

STUDENT SUCCESS + APPLIED RESEARCH + INNOVATION

# PRESIDENT'S REPORT 2010



AN INSTITUTE OF TECHNOLOGY COMMITTED TO STUDENT SUCCESS

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**“An investment in knowledge  
always pays the best interest.”**

BENJAMIN FRANKLIN

*On the cover: Dr. Sam Shaw, President and CEO, in front of a distillation tower in the NAIT Spartan Centre for Instrumentation Technology.*

*Above right, Dr. Shaw with Woody, a remote controlled surveillance robot. Built by NAIT's School of Electrical and Electronics Technology, the machine has impressed members of the RCMP and Edmonton Police Service.*

Fifty years ago the Alberta Government, under the leadership of Premier Ernest Manning and with a \$14-million budget, began planning a technical institute in Edmonton to serve the needs of students in central and northern Alberta.

Today, NAIT - the Northern Alberta Institute of Technology, has a reputation for meeting the needs of business and industry, learners and the provincial and national economies. Our promise to deliver “Education for the Real World” is founded on our track record of preparing our graduates to make immediate and meaningful contributions to their employers.

In a world where technology is evolving at an ever-increasing rate, it has been said that the job you may do in the future may not even exist yet. Our new Nanotechnology Systems diploma - the first such diploma in Canada - is evidence of that reality. Nanotechnology is the science of developing materials at the atomic and molecular level in order to instil them with unique chemical and electrical properties. The two-year program will provide graduates with the skills to operate systems and equipment associated with Canada's emerging nanotechnology industry.

Researchers from the School of Electrical and Electronics Technology accepted a challenge from the RCMP to develop the Rolls-Royce of tactical surveillance robots (above) for a fraction of the cost of commercially available robots - and the preliminary results are turning heads.

This summer, our first research chair, Dr. Preston McEachern, will start developing a research agenda focused on applying green chemistry and engineering principles to oil sands production as the Ledcor Group Applied Research Chair in Oil Sands Environmental Sustainability. We are planning to announce applied research chairs in the fields of natural gas, corporate social responsibility and productivity.

At Convocation this year, we bestowed honorary degrees on two of our country's innovative thinkers - Arlene Dickinson, owner, president and CEO of Venture Communications and a member of the investment panel on CBC TV's *Dragons' Den*, and Kevin Martin (Petroleum Exploration Technology '87), who skipped the Canadian men's curling team to Olympic gold in Vancouver with the guidance of longtime coach and NAIT staffer Jules Owchar.

These are exciting times for NAIT. Our budget has grown to \$300 million, yet we remain firmly grounded in our roots - the business of technology. In response to employers' demands for technical expertise paired with softer skills including communication, critical thinking, project management and leadership, we offer the Bachelor of Technology in Technology Management and the Bachelor of Business Administration, and we continue to look at other ways to meet our promise to our customers.

We are still the largest trainer of apprentices in the country and our focus remains on supporting our vision to be globally valued for student success, applied research and innovation.

I encourage you to read this report and discover for yourself the impressive things taking place at NAIT.

Dr. W.A. Sam Shaw  
President and CEO  
sams@nait.ca



## AN INSTITUTE OF TECHNOLOGY COMMITTED TO STUDENT SUCCESS

NAIT is one of the pre-eminent institutes of technology in Canada, providing practical, hands-on education in business, advanced technologies and skilled trades. NAIT has 15 locations in Alberta and offers customized training around the world in countries such as China, Cuba, Libya and the United States.

### OUR VISION

To be globally valued for student success, applied research and innovation.

