, 1960 and 1970. I am pleased to be hosting these events and I look forward to meeting many alumni in person. The other exciting news is that as a Faculty, we have appointed a new Alumni Relations Officer, May Cordeiro. She is already working closely with the UBC Alumni Association in preparation for the many reunions that will take place later this year.

On a more personal note, I am approaching the midpoint of my six-year term as Dean and have therefore taken the liberty of providing you with an extended message within this issue of *Ingenuity* (pages seven to 10). In it, I take stock of the Faculty's accomplishments over the last few years, assess what remains to be done, and indicate our intended approaches to doing so. Briefly, the message can be summarized as follows: We come from a position of considerable strength and have an outstanding reputation; we are undertaking some exciting initiatives, but we face a challenging environment and are in need of

additional financial resources. We intend to secure these resources, in part, by launching a fundraising campaign in the coming year. I hope you will give some attention to this message and consider creative ways to offer your support.

I would like to take this opportunity to pay tribute to the Associate Deans—Dr. Perry Adebar, Dr. Guy Dumont, and Dr. Bruce Dunwoody—the Engineering Department Heads and Directors, and all faculty members and staff of the Faculty of Applied Science. Their very considerable efforts continue to assure delivery of high quality programs and services to our students and external partners. I also extend my appreciation to our many alumni, friends and partners outside the university for their support of the Faculty in a variety of ways.

Please contact me—by letter, telephone (604) 822-6412, fax (604) 822-7006, or e-mail dean@apsc.ubc.ca—if you would like further information on the Faculty's activities, if you can assist in the development of the Faculty, or if you have any suggestions to provide.



Michael Isaacson
Dean



Priorities in perspective

Dr. Alan Russell balances academic needs with growth and department spirit

According to Civil Engineering Department Head Dr. Alan Russell, there's nothing like history to put the present in perspective. "Last fall, I attended the class of 1949 reunion. It was a unique opportunity to reflect on how much we are accomplishing today with relatively the same resources.

"For example, in 1949 we had about 24 faculty members. Fifty years later we have approximately the same number of full time faculty, but we have seen big changes in the number of students. In 1949, the graduating class was roughly 60 students. Today it is about 100. Graduate student numbers have increased as well, from none to 265 in 1999. Clearly, we are investing more time in teaching and we place a much higher priority on research as well."

These changes reinforce Dr. Russell's belief that an important part of his role as Department Head is making choices and setting priorities. One of his current priorities is earthquake engineering.

"Recently, we received a major equipment grant to upgrade our earthquake shake table, which will give us increased capacity and modeling capability." This is good news, but Dr. Russell hopes to go one step further with a Canada Foundation for Innovation (CFI) proposal for \$2.5 million. "If accepted, the proposal will

have a tremendous impact on our current facilities, making us the pre-eminent earthquake research group in Canada.

"Another initiative that we're working on is the Building Science and Enclosure Design Chair. It was sparked in part by the leaky condo issue, but the main drive behind it is two-fold: First, there is an industry need to better understand the design, construction, operation and maintenance of building enclosure systems. Second, this is a market opportunity for Civil Engineering, particularly in the area of materials and structures.

"Through this Chair, which is a joint initiative with the School of Architecture and the Department of Wood Science in the Faculty of Forestry, we want to establish an outreach component. For example, the Chairholder might offer, on an on-going basis, a short course for practicing professionals or may publish good practice guides," explained Dr. Russell. "Most important, this initiative will help us address the connection between the Faculty and the engineering and architectural professions."

For undergraduate students, Dr. Russell's focus is on enriching the university experience by reducing course loads to a maximum of six courses per term, and promoting the new Designated Design Elective initiative. "These electives



are intended to make students think about the broader issues of design. Rather than focussing only on the solution, we ask students to think about all of the considerations that go into development of a solution."

For graduate students, growth of the Partnership Program is the priority. For several years now, the Department has been connecting some of its graduate students with public and private companies that sponsor the students to work on research problems of direct company interest. "It's a win-win situation for all involved," emphasized Dr. Russell. "Students get financial support and interesting research challenges, faculty members get some assistance in funding their research and increased contact with industry, and industry partners get problems of interest addressed."

It's a positive program that we hope to continue to grow."

Growth is a recurring theme in Civil Engineering. Like many departments at UBC, this one is faced with a substantial number of upcoming retirements and the need to recruit new people. By the year 2003, more than half of the department's faculty members will be different from those 10 years earlier. "At the moment, we have several internationally recognized research groups and the challenge will be to attract similar calibre people to maintain that reputation." In Dr. Russell's mind, it will be just as important to find people who fit in with the larger department environment. "Civil Engineering has a reputation for being very 'civil.' We have a very nice environment where people enjoy coming to work. I feel a strong obligation to maintain that spirit for everyone—faculty, staff and students."

Innovative programming for professionals

Faculty launches new Master of Software Systems program

In January, the UBC Centre for Integrated Computer Systems Research (CICSR), in partnership with the Department of Electrical and Computer Engineering and the Department of Computer Science (Faculty of Science), launched an innovative new program aimed at students and working professionals alike—the Master of Software Systems (MSS). This new program brings together several years of hard work, planning, and design, carried out by representatives of both departments and led by CICSR Director Rabab Ward.

Judging by student response so far, the program is a hit. “With very little advertising, we quickly received 60 outstanding applications and we could accept only 25 students in this first, pilot run. It was overwhelming,” said Program Director Dr. Panos Nasiopoulos.

The program is designed to prepare graduates with degrees in scientific and engineering subjects other than computer science or computer engineering, for the specialized area of software systems. The program curriculum focuses on the problem solving and technical or analytical skills of these graduates, and rapidly brings them to graduate level expertise in software systems.

“Besides new graduates, many of the people enrolled in the program are working professionals who want to upgrade and expand their knowledge of software systems in order to do their jobs better,” explained Dr. Nasiopoulos. “They come from many different backgrounds, but all have some connection to software—either because they manage software people or because they use software themselves.”

In many cases, graduates may go on to pursue new careers in BC’s rapidly expanding software industry, perhaps the most attractive sector of today’s economy.

“Even though the program starts at an introductory level, it does go all the way to graduate level,” emphasized Dr. Nasiopoulos. “People must understand that, like any masters degree, this program requires a lot of effort. Students work hard, but they learn everything they want to know about software systems.”

The MSS program is a full-time, 16-month, undertaking consisting of 30-credits of specified courses and a mandatory four-month industry internship. For more information about the program and admission for January 2001, contact Dr. Nasiopoulos at (604) 822-6894 or visit www.cicsr.ubc.ca/mss.

