



Photo | Kate Hollerfund

New partnership offers degree plus equity in new firm

Four enterprising graduate students could finish their Masters in Applied Science with not only a degree—but their own company to boot. But a substantial part of their equity in this potential new upstart will be “sweat equity”—and they’ll have to earn every drop.

Developed by electrical engineering professor Dr. Thomas Darcie, in collaboration with the Faculty of Business and the entrepreneurial-investment group, Wesley Clover, this partnership is a first. Wesley Clover executives approached UVic in early 2009 to brainstorm ways to involve the university in their Venture model of incubating new businesses. Darcie proposed incorporating it within a graduate program.

After the initial eight months of coursework, which is a combination of graduate-level engineering and MBA entrepreneurial studies, the students work with executives of Wesley Clover to choose a high-tech business opportunity they want to pursue. And it’s not just any opportunity, but one that’s been identified by the market.

Wesley Clover has long been using a game-changing model of creating a new product that is the solution to a real problem identified by an end user.

“It’s a pull versus push model. A customer says, “I need this,” and the students will respond with an engineered solution that fits the need—as opposed to trying to push a product from the lab to the marketplace without a firm customer,” explains Darcie.

This model almost ensures success by leveraging Wesley Clover’s established market-channel relationships and promoting partnerships between fledgling and established companies in its portfolio. Wesley Clover, whose practice it is to take a hands-on, active investor role in

working to build new companies, has successfully “hatched” numerous companies using this incubator approach.

“This is an unprecedented opportunity for students. They’re meeting weekly with Owen Matthews, executive vice president of Wesley Clover. They’re connected to very successful local business leaders who are eager to coach them. Nowhere else can a newly minted undergrad access a professional network like this,” says Darcie.

And if their product doesn’t result in a viable company? Worst case scenario says Darcie: “They end up with a graduate degree, an incredible experience and an incomparable business network. Not a bad outcome.”

The students are co-supervised by Darcie and Dr. Jens Weber, Program Director, Software Engineering. Darcie is actively recruiting new student teams for September 2010. For more information go to www.ece.uvic.ca/~eemp

Enrolled in a new entrepreneurial engineering pilot program launched last September, Torben Werner, Will Fraser, Jeff Crowe and Logan Volkers (left to right) are working as a team to bring a software product to market through a new company they will create and partially own, all while earning their masters in engineering and a diploma in business.

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In this edition of the faculty's alumni newsletter, the featured people and programs highlight the many ways in which our faculty is distinguishing itself as a professional engineering school. From the partnership with Wesley Clover to the innovative courses in design engineering, we are taking experiential learning to new levels.

Mentorship is a common theme in this issue as well. You'll read how our students are dynamic mentors to Vancouver Island youth through

community outreach with Science Venture and LEGO robotics. This positive interaction may just be the distinction that leads a young person to choose engineering—and UVic—over other options.

Many of you have gone on to distinguished careers and I am delighted that we now have a means to recognize you through an annual faculty Distinguished Alumni Award. The inaugural recipient, Catherine Roome, generously gave her time on February 3 to address three classes, from first to fourth year. Many said she was an inspirational role model.

As alumni, I encourage you to stay connected with our faculty and UVic—we are only as strong and vibrant as our people. Let us know who you are and keep in touch, either in person or through www.uvic.ca/engineering/alumni

Tom Tiedje
Ph.D., FRSC, PEng.

Simulation and engineering in the digital age

Using simulation software they helped to design during their mechanical engineering graduate studies at UVic, Ryan Nicoll and Dean Steinke, co-founders of Dynamic Systems Analysis (DSA), are coming to the aid of shellfish farmers in communities along the coastal regions of BC.

In collaboration with the Vancouver Island University's Centre for Shellfish Research, DSA is helping to design a sustainable raft to be used in shellfish farming.

Typically, rafts used by shellfish farmers are wooden, with Styrofoam for flotation. Because these rafts endure intense ocean storms, they often have life spans of only four to five years. For shellfish farmers, the risk of losing a crop is great as it takes upwards of two years for a crop of oysters to mature. The redesigned rafts aim to increase the lifespan to ten years or more meaning fewer lost crops and lower maintenance costs.

The prototypes of the raft are the end product of rigorous testing of various materials and shape configurations in virtual simulations by DSA. This simulated testing has meant an accelerated pace of development and a reduction in resources required to test designs. Once the designs are finalized, these will be provided to the shellfish industry free of charge.

Twenty years of adventure in science, engineering and technology

A generation of Vancouver Island youth has been touched by Science Venture, the UVic outreach program that brings kids aged 6–18 the joys and possibilities of science through hands-on, interactive learning.

Started in 1991 as the brainchild of five engineering students—Daryle Bowles, Graham Carter, Norm Fisher, Roland Shigas and Ted Bunker—Science Venture will celebrate 20 years of programming this summer.