### NAIT AT A GLANCE

- 250 degree, applied degree, diploma and certificate programs, including 35 apprenticeship trades
- Two unique baccalaureate programs: The Bachelor of Technology in Technology Management (BTech) – the only program of its kind in Alberta – and the Bachelor of Business Administration (BBA)
- More than 1,400 continuing education courses
- A record 7,752 graduates were eligible to receive degrees, applied degrees, diplomas and certificates at NAIT's 2010 Convocation
- 89 per cent of grads employed within six months of graduation, including 51 per cent who found jobs before graduating
- More than 156,000 alumni worldwide
- Canada's largest trainer of apprentices
- Home of the JR Shaw School of Business, a member of the Association for the Advancement of Collegiate Schools of Business – the world's premier accrediting agency for bachelors, masters and doctoral degree programs in business administration, management and accounting
- NAIT, along with its staff and students, is responsible for pumping \$500 million into the Edmonton and area economy every year. Moreover, the cumulative contribution of NAIT and its alumni to the economies of central and northern Alberta is an estimated \$4 billion annually, says a report commissioned by the Alberta Association of Colleges and Technical Institutes.
- Home of nine world-class training centres:
  1. NAIT EnCana Centre for Power Engineering Technology
  2. NAIT Gateway Mechanical Services Centre for Building Environment Technology
  3. NAIT HP Centre for Information and Communications Technology
  4. NAIT Petro-Canada Centre for Millwright Technology
  5. NAIT Sandvik Coromant Centre for Machinist Technology
  6. NAIT Shell Manufacturing Centre
  7. NAIT Spartan Centre for Instrumentation Technology
  8. NAIT Suncor Energy Centre for Piping Systems Technology
  9. NAIT Waiward Centre for Steel Technologies



### TECHNOLOGY FOR YOUR LIFE

NAIT's award-winning magazine, *techlife*, explores the everyday application of technology in a wide variety of fields from engineering technologies and business to culinary arts and applied research. Read *techlife* online at [www.techlifemag.ca](http://www.techlifemag.ca) and while you're there, subscribe to the *techlife* e-newsletter

for engaging new content, including how-to videos on everything from choosing a personal fitness trainer to selecting green building materials to preparing for a job interview.

#### Connect with NAIT online:

[www.nait.ca/socialmedia](http://www.nait.ca/socialmedia) for blogs, Facebook, Twitter, YouTube, Flickr and more!

### novaNAIT

NAIT's centre for applied research and technology transfer, *novaNAIT*, helps inventors and entrepreneurs take their ideas to market.

"Applied research is the application of new or existing knowledge to solve real-world challenges," says *novaNAIT* executive director Stuart Cullum, "and is a key element in improving Canada's productivity and innovation capacity."

With two Edmonton-area locations (main campus and St. Albert), *novaNAIT* provides an access point for industry-focused applied research. It offers business incubation, product development and commercialization services and supports applied research in areas including boreal forest reclamation, robotics, simulation, health education, machining and manufacturing, green chemistry and engineering. [www.nait.ca/novaNAIT](http://www.nait.ca/novaNAIT)

### ENTREPRENEUR IN RESIDENCE

Randy Thompson, president and CEO of the angel investment VentureAlberta Forum, brings nearly two decades of expertise to his role as *novaNAIT*'s first entrepreneur in residence, serving as mentor, adviser and teacher to select *novaNAIT* clients and NAIT employees.

### APPLIED RESEARCH CHAIRS

NAIT and the Ledcor Group have partnered to establish a \$3-million endowment and the first-ever applied research chair at a Canadian college or technical institute focused on applying green chemistry and engineering principles to oil sands production. Dr. Preston McEachern, former section head of Science, Research and Innovation with the Oil Sands Environmental Management Division of Alberta Environment, will develop applied, real-world solutions for current and future oil sands operations in the form of new processes and technologies.

NAIT is working with other business and industry partners to announce endowed chairs in the areas of productivity, corporate social responsibility and natural gas.

### NAIT SHELL MANUFACTURING CENTRE

The NAIT Shell Manufacturing Centre offers a combination of manufacturing solutions and productivity enhancement services.

The Centre introduces industry to leading manufacturing processes, such as robotic welding and rapid prototyping. In addition, the Centre provides the services and support to apply them to products in specific environments through 13 certificate programs in areas such as project leadership, conflict management and lean manufacturing.