Software Engineering Option answers industry need

This fall, the Department of Electrical and Computer Engineering will answer a long-standing industry need by offering students a new Software Engineering Option in Computer Engineering.

“The need for formal software engineering education has been around for quite some time, but our reasoning in pushing forward now is two-fold,” explained Electrical and Computer Engineering Professor Mabo Ito.

“First, the Association of Professional Engineers and Geoscientists of British Columbia (APEGBC), recently announced that it will recognize software engineering as a discipline for registration, meaning graduates can become registered as professional software engineers within this province. This is a strong incentive for universities, like UBC, to begin graduating students in this discipline,” said Professor Ito, who is also a member of the APEGBC Software Engineering Registration Committee and a lead advocate of registration for this discipline.

The second reason is the industry need for professionally trained software engineers.

“Right now, many of the people employed in software design lack the necessary background to produce robust, well engineered products,” commented Professor Ito. “Often they have training in hardware or programming, but have very little experience in software design, testing or analysis.”

“Through the Software Engineering Option, we hope to apply engineering principles to the process of software design to produce better trained engineers and better products.” This kind of training will allow graduates to design products that are predictable and testable, characteristics that are crucial to a company’s real time or mission critical systems, such as telephone switches or an air traffic control system.

Computer Engineering students at UBC will be able to select the Software Engineering Option at the start of their third year of study. The curriculum foundation is based largely on the concepts of computer engineering and computer science, while some of the electives will include software and system testing, advanced networks and security, advanced real-time systems, and system analysis and architectural design. Upon completion, students graduate with a Bachelor of Applied Science degree in Computer Engineering with the Software Engineering Option.

Faculty Development

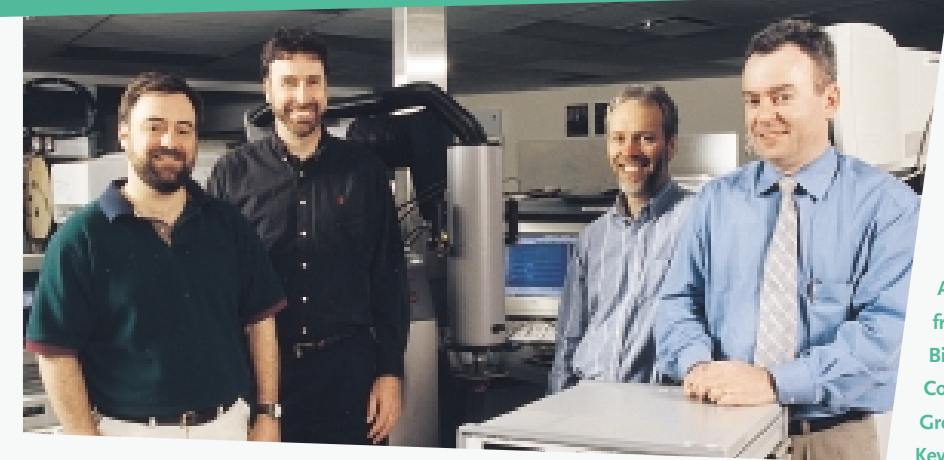
A new perspective on university support

By Mona Miller-Tait

Last year, displaying generous support for their alma mater, six very successful graduates, who were among the original founders of the successful broadband communications semiconductor company PMC-Sierra, established a series of prestigious awards in the Department of Electrical and Computer Engineering: The PMC-Sierra Founders’ Awards in Computer or Electrical Engineering.

Greg Aasen (1979), Colin Harris (1980), Kevin Huscroft (1979, MASC 1984), Winston Mok (1984, MASC 1989), Bill Richardson (1983) and Graham Smith (1979), established an endowment valued at approximately \$504,000 for the awards. The endowment will result in a primary award valued at \$10,000, and four smaller awards valued at \$5,000 each. All awards will be presented annually to deserving students.

Kevin Huscroft (Vice President, Research & Development and Chief Technology Officer of PMC-Sierra), who is also an active member of the Faculty’s Engineering Advisory Council, initiated the awards. “I received scholarship support as a student, and I know what a difference that made for me,” said Huscroft. “Both the financial support and the encouragement factor were important.”



Awards founders, from left to right: Bill Richardson, Colin Harris, Greg Aasen and Kevin Huscroft.

Great graduates show their support

The creation of the PMC-Sierra Founders’ Awards

Kevin Huscroft likes the idea of giving something back to his alma mater at the same time as building awareness in the student body about PMC-Sierra, and about the growing importance of the microelectronics field. “It’s a rapidly growing field, full of challenges and opportunities for innovation.”

Greg Aasen, Chief Operating Officer of PMC-Sierra, agrees with Mr. Huscroft. As the largest donor to the award fund, Mr. Aasen regards this scholarship as an important vehicle to establish a link between students, the university and the company he operates. “It’s a good investment,” he said.

The donations were made in the form of gifts of securities. Currently there is a favourable tax legislation climate for gifts of shares, in which the net cost of a gift of appreciated securities is

significantly less than that of donating an equivalent amount of cash.

The Faculty also is honoured by its many other associations with PMC-Sierra, including the NSERC/PMC-Sierra Chair in Microelectronics and the company’s active involvement with our co-op program. As well, PMC-Sierra is hiring more graduates of Electrical and Computer Engineering than any other company.

PMC-Sierra is a Burnaby-based company with sales offices around the world and several design centres within North America. The company’s dedicated team of employees, which has grown from 29 to 700 in the past seven years, is focussed on providing customers with Internetworking semiconductor solutions to enable the restructuring of the Global Information Infrastructure.

The PMC-Sierra Founders’ Awards will be awarded on an annual basis to students in Computer or Electrical Engineering, or in the Electrical Option of Engineering Physics. The Awards are granted on the basis of academic achievement, leadership and entrepreneurship, to students with interest and achievement in communication system design or integrated circuit design.

To find out more about PMC-Sierra, visit www.pmc-sierra.com. For more information about the Founders’ Awards or gifts of securities, please contact our Faculty Development Officers, Mona Miller-Tait at (604) 822-0603 or David Petis at (604) 822-6197.

Creating a lasting legacy

Your questions answered about estate planning and gifts to UBC

Our Fall 1999 issue of *Ingenuity* featured a popular article about estate planning, “Engineering a lasting legacy: Elizabeth and Leslie Gould help secure the future of Applied Science.” As a result, our Development Office has fielded numerous questions about the logistics of leaving legacy gifts and we share those, and the answers, with you here. Should you have additional questions or require more information about current projects, other ways of giving, or the associated tax advantages, please contact Faculty Development Officers David Petis at (604) 822-6197 or Mona Miller-Tait at (604) 822-0603.