"It amazes me that it's grown to what it is today," says Bunker of the program. "Back then the faculty was still new and we had all these great labs and facilities. We just wanted to share it with the community." Bunker, president of the engineering student society at the time, says the student executive thought: "Let's create an alternative to the traditional summer camp."

It was the first program of its kind in BC. And from that first summer, where 140 kids learned to love the sciences, the program has grown to reach 8,198 kids from grades 1–12 in 2009 alone.

Melisa Yestrau, Science Venture's program director, says, "We want to dispel the stereotypes of science, engineering and technology. Get kids excited about it when they're young. Show them that it's interesting, fun and relevant to everything they do in life."

Science Venture's remarkable growth would be impossible without the support of UVic's Science, Engineering and Education faculties. The program hires UVic students to teach and facilitate its various programs—from summer camps and in-school workshops, to clubs and special events. These students create dynamic, fun programming that brings the sciences to life.

The program seeks to reach not only the greatest number of youth, but also a wide diversity. Through all-girls programming, Aboriginal outreach to remote communities, and bursaries, Yestrau works to make sure no child is denied an encounter with "elephant toothpaste" in the chemistry lab or the chance to build a solar-powered car.

"We're always looking at new and innovative ways of getting kids excited," says Yestrau. To that end, Science Venture launched a "mini-med camp"—its first foray into medical science.

Yestrau says UVic students often pass her office and remark, "Hey, I did Science Venture as a kid"—proof enough that a love for the sciences has touched a generation.



Building mini cars is one of the many ways Science Venture introduces kids to engineering and design.

The "elephant toothpaste" experiment is one of the fun ways kids learn about chemical reactions.



Chairholder integrates design into engineering curriculum

One of the challenges facing future engineering graduates is that technical competency alone is no longer sufficient for professional success. Industry is telling Canadian engineering schools that graduates must combine technical excellence with a broad range of complementary professional skills.

According to the Natural Sciences and Engineering Research Council of Canada (NSERC), one of the “major gaps in Canada’s innovation system is the shortage of people with the skills and knowledge to make innovation happen. Specifically we lack design engineers. Design engineers are the enablers of innovation, and if we want to become more successful in innovation, we have to educate and train more of them.”

NSERC established the Chairs in Design Engineering Program in 2000 to improve the level and quality of design–engineering activity within Canadian universities. The first such chair awarded to UVic in 2005 is held by Dr. Peter Wild, professor, Mechanical Engineering. He is one of 16 funded by NSERC to date.

Chairholders are working to establish innovative undergraduate/graduate training programs that give engineering students the opportunity to develop the skills and knowledge they’ll need to work as design engineers in Canadian industry.

Within the first five-year term, Wild and his team have developed and implemented a number of initiatives to integrate design in the curriculum at UVic.

These include:

- a first-year course taught in conjunction with English department faculty to integrate communication skills along with engineering design
- an interdisciplinary fourth-year course in which students work in project teams and undertake industry-based design problems to find sustainable-energy-system solutions
- incentives for faculty to integrate design-based experiences into engineering science courses
- co-op work terms which focus on giving students on-the-job design experience
- design-based activities for high school outreach
- a one-day design challenge for all first-year engineering students during their first week on campus
- design-based product-development research that provides training for graduate students

“We’re reinforcing the curriculum with design experiences so that our students will be better equipped to perform design–engineering duties in co-op placements, upper-year design projects and throughout their professional careers,” says Wild. “This will result in more innovative products, processes and technologies from the companies who employ our graduates.”

In Engineering 400, Sustainable Energy Systems Design Projects, 4th-year undergrads apply their technical, creative, communication and teamwork skills to an industry project. Students form multi-disciplinary teams and work closely with sponsoring firms on projects that require the application of technical skills from more than one engineering discipline.

“This course is a great opportunity for students to experience the world of engineering design. They develop solutions for real industry-based problems and must apply their design, project management and teamwork skills. While students benefit from the mentorship of our industry partners, the companies explore ideas and solutions with our students. It’s a win-win situation,” says UVic faculty Design Engineer, Sean McConkey.

Catherine Roome, Chief Operating Officer, BC Safety Authority

As the Chief Operating Officer for the BC Safety Authority (BCSA), Catherine Roome is committed to public safety. “If it has wires, pressure or moving parts, we want to make sure it’s safe to work and play around,” says Roome.

The BCSA administers the safety regulations for boilers, electrical and gas installations, ski lifts, amusement rides, elevators and escalators, commuter rail and industrial railways.

Roome joined the BCSA in 2005 as Vice President, Engineering. Prior to this she was the General Manager responsible for BC Hydro’s thermal generating stations.

She started her career working in telecommunications, designing microwave and fibre-optic networks. Her experience includes support for development projects involving radio-network installation in Pakistan, and safety systems in Nepal.