The Centre features nine laboratories with state-of-the-art equipment and software, and smart classrooms that allow instructors to integrate technology into their instructional plans. In addition to dedicated operating staff, the Centre draws upon NAIT faculty with specific expertise – as well as contract staff from industry – to conduct training and applied research projects.

Believed to be the first of its kind in Canada, the NAIT Shell Manufacturing Centre was recognized last year by the international League for Innovation. [www.nait.ca/nsmc](http://www.nait.ca/nsmc)

### CORPORATE AND INTERNATIONAL TRAINING

For more than 40 years, NAIT has successfully partnered with industries in more than 60 countries, and is renowned for its ability to train, develop and resource a skilled workforce relevant to the needs of emerging economies. In 2009/10, NAIT's Corporate and International Training delivered 135 customized training projects in countries including Cuba, Libya, China, the United States and Canada. International training generates revenue and exports the institute's world-class curriculum, as well as its real-world philosophy and spirit of innovation. In developing countries, NAIT training helps build a skilled workforce capable of sustaining economic growth. [www.nait.ca/cit](http://www.nait.ca/cit)



### 2010 HONORARY DEGREE RECIPIENTS

#### Arlene Dickinson

*Honorary Degree, Bachelor of Business Administration*

Familiar to many Canadians as a member of the investment panel on CBC Television's popular *Dragons' Den*, Arlene Dickinson is one of Canada's most renowned marketing

entrepreneurs. As owner, president and CEO of Venture Communications, she built her company into one of the country's largest independent marketing firms. With offices in Calgary, Toronto and Ottawa, Venture Communications is a strategic and creative powerhouse and has been named three times as one of Canada's 50 Best Managed Companies. Her determination and integrity are hallmarks of a true role model.



#### Kevin Martin

*Honorary Degree, Bachelor of Technology in Technology Management*

One of Canada's most well-known athletes, Kevin Martin has an impressive record of curling achievements, including 1985 Canadian junior champion, four-time Brier champion, 2008 world champion, and

two-time Olympian, winning a silver medal in 2002 at Salt Lake City and, more recently, a gold medal at the 2010 Winter Olympics in Vancouver.

As a young curler in the 1980s, Martin was a standout student athlete at NAIT, curling under the tutelage of coach Jules Owchar. Martin graduated with a diploma in Petroleum Exploration Technology in 1987.

Although sports fans admire his extraordinary talent, it is his commitment to excellence and dedication to reaching his goals that inspires Canadians from coast to coast. NAIT could not be prouder of alumnus Kevin Martin.

*Left, Habitat for Humanity projects provide Architecture Technology and Interior Design Technology students the opportunity to develop skills while helping the less fortunate.*

## HANDS ON FOR HUMANITY

**N**AIT Architectural Technology and Interior Design Technology students are getting some first-hand experience in the construction business by helping Habitat for Humanity build homes for the less fortunate.

This is the first year the volunteer effort was built into the curriculum for both programs. All 133 students spent 32 hours at various Edmonton Habitat sites, helping install vapour barrier, drywall and baseboards and doing other tasks like painting.

As part of their programs of study, students take detailing classes where they learn “on paper” the theory of how construction projects come together. The Habitat experience gives them the hands-on application they need, says Kevin Porter, Chair of Environmental Design programs at NAIT, “and helps them see what their drawings can become in the real world.”

Megan Ellard, 20, a first-year Architectural Technology student, spent a few days building a new storage room for the Habitat ReStore – a retail outlet that sells new and used building supplies.

“We put up the whole room,” says Ellard. “It was an awesome experience. I learned more volunteering on site as opposed to just sitting in class reading from a textbook. And it was good to know you’re helping other people that need it.”

Tyler Shykowski, 21, another first-year Architectural Technology student, put up the drywall inside some half-duplexes. What made the experience even better, says Shykowski, was meeting the homeowners in person.