Financial support from individuals and the private sector is essential to the continuity of quality engineering education and research for future generations of engineering students at UBC. Every year, large numbers of alumni and friends contribute generously with time and money. Many more would participate if only they were fully aware of the options surrounding will or estate planning and the potential tax benefits involved...

How do I leave a gift for Applied Science, Engineering, a specific department, or a research initiative that I admire?

It's easy. You can arrange for a gift in several ways. The most common is a present day gift, but a charitable gift through a bequest in a will can be just as simple. Many people set aside a certain dollar amount. Others leave a percentage of their estate or any assets left over after providing for their families.

Some people donate something they own, such as their car or home, and others leave a paid up life insurance policy, securities, retirement account or other financial investment. All can be donated, and in most cases, they create a favorable tax situation for you or your estate.

Must I have an estate in order to leave a gift?

Everyone can leave a gift. “Estate” is simply a word used to describe everything that you own at the time of your death. Most people leave an estate when they die, even though they may not necessarily have a great deal of wealth.

Do I have to include my wish to leave a gift to Engineering at UBC in my will?

Yes. A charitable bequest will not take effect unless you state your intention in your will. Without a will, you lose control over your property after death. Your property and finances are settled according to provincial laws whether or not they coincide with your and your family's wishes.

Do I tell the Faculty of Applied Science Dean's Office that I've left a gift?

This is up to you. Often it helps us to know in advance so we can recognize your generosity and prepare for the future. We also can work with you to develop opportunities for giving for a specific purpose or project.

How do I leave a gift in memory of a person?

A gift is a wonderful way to recognize someone who has made a difference in your life.

Memorial gifts (with the associated naming opportunity) can be made as a present day gift or by arrangement in your will, where you would make it clear that the gift is given in memory of a particular person.

Who can help me arrange for a gift?

The Faculty of Applied Science Development Office may be a good source of information. Or, if you have a professional advisor, such as a financial or estate planner, lawyer, accountant, trust officer or insurance agent, you may consider speaking to him or her about leaving a gift.

A professional advisor can tell you about the tax benefits of planned gifts and ensure you receive the maximum tax and legal advantages allowed for your gift.

How can I leave a legacy to Engineering at UBC?

If you are interested specifically in leaving a legacy to Engineering at UBC, the first step is to think about the area or initiative you'd most like to help. Maybe you have benefited from a particular program or have fond memories of specific activities during your years as a student. Or maybe you believe in the importance of research in a particular discipline. Perhaps you believe strongly in the mission of Applied Science and Engineering and wish the gift to be designated by the Dean on the basis of priorities at the time.

If you need more help or you would like to know more about a particular program or initiative, we encourage you to do some investigating before leaving a gift. Call us. We can tell you more about what we do, what opportunities are available for giving, and how your gift will allow the Faculty to continue to improve its world reputation as a leader in teaching and research.

The way ahead

A letter from the Dean on the status and needs of the Faculty of Applied Science

It is hard for me to believe that I have been a faculty member at UBC for nearly 25 years! Over this period, I having continuously shifted the balance of my contributions between teaching (primarily fluid mechanics), research in coastal engineering, industry interactions, and service to my Department, the Faculty, the University and the profession — while ensuring that these component activities have always been closely intertwined. My career to date has been so very rewarding, and I have benefited enormously by my daily interactions with many wonderful colleagues both within the university and outside it. I am now approaching the halfway point of my six-year term as Dean, and so this seems an appropriate time to take stock of the Faculty's recent accomplishments, to assess what remains to be done, and to consider how best this can be achieved. In order to do so, I have taken the liberty of using this issue of *Ingenuity* to provide you with an extended message that lays out my views on these matters.

The past

The Faculty of Applied Science at the University of British Columbia has a long and proud history. It was one of the three founding Faculties of the University, admitting some of UBC's first students in 1915. Over the last 85 years, the Faculty has produced many talented graduates who have gone on to serve the Province and the Country. Indeed, the very development of our Province — from its resource sector, including forestry and mining, to its transportation networks, to its physical infrastructure, and more recently to its high tech sector — may be attributed to a significant extent to the remarkable contributions of the outstanding engineers who have graduated from UBC. One of my most pleasurable duties as Dean has been to attend reunions and individual meetings with our alumni, some of whom graduated as far back as the 1930s, and to learn of their remarkable careers and their immense contributions to society. I take great pride in the knowledge that I am

the tenth Dean to serve the Faculty (see sidebar).

The Faculty was British Columbia's only engineering school until the 1970s. Even today, it remains the only engineering school in BC that provides programs and research across a wide range of engineering disciplines, graduating some 75% of BC's engineering graduates.

The present

Today, the engineering component of the Faculty includes some 120 faculty members and 70 support staff, and it is assisted with a budget from the University of approximately \$14 million per year, and with a further \$16 million a year in research grants and contracts secured by its faculty members. The Faculty includes six engineering departments, and offers ten BASc programs that have a total enrollment of close to 2,400 undergraduate students. The Faculty also offers graduate programs over a wide range of fields, with an enrollment of over 700 students. As well,

research is carried out across all the major engineering disciplines.

Planning

When I became Dean in 1997, I led the Faculty in a strategic planning process which was complementary to the development of the University's overall vision, *Trek 2000*. We established the Engineering Advisory Council in 1998, and this body assisted us with the development of our Strategic Plan, which was formally adopted in November 1998, and which is updated and approved annually. The planning process has confirmed the Faculty's mission for engineering, which is “to provide our students with an outstanding and distinctive engineering education and to conduct leading research that serves the people of British Columbia, Canada, and the world.” The Plan also outlines the principal goals that support this mission: two primary goals relating to the twin components of our mission — education and research — and three supporting goals relating to our people, our

Deans of the Faculty of Applied Science 1915 - 2000

Reginald W. Brock	1915 - 1935
John N. Finlayson	1935 - 1950
H.J. MacLeod	1951 - 1954
Henry C. Gunning	1954 - 1959
David M. Myers	1960 - 1965
William Armstrong	1966 - 1969
W.D. Liam Finn	1970 - 1979
L. Martin Wedepohl	1979 - 1986
Axel Meisen	1986 - 1997
Michael Isaacson	1997 -

relationships with external communities, and our infrastructure and resources. The Strategic Plan has subsequently been complemented by other component plans, including a Research Plan, a Faculty Hiring Plan, a Financial Plan and an Operational Plan.