Her work in electrical engineering also includes high-voltage substation and systems-control design. Her business experience includes strategic planning, asset management and business development.

As a graduate of the third class from the newly established faculty, Roome says, “I remember how much drive and energy there was to be world class. From my time at UVic, I learned that it takes many different perspectives to solve problems. Diversity, in all its forms, is what produces the most powerful outcomes.”



Catherine Roome, (BEng-Electrical 1990) received this year’s Distinguished Alumni Award from the Faculty of Engineering during Alumni Week at an awards ceremony February 3.

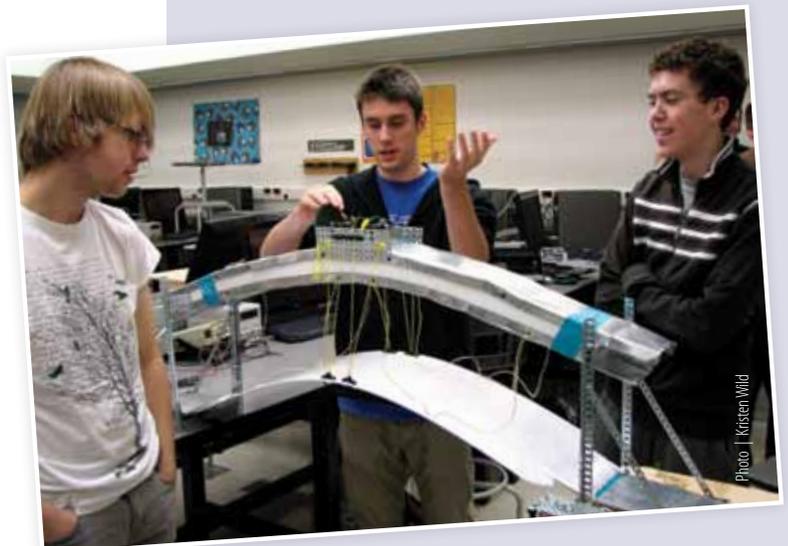


Photo | Kristen Wild

Thanks to the initiatives of the Design Engineering Chair, students are now introduced to design projects during first-year courses.



The Gemini South telescope is situated on the peak of Cerro Pachon in the Chilean Andes. (Inset) Dustin Fennell

Twin work terms at twin observatory

For one computer science major, doing a good job has resulted in an exceptional opportunity. Impressed by his work during his first co-op work term last fall at the Gemini Observatory in Chile, Dustin Fennell's supervisors invited him to stay for a second.

"It's cool to be working with scientists from so many places," says this second-year student. "People are pretty serious about astronomy here. It's interesting to see the kind of international expertise it takes to run the telescope and how it all comes together."

Built and operated by a partnership of seven countries—the United States, United Kingdom, Canada, Chile, Australia, Brazil and Argentina—the Gemini Observatory consists of twin eight-meter optical/infrared telescopes located on two of the best celestial observing sites on the planet. From mountaintops in Hawaii and Chile, the observatory's telescopes can collectively access the entire sky.

Fennell has worked on the conversion of the Gemini web pages to a new web-management system, as well as created content. He's also written applications astronomers use on the mountain—such as re-building a software tool used to look at images taken by the telescope. As part of the Science Operations team, he's had the opportunity to participate in daily operations and experience nighttime observations.

"Working in my field of study is invaluable," Fennell says. "I've learned much that will be relevant to future jobs."

Since 2002, the Gemini Observatory has employed UVic students in 24 co-op work placements in either Hawaii or Chile. Most have been physics and astronomy students; Fennell is one of two from the Faculty of Engineering to be hired since last year.

Grad student coaches LEGO robotics team to success

In classic David-versus-Goliath style, a team of kids from tiny Lasqueti Island squashed their competition in a regional LEGO-robotics tournament. The 12-member team, coached by Sarah Carruthers, placed second in the Robotics Performance category amongst 13 teams in the Vancouver Island competition last November.

Carruthers is an interdisciplinary student in Computer Science and Curriculum & Instruction and is co-supervised by Drs. Ulrike Stege and Timothy Pelton. She is currently researching the impact of computer science instruction in the elementary classroom. At home on Lasqueti Island, Carruthers volunteers at the public school, not only in her role as a Robotics Coach, but also as a science teacher and mentor.

"This is an amazing team of independent, free spirits who collaborated to build something great," says Carruthers. "They were extremely proud of their accomplishment and came away exhilarated and excited about next year's competition."

The children's school on remote Lasqueti Island, off Vancouver Island's central east coast, is in an off-the-grid community with less than 35 elementary grade school students. The island's population is around 350.

The team, aged 8-14, built a computer-controlled, three-wheeled robot out of LEGO and placed second in the performance category beating out teams from larger, urban schools.



Photo | Sarah Carruthers



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