“That was really cool. He said a big thank you and couldn’t say enough about our efforts.”

Habitat for Humanity says it has thousands of dedicated volunteers but finding volunteers in the cooler months can be challenging. Collectively, NAIT students contributed more than 3,700 hours of volunteer labour over the winter. “The students help us immensely,” says Angela Robichaud, volunteer manager with Habitat for Humanity Edmonton. “A massive amount of work gets done during the time they are with us, and we are thrilled to be a part of their curriculum.”

In the fall, a new program will start with Habitat for Humanity where first-year students will design a collection of houses for the charitable organization and the following year they will return to various sites to help build those same homes. Fittingly, the program will be known as “The NAIT House.”



**WEB EXTRA**

Watch the refurbishment of the Avro Arrow model, and see the finished plane pulled from the hangar.

[techlifemag.ca/arrow.htm](http://techlifemag.ca/arrow.htm)



*Left, a full-scale model of the Avro Canada CF-105 Arrow, refurbished by volunteers (below) from NAIT's Aircraft Skin and Structure Repair program.*

## FOR THE LOVE OF A LEGEND

Students and instructors from NAIT's Aircraft Skin and Structure Repair program lent their expertise last summer to help the public imagine what might have been in the history of Canadian aviation. Nearly 20 students logged hundreds of hours to help refurbish a full-scale model of the legendary Avro Arrow.

The newly-restored aircraft was unveiled July 10, 2009 at the Reynolds-Alberta Museum in Wetaskiwin as part of the 100<sup>th</sup> anniversary of powered flight in Canada. Incidentally, 2009 also marked the 50<sup>th</sup> anniversary of the cancellation of the Arrow initiative.

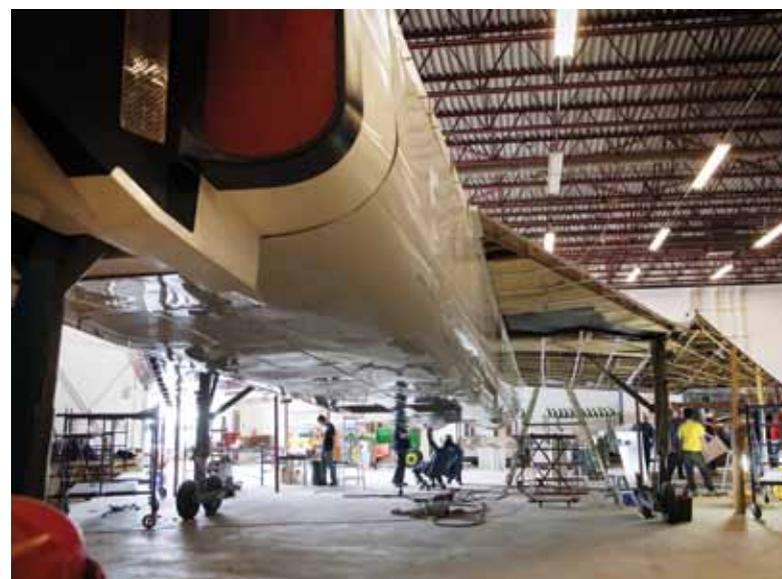
"When we started, many of the students didn't know about the Avro Arrow, but once they did, they all got excited to work on it," says Dave McIntosh, chair of the Aircraft Skin and Structure Repair program. "It took me all of two seconds to say yes to this," he adds. "I'm so proud of the work we've done."

Hailed as the crowning achievement of the Canadian aerospace industry in the 1950s, the aircraft has garnered legendary status. With only six prototypes built and flown between 1958 and 1959, the Arrow was one of the fastest, most sophisticated fighters in the world. The project was cancelled in February 1959 by Prime Minister Diefenbaker and all prototypes and blueprints were destroyed. The termination of the project was attributed to skyrocketing costs and the belief that air defence could be better handled by unmanned missiles.