Education

Given the large numbers of students enrolled in engineering, one of our ongoing challenges is to ensure that we maintain the very best quality in engineering education. I believe that indeed we do so. As one indicator of this, the *Princeton Review* ranks each of our BASc programs as either first, second or third in

Canada, out of some 30 engineering schools, and as being among the top tier in North America. In particular, our mining program ranks as the best in Canada and the second best in North America. In addition to ensuring the quality of our programs, we are constantly updating them and making progress on a number of exciting new initiatives. The new Commerce Minor in all our engineering programs, the new Arts/Engineering combined degree program, and the Project Integration Program in Electrical and Computer Engineering are all evidence of our commitment to improving the quality and relevance of the undergraduate education experience. Furthermore, we are transforming our first year engineering program so as to provide incoming students with significant exposure to engineering in their first year through case studies and project-based learning.



Dr. Peter Lawrence with second-year students participating in the new Electrical & Computer Engineering Project Integration Program (PIP).

Research

Excellence is also the hallmark of our research. Our overall research theme relates to the creation and development of advanced technologies that enhance the well being of society. Within this overall theme, the Faculty's research is expressed through three closely linked sub-themes. The first relates to the high technology sector, including areas such as control and robotics, IT and communications, and microelectronics. The second relates to the environment, including minimizing society's impact on the environment (e.g. through "clean energy" and sustainable development issues), coping with environmental impacts (e.g. from natural hazards), and utilizing the environment, such as through resource development. And the third relates to improving our quality of life, such as through biomedical engineering, public health engineering, and risk reduction and mitigation.

Again, on the research front the Faculty consistently ranks amongst the top of engineering schools in Canada on the basis of indicators such as research funding levels, participation in the Networks of Centres of Excellence program, the relative numbers of patents filed and spin-off companies created, and the honours and awards secured by our faculty members. We have so many internationally recognized faculty members and distinguished alumni who serve as testament to our sustained excellence in research. As one indication of our stature, UBC boasts about 30% of engineering faculty members who are Fellows of the Canadian Academy of Engineering, and about 20% of those who are Fellows of the Royal Society of Canada — which are remarkable numbers considering that UBC employs only about 5% of Canada's engineering faculty members.

The current environment

While we have a world class reputation in engineering education and research, we cannot rest on our laurels. We need to plan for our future by taking careful account of the environment in which we operate — both within the Province and within the University community. Engineers work in virtually every major sector of the British Columbia economy, including communications, construction, forestry, manufacturing, mining, oil and gas, tourism, transportation, the high technology sector, utilities and more. Engineers started most of BC's successful high-tech companies, such as Creo, Ballard, Dynapro, Glenayre, MDA, and PMC-Sierra. BC's high-tech industries and their engineers contribute significantly to economic wealth, with exports measured in billions and with many well-paying jobs for engineers and others. Our engineers also serve society in BC and worldwide in many other ways, such as through technical research and development, infrastructure renewal, environmental protection and resource development. They are helping to raise the standard of living of people in BC and around the world.

However, although the engineering profession continues to have an immense impact on our society, there are some severe warning signs. The proportion of engineers making up the labour force in BC, which is a key indicator of productivity growth, the proportion of university graduates in engineering, and the proportion of the professoriate in engineering, which perhaps indicates the relative scale of engineering research activity, are all well below the national average. In particular, there is a massive unmet demand in BC for engineering graduates — senior executives of PMC-Sierra recently stressed their continuing need to hire approximately 100 engineers per year.

How best can British Columbia universities, and UBC in particular, respond to these provincial needs? While the Faculty of Applied Science is a leader in engineering education and research, it has faced unprecedented challenges over the last few years. The demand for our graduates has been high; and, at the same time, the demand for entry to our programs has also been high, with over 2,000 qualified applicants per year for the approximately 600 places currently available. This means that we are turning away large numbers of qualified British Columbians from careers in engineering. While university participation rates in BC historically have been below those of other parts of Canada, the need to increase non-targeted university access at the lowest possible cost drives students into less expensive programs, so that enrollment growth in engineering has been relatively static. Equally serious is the challenge we now face in attracting and retaining engineering faculty due to lucrative industry offers and international competition. Underlying these factors is the hard reality that our level of funding per student remains relatively low. A recent analysis has indicated that our Faculty's budget shortfall relative to the average of nine prominent engineering schools in Canada is \$5.1 million per year, on the basis of dollars per weighted student — and when normalized to UBC's current budget is still \$2.6 million per year. We are pleased that the University is now recognizing this disparity, in part by an allocation last year of \$300,000 per year. However, it is clear that much remains to be done in order to bring our operating budget up to appropriate levels.

Needs and approaches to meeting them

Given our current standing and activities and the nature of our external environment, we have identified three priority areas which we believe will enable us to enhance our world class standing, while ensuring the maximum benefit to British Columbia:

- we need to continue attracting outstanding students and to provide them with the best education experience possible;
- we need to attract and adequately recognize world-class faculty members; and
- we need to build and modernize the physical infrastructure of the Faculty.

In order to meet these needs, the simple fact is that we have to increase our base of financial support. UBC is a public university whose operation will continue to rely primarily on government allocations (and, to a lesser extent, on tuition fees). But it is clear that private sector support has become increasingly critical to ensuring that the University remains at the forefront of post-secondary education and research. Taking this into account, we have developed a detailed fiscal strategy identifying the resources and approaches necessary to realize our ambitions. We plan to move forward using two approaches, both of which require the strong support of our alumni and other partners. The

first is to ensure the centrality of engineering to UBC and to secure increases in our annual operating budget. For this, we all need to advocate vigorously for the importance of engineering, whether this be within the university community, the business community, or the public at large. We must communicate at every possible opportunity the critical role played by engineers and engineering schools.

The second approach is to increase private sector and alumni support for the Faculty. The vehicle to doing so is through a Faculty fundraising campaign targeted to the three priority areas identified above. Allow me to elaborate on each of these and the nature of the support required:

The student experience

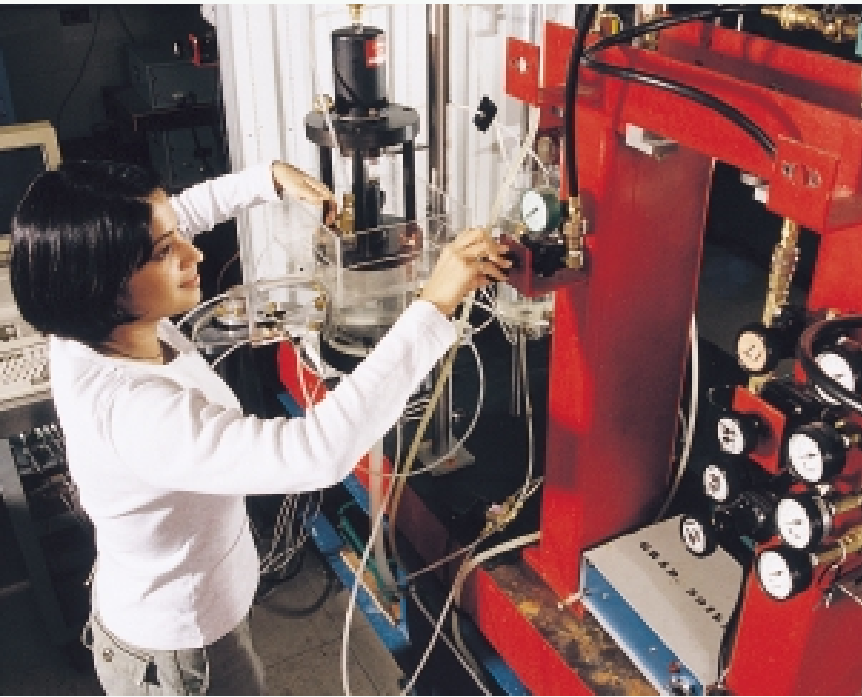
We need to provide our students with the best learning experience possible. We welcome donations in support of our students directed to the Dean's Endowment Fund For Students. Currently, the University's policy on endowments is to expend six percent in interest income annually, and to recapitalize the remaining interest income in order to protect the real value of the investment. Opportunities for giving through the Dean's Fund include Scholarships, Bursaries, the Cooperative Education Program, the Mentorship Program, Student Recruitment, and Student Projects. Gifts may be undesignated, or restricted to one of these six categories, or restricted to one of our six engineering departments.

Recruitment and retention of outstanding faculty

Relatively large numbers of faculty members are due to retire over the next few years, there has been an increased number of faculty resignations over the past year, and at the same time it is becoming increasingly difficult to attract outstanding faculty to UBC. Therefore it is critical that the conditions of employment and the working environment for our faculty members are made as attractive as possible. We are attempting to deal with these issues in several ways.

Dr. Carlos Ventura explains the intricacies of earthquake engineering to undergraduate students in Civil Engineering.





A graduate student checks the status of her project in the Civil Engineering Soils Laboratory.

One critical approach is to increase the number of chairs and professorships in the Faculty, so as to provide our faculty members with salary supplements, some operating expenses for teaching and/or research, and the added prestige that such appointments entail. We are doing so by creating endowed chairs, endowed professorships, and term professorships, any of which may be directed in support of either teaching or research, and may be either unspecified or targeted to a specific discipline or department. Each endowed chair has a goal of \$2.5 million, which includes \$500,000 (or equivalent recurring support) to be provided by the Faculty. An endowment of this size generates \$150,000 annually, in perpetuity, to be applied to the salary of the named chairholder, and to some of the associated teaching or research expenses. Each endowed professorship has a goal of \$500,000, which generates operating income of \$30,000 annually, to be applied as a salary supplement to the named professor, and to some of the associated teaching or research expenses of the professor. Each term professorship has a goal of \$150,000, which generates \$30,000 per year over a five-year term, for purposes similar to that of endowed professorships.

Enhancing the physical infrastructure

Our need to modernize existing facilities and create new physical infrastructure has a direct impact on our ability to enhance our students' learning environment and to attract and retain outstanding faculty members. We require modern laboratories and facilities that will better prepare our students for successful careers, and that will enable our faculty members to respond better to the research needs of industry. Some of our most pressing infrastructure needs include the new Chemical and Biological Engineering Building, an expansion of our Electrical and Computer Engineering Building, new Project and Design Laboratories, and an Engineering Equipment Fund. We are in the process of developing business plans for the major building projects, with capital funds to be secured through private sector support, to be matched up to several times the amounts donated, through revenue generation associated with mixed usage of building space, and through grants and allocations from various agencies.

If you choose to support the Faculty in any of the ways indicated above, there are many different opportunities for giving. These include outright gifts of cash, securities and property, as well as pledges that can be met over several years. And there are several options for planned giving, which include life insurance policies, bequests, insured annuities, gifts plus annuities, charitable remainder trusts, and remainder interests in real property. Currently, gifts of securities are particularly attractive as current legislation offers significant tax advantages associated with gifts made prior to December 31, 2001. And with any kind of gift, we offer significant naming and recognition opportunities, either for individual or corporate donors, or in honour or memory of designated individuals. In future editions of *Ingenuity*, we hope to highlight the generosity of our alumni and industry partners.

Conclusions

In this message, I have attempted to summarize the Faculty's current status, highlight some of its recent initiatives, and outline its current priorities and intended approaches to meeting these needs. Success will mean that the Faculty will advance its outstanding reputation in Canada and North America in engineering education and research. With your support, I am confident that the Faculty of Applied Science at UBC will remain one of the leading engineering schools in North America, producing the research, facilitating the technology transfer and generating the highly skilled engineers that are so needed by British Columbia and Canada.

Michael Isaacson
Dean

Around the world with a mining engineer

Former department head shares memories, advice and success

Dr. George Poling has mined copper in central Africa, taught gold processing in Colombia, explored for diamonds in Canada's Northwest Territories, and established himself as a leading expert in the environmental management of mining operations. Somewhere in the middle, he found time to serve as a professor, department head, and supporter of the Department of Mining and Mineral Process Engineering (MMPE) at UBC.

Dr. Poling got his start with a mining engineering degree from the University of Alberta. Five years into his career, he was invited to come to UBC as an Associate Professor in Mining and Mineral Process Engineering. "I taught at UBC, almost continuously, from 1968 to 1997, and served as Department Head for eight years.

"As Department Head, I remember facing constant budgetary challenges and the need to do more with less," recalled Dr. Poling. "In that climate, it was difficult to show initiative unless you could figure out ways to augment your budget from outside sources, such as industry and alumni."

Throughout his academic career, Dr. Poling maintained consistent work as an industry consultant. One of his most notable assignments involved the Island Copper Mine project. "For almost 30 years now, I've been part of an independent advisory team overlooking the environmental protection and reclamation of the BHP Island Copper Mine on Vancouver Island.

"About four hundred million tonnes of tailings (sand) from the mine were deposited on the bottom of a marine inlet through a technique known as submarine tailing placement," explained Dr. Poling. "It was, and still is, a very controversial project, but it has been very successful. We have almost 30 years of very detailed monitoring proving that."

Due to the success of Island Copper, Dr. Poling is now co-writing a scientific volume with other advisors from UBC, SFU and UVIC. His role in the reclamation work has contributed significantly to his reputation as one of Canada's leading experts in mineral processing and environmental management of mining operations.

Dr. Poling's expertise led him to another exciting project involving Dia Met Minerals and the Ekati Diamond Mine, located in the Lac de Gras area of the Northwest Territories. The Ekati Mine, which is partly owned by Dia Met, became Canada's first diamond mine when it came into production in October 1998.

Dr. Poling got involved with Ekati through his long association with Mr. Chuck Fipke, the Chairman of Dia Met Minerals and the main discoverer of the Ekati Mine.



Today, Dr. Poling sits on the Dia Met Board of Directors and helps oversee the company's \$10 million per year exploration budget.

These days, Dr. Poling also is the Senior Vice President of Rescan Environmental Services Ltd., a Canadian consulting firm specializing in environmental management. It is a job that draws on the experience acquired through his varied and extensive career.

A few years ago, Dr. Poling's collective career success allowed him to give something back to UBC's Department of Mining and Mineral Process Engineering. Recalling the days when a little outside income would have given him freedom for initiative, Dr. Poling made a gift of Dia Met shares valued at approximately \$164,000.

"I was anxious to give something back to the department and I feel that I've been pretty fortunate. I left the gift open, directing only a small portion of it to the Mining Engineering student clubs. I wanted to help the students, but I also wanted faculty members to put their heads together and come up with new initiatives where they're needed most."

Dr. Poling was a bit ahead of his time in giving a gift of shares. Quite rightly, he noted that today, Canadian tax legislation has changed significantly, making gifts of shares very beneficial to donors.

Dr. Poling's life experiences may sound exotic, but he believes his adventures are attainable by all. "A lot of UBC graduates have been all over the world because the MMPE degree almost gives you an international visa," he explained.

"It's an adventuresome field. You get to see other cultures and how other people live—more than you would traveling as a tourist. In order to be successful, however, you have to have good communication skills and work well with people. Not only that, you have to be a person of your word. As an engineer, you have to give your word and then produce."

Alumni update

The Faculty of Applied Science is pleased to provide exciting news on the alumni front. First, we have several special reunions planned for this fall, and second, we have a new Alumni Relations Officer to help us organize them!

Effective January 2000, May Cordeiro accepted the newly created position of Alumni Relations Officer in the Applied Science Dean's Office. May will work closely with our two Development Officers, and our Communications Officer, as well as Jane Merling from the UBC Alumni Association Office.

Upcoming events

The year 2000 will be one of celebration marked by milestone reunions for the classes of 1950, 1960, and 1970 (see sidebar). Dean Michael Isaacson will host these reunion events personally, as part of the Faculty's ongoing effort to renew and strengthen relationships with our diverse engineering alumni.

Additional activities for the class of 1950 will take place on the University-wide Alumni Day 2000, which is a time when we

welcome back all alumni and friends of UBC.

During last year's Alumni Day celebrations, engineering graduates took part in luncheons, tours and other activities, including 50-year reunion festivities for Civil Engineering and Electrical/Mechanical Engineering. This year, we look forward to reuniting with even more alumni, particularly since we'll be marking yet another important date—the Faculty's own anniversary. Beginning

in September, the Faculty of Applied Science will launch 85th anniversary celebrations to mark our illustrious beginnings in 1915 as one of the University's original three Faculties. Surely now, you have more than enough reasons to come back to UBC in 2000!

If you'd like more information about any upcoming alumni events or you have news to share, please contact May Cordeiro at: (604) 822-9454, or visit www.apsc.ubc.ca/alumni.

Upcoming Reunions

BASc Class of 1950
Friday
September 29, 2000
Luncheon at
Cecil Green Park

BASc Class of 1960
Monday
October 2, 2000
5:30 – 7:30 PM
Evening reception at
Cecil Green Park

BASc Class of 1970
Wednesday
October 4, 2000
5:30 – 7:30 PM
Evening reception at
Cecil Green Park

Online efficiency

Applied Science leads the way in customized information technology

Wouldn't it be great if all of the information you needed about UBC was a mouse click or two away? This was the question foremost on the minds of the Faculty's Teaching Technology Committee when it recently launched *Academy 7* and plans for an ingenious series of online information management tools, including "myUBC".

"The Teaching Technology Committee was established by the Dean about a year and a half ago to lead the Faculty in incorporating new technology into teaching activities," explained Committee Chair and Metals and Materials Engineering Professor Dr. Mary Wells. "In that time, we've built up the committee to include representatives from almost all the Departments of Engineering as well as the Schools of Nursing and Architecture."

With the support of Faculty Teaching Technology Developer Matthew Lane, the committee has successfully launched *Academy 7*, an "in-Faculty" production facility that provides faculty and staff with seven different technology related services including: consultancy, digitising/scanning, production and management (of web pages, courseware and software), archiving, training, and technical support.

Through *Academy 7*, the committee has initiated an exciting joint venture project involving representatives from UBC Student Services, the Library and IT Services. Very soon, the group will begin trials on "myUBC," a user-centred information portal, which the UBC community will access via the Internet.

The concept behind "myUBC," which is described as a web portal, is to provide the right information to the right people at the right time, in a coherent and unified manner. Each user sees information that is uniquely relevant to him or her. As a student, you could access information about your current courses, grades, and assignments, as well as the contact information of your professors and teaching assistants. For an instructor, it would translate to easy online publishing of course material, and the ability to create powerful learning resources with input from research groups and industry contacts.

"A web portal addresses the issue of information overload", said Dr. Wells. "At UBC alone, there are thousands of web pages in publication. Each site is located in a different place, each with a different web address. Potentially, a web portal could bring all of this together."

One of the keys to creating a good user-centred system like "myUBC," is collaboration amongst the publishers of the information. Student Services, the Library, IT Services and the Faculty of Applied Science, have begun to discuss ways in which they can bring their systems together to create a unified experience for the end-users of the information.

"We set out to create a system and suite of tools to empower instructors, allowing them to manage and maintain

learning materials without the need for detailed knowledge of web-based publishing. This is where 'myUBC' began," recalled Dr. Wells.

At first, the team focussed on the needs of the students. The intent was to find out which courses students were registered for and then present them with information about that set of courses, together with online learning materials.

At present, the working prototype concentrates on the academic elements of the student experience. Renee Boileau, a third-year Engineering Physics student, has been working under the guidance of a senior instructor to set up a distance course for students on co-op placement. "The system has allowed us to put a distance course together in a very short amount of time. It's very flexible and ties together existing material from different sources, presenting them in a way that is clear and easy to navigate."

"We hope to have a prototype system of 'myUBC' by September 2000," said Dr. Wells. "For now we are focussing on the academic portion called 'myCourses.' Over time, the system can be expanded to include non-academic information about student clubs, library dues and everything related to the student experience at UBC. The final outcome will be a very powerful information system that delivers comprehensive information directly to the desktops of the people who need it most."

For more information about *Academy 7* or the "myUBC" project, contact Dr. Wells at (604) 822-1918, or visit the *Academy 7* web site at <http://academy7.apsc.ubc.ca>.



A sample screen from the "myCourses" prototype displays customized student information.

University-industry partnership yields environmental rewards

Civil Engineering and BC Hydro find new use for phosphate waste

With the help of a generous, \$400,000 contribution from BC Hydro, the Department of Civil Engineering is helping to launch an innovative phosphate recovery research program designed to retrieve phosphates from municipal and agricultural waste treatment facilities.

Phosphorus is a crucial fertilizer for aquatic and terrestrial systems. Currently, the commercial source is mined phosphate rock, but the supply is finite and given the present rate of consumption, it may be depleted by the latter half of the next century.

"Through the new recovery program," said Civil Engineering Department Head Dr. Alan Russell, "UBC and BC Hydro are trying to develop a commercial system to recover fertilizer-grade phosphates from human and animal waste. The system will enable society to return to the phosphorus recycling loop, where phosphates are recycled through, instead of the once-through system we currently use."

As a company that uses phosphate-based fertilizers to maintain nutrient levels in aging reservoirs, BC Hydro is very interested in this project. A phosphorus recovery system would provide Hydro with renewable reservoir and stream fertilization opportunities, while improving efficiency by lowering fertilizer costs and operating expenses.

"BC Hydro views this research program as an opportunity to develop and implement sustainable principles in our operations," said BC Hydro Chair Brian Smith. "At the same time, we are building partnerships – combining the energy of people and technology – to become leaders in environmental innovation."

To learn more about the phosphate recovery program or other opportunities for university-industry research collaboration, contact our Faculty Development Officers Mona Miller-Tait at (604) 822-0603 or David Petis at (604) 822-6197.



Racing away with hands-on experience

Formula UBC students gain skills in the business of automotive engineering

For a dedicated group of engineering undergraduates, the moment they've been waiting for is fast approaching. In a few short weeks, this year's Formula UBC team will make the trek to Detroit, Michigan to compete with more than 100 universities and engineering schools from around the world at the annual Formula SAE (Society of Automotive Engineers) Collegiate Design Competition.

The international event is sponsored by Daimler-Chrysler, Ford and GM, all of whom proudly associate their names with the student engineering contest involving the design, construction, and dynamic testing of open-wheeled racing cars.

Since first entering the competition in 1992, Formula UBC has made a name for itself by securing several top prizes including "Best Rookie Car" (1992), "Best Intake Manifold" (1995), and top Canadian finisher (1996). At UBC, the team has become a model example of project-based learning and student-driven education in action – both of which are top priorities in UBC's overall vision, *Trek 2000*.

As with all "formula" racing, there are numerous restrictions on the design for the Formula SAE vehicle to ensure that the knowledge, ingenuity, and imagination of competitors are challenged. What's more, the rules require that no car be driven in more than two competitions. The end result is a huge time commitment for all students who join the team. In addition to improving the next car's design and components, students must create a budget and timeline, solicit sponsorship and make travel arrangements. Just prior to competition, students may log 30 to 40 hours per week on the car, while keeping up with regular course work and exams.

At the competition itself, teams endure eight separately-judged events, earning marks for acceleration, fuel economy, and maneuverability, as well as engineering design and cost analysis. Such thorough competition ensures that team members come away with first-hand experience in marketing, project management, economics, and engineering design, making them very attractive to future employers.

"Involvement with the Formula SAE team gives students the opportunity to develop practical, hands-on engineering skills, as well as business skills," said Mechanical Engineering student Matei Ghelesel. "We operate the team much like a small business by ensuring that our customers (sponsors) are kept up to date, and that our product (the car) is delivered on time and up to spec. Employers look favourably on this experience." As evidence, several alumni now hold enviable jobs with Ferrari Formula One, Harley Davidson Motorcycles, and Ford/Cosworth racing in the CART (Championship Auto Racing Teams) series.

This year, in addition to competing, the team has decided to focus on marketing. They are eager to attract more sponsors and generate increased interest in automotive engineering by paying visits to high schools and participating in all major auto shows in the lower mainland. The team's current sponsors include companies such as Kawasaki, Creo, Westport, Aeco Design, and Chevron. They also receive annual support from the Faculty of Applied Science and the Department of Mechanical Engineering. All sponsors have provided generous support to date, and the team hopes that increased exposure will help them reach their 1999/2000 sponsorship targets.

If you would like more information about Formula SAE or you are interested in sponsorship opportunities, please contact the team at (604) 822-2970 or fsae@mech.ubc.ca, or visit their web site at www.mech.ubc.ca/~sae/.

Achievements

- Chemical and Biological Engineering Professor **John Grace** and Emeritus Professor **Norman Epstein** were honoured for their contributions to the field of chemical engineering by the Canadian Society of Chemical Engineering at the 1999 Century of Achievement Awards. Also recognized were former Chemical Engineering Professor **Leslie Shemilt**, and Chemical Engineering alumni **Jacob Masliyah** and **Eric Newell**.
- Chemical and Biological Engineering Associate Professor **Kevin Smith** was honoured with a Killam Teaching Prize in recognition of his outstanding teaching performance.
- Civil Engineering Professor **Peter Byrne** was presented with the Vancouver Geotechnical Society Award in recognition of his contribution to the Society and the practice of geotechnical engineering.
- Civil Engineering Professor **Eric Hall** and graduate student **Pierre Berube**, of the UBC Pulp and Paper Centre, were presented with the 1999 I.H. Weldon Award by the Pulp and Paper Technical Association of Canada.
- Electrical and Computer Engineering Professor **Nicolas Jaeger**, in partnership with UBC and the NxtPhase Corporation, won the Canadian Institute of Energy 1999 Energy Research and Development Award in recognition of their joint invention, a high voltage optical sensor.
- Electrical and Computer Engineering Emeritus Professor **Charles Laszlo** and Adjunct Professor **Jim McEwen** were honoured with Meritorious Achievement Awards from the Association of Professional Engineers and Geoscientists of British Columbia (APEGBC) for their distinctive and outstanding achievements in the professional and technical fields. Professor Laszlo also received the 1999 Solutions Through Research Award from the Science Council of British Columbia.
- Electrical and Computer Engineering Professor **David Pulfrey** was elected Fellow of the Institute of Electrical and Electronics Engineers (IEEE) in recognition of his long-term contributions to experimental and theoretical research in solid state devices, photovoltaics and computer simulation, as well as his excellent performance as a teacher and educator.
- Electrical and Computer Engineering Professor **Tim Salcudean**, along with a number of his graduate students, received the Best Demo and Best Poster Awards at the Institute of Robotics and Intelligent Systems NCE Conference.
- Electrical and Computer Engineering Emeritus Professor **Avrum Soudack** received a Killam Teaching Prize in recognition of his outstanding teaching in the area of circuit analysis, control systems and nonlinear methods.
- Mechanical Engineering Professor **Clarence de Silva** received the Education Award from the Dynamic Systems and Control Division of the American Society of Mechanical Engineers in recognition of his contributions to instrumentation and control education. Dr. de Silva also was honoured with a Killam Research Prize.
- Metals and Materials Engineering Professor **Anoush Poursartip**, along with several former graduate students and industry colleagues from The Boeing Company, received the Frye-Parry Award from the Society for the Advancement of Material and Process Engineering (SAMPE) for submitting the Best Composite Paper, based on originality and potential practical use, at the 43rd SAMPE Symposium.
- Mining and Mineral Process Engineering Professor **Janusz Laskowski** was recognized with the 1999 Taggart Award by the Society for Mining, Metallurgy and Exploration (SME) for having authored the best paper or series of papers in the field of mineral processing appearing in any of the publications of the SME during the past two years.

Appointments

Engineering Co-operative Education

- Ms. **Jenny Kagetsu** has been appointed Director of Engineering Co-operative Education following the departure of Ms. **Kelly Meechan**, who accepted a new position with **Stox Broadcasting Inc.** Prior to accepting the Directorship, Ms. **Kagetsu** served as Acting Director and oversaw the Chemical Engineering portfolio. As Director, she will manage the team of engineering co-op coordinators and lead the program's long term strategic direction.

Electrical & Computer Engineering

- Dr. **Guy Dumont** replaced Dr. **Anoush Poursartip** as Associate Dean of Research and External Affairs on January 1, 2000. In his new role, Dr. **Dumont** has many responsibilities including liaising with government and industry visitors, overseeing graduate programs and international activities, and assisting all Departments and Schools with research initiatives.

Metals & Materials Engineering

- Dr. **Indira Samarasekera** recently was appointed as UBC's new Vice-President of Research. On May 1, 2000, Dr. **Samarasekera** will begin a six-year term in this position, where she will play a critical role in enhancing the University's research capacity, strengthening its research performance, and promoting the transfer of research findings. We are extremely proud of Dr. **Samarasekera** and we wish her well in this exciting and challenging new role!

Metals & Materials Engineering

- Dr. **Steve Cockcroft** was appointed Acting Head of Metals & Materials Engineering January 1, 2000. Dr. **Cockcroft** assumes administration of the department and replaces former Head Dr. **Ray Meadowcroft**.

Composite materials meet their match

Continued from page 1

"The problem is that the shape of the structure made of composite materials tends to vary whenever you are working on a very large scale. The wing of an aircraft is constructed in one solid piece using huge autoclaves. It is a very complex manufacturing process. If the final shape of the manufactured part comes out just a little bit different than intended, it may not fit the rest of the aircraft and the part must sometimes be scrapped, which is very expensive.

"In our work with Boeing, we have been trying to help make their manufacturing process more efficient. By enhancing our scientific understanding of the process, we can better control the various elements before and during the actual manufacturing," said Dr. Vaziri.

The Boeing Company has been extremely supportive, both financially and technically, of the UBC Composites Group research activities. "It is important to have industrial partners like Boeing, who are willing to share their real world experiences," emphasized Dr. Vaziri.

Shifting to the "break" or usage component of his research, Dr. Vaziri can

mention several more valuable partners such as the Canadian Department of National Defense and Pacific Safety Products, Inc., of Kelowna, BC, who manufacture clothing and body armour for the military.

"Both the US and Canadian governments, as well as the wider defense industry, are interested in our work into the impact behaviour of composite materials. At the most basic level, this involves experiments where we shoot projectiles at various materials, such as Kevlar®, and try to simulate the same material behaviour on a computer," noted Dr. Vaziri. "Once we have that information, we can freeze the event [the moment when the projectile penetrates the material], and determine the mechanics of how the material failed or allowed the projectile to pass through.

"We are interested in knowing how and why a projectile defeats a given material, and then, perhaps, finding ways to stop the projectile earlier or with less material. That's where the engineering comes in."

Dr. Vaziri is quick to acknowledge that his research offers certain

challenges. Perhaps the two greatest lie in the ability to characterize and understand new materials as they come out, and, parallel to that, the ability to develop realistic computational models.

"The materials and the models go hand in hand, so it is important that they improve at the same rate," explained Dr. Vaziri. "If the materials improve faster than the computer modeling ability, then you have to revert to trial and error because you are faced with technical limitations. Conversely, if your computational work advances at a greater rate than the materials, then the results are fictitious because the materials you are modeling do not yet exist."

Dr. Vaziri believes the applications of his research are limitless. "Once you know how to characterize a given material, write software to simulate its behaviour and perform the necessary structural analysis, you can go into any area involving the application of new materials in all different kinds of structures, such as infrastructure renewal and upgrade for earthquakes or prosthesis design for biomedical applications."



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The Faculty of Applied Science
CEME Building
2006-2324 Main Mall
Vancouver, BC V6T 1Z4
Tel: 604.822.6413
Fax: 604.822.7006
dean@apsc.ubc.ca
www.apsc.ubc.ca

The Faculty's engineering activities include the following:

Departments

- Chemical and Biological Engineering
- Civil Engineering
- Electrical and Computer Engineering
- Mechanical Engineering
- Metals and Materials Engineering
- Mining and Mineral Process Engineering

Office of the Dean

- Business & Development Office
- Engineering Student Services
- Engineering Co-op Office
- Office of Continuing Education
- Undergraduate Programs (with the Faculty of Science)
 - Engineering Physics
 - Geological Engineering

The Faculty participates in several research centres and laboratories including:

- The Centre for Integrated Computer Systems Research (CICSR)
- The Advanced Materials and Process Engineering Laboratory (AMPEL)
- The Biotechnology Laboratory
- The Pulp and Paper Centre
- The Centre for Advanced Technology in Microelectronics