Ryan Sears, 19, put in 50 hours on the project. "This is Canada's aviation history," he beams. "We're taking what we learned at NAIT and using it in a real-world setting. There were nails and screws sticking out. It was basically a big mess."

The volunteers logged nearly 500 hours to completely recover the entire Arrow Mark 1 model with 4,320 square metres of aluminum sheeting.

Originally built by local Arrow buff Allan Jackson in the 1990s, the replica was used by CBC in a 1997 miniseries starring Dan Aykroyd. After making the rounds at air shows, it was returned to Wetaskiwin in need of a complete overhaul. With little funding and a limited number of volunteers, the model collected dust for over a decade until the museum decided to return it to its original glory.





## QUEEN OF THE COURT

**D**ale-Marie Cumberbatch is the first one on the court and the last to leave – and that dedication is netting results.

Entering her fifth and final season of college ball this fall, the captain of the Oaks women's basketball team has had a record-smashing career.

The five-foot-11 Cumberbatch has broken several Alberta Colleges Athletic Conference records – total number of points per season, most two-point field goals in a season, most free throws in a season and most successful blocks in a season. And this year, she bested the career-scoring record she set last year, and in the

process may have set a new national record with 2,136 career points after four seasons.

Going into her final season, Cumberbatch is looking for the big win that has so far eluded the Oaks women's basketball team. "My goal for this year is to win," she says. "I want to make playoffs and win, and go to nationals and win."

Cumberbatch, who already holds NAIT diplomas in digital media and computer networking, says she'd like to play basketball in Europe after she finishes her Bachelor of Technology in Technology Management degree in spring 2011.



*Far Left, Oaks women's basketball team captain and multiple record-holder Dale-Marie Cumberbatch has set her sights on victory at the nationals.*

*Left, undeterred by a brittle-bone disease, NAIT Oaks setter Austin Hinchey is a leader on and off the volleyball court.*

## INSPIRED PERFORMANCE

**N**AIT Oaks' setter Austin Hinchey says he's expected to play on disabled teams, but surprises a lot of people by playing college volleyball.

Born with a brittle-bone disease, the athlete had broken his leg four times by the time he was 10 years old. Just before Grade 6, Hinchey had his left leg amputated below the knee – a decision he made so he could keep playing sports. Now, he wears a prosthetic limb and a high-performance foot.

Despite Hinchey's occasional need for added recovery time following training and instances when he was uncertain whether liners for his prosthetic limb would arrive before game time, coach Simon Fedun says the natural-born leader lets on little about the challenges he faces to play. "The way he carries himself – it's just an inspiration to be around him."

This past season was one of bonding and growth for the young team, and Hinchey is eager to get back on the court. "It feels more like a team I belong to," he says.

Hinchey, who is entering the second year of his Bachelor of Business Administration, has played on the national Paralympics team since he was 16.



## FRIENDS OF THE FOREST

This growing season at six well sites in northwest Alberta, researchers are testing soil preparation techniques and native plants for use in reclaiming abandoned conventional oil and gas wells, as well as associated service roads and pipelines.

The Boreal Reclamation Program, based at the novaNAIT Boreal Research Institute in Peace River, 500 kilometres northwest of Edmonton, brings together academics, government, industry, First Nations and Métis communities to identify best practices in restoring abandoned well sites in the boreal forest to a state similar to their original condition.

The boreal region covers 58 per cent of Alberta, is a vital wildlife habitat, a major carbon sink – and a source of economic opportunity. Construction of 1.4-hectare well sites, service roads and pipelines leads to the removal of vegetation and topsoil. With 49,744 abandoned oil and gas wells in the boreal forested area, the need for reclamation is significant.

“Well sites are scattered throughout the boreal forest,” says Hugh Seaton, manager of the novaNAIT Boreal Research Institute. “While these conventional, smaller well pads have a less intensive industrial impact than open pit mining, they have a cumulative effect – a fragmenting of the forest.”

Not only is there a backlog of sites in need of reclamation, but industry now has to meet tougher provincial criteria for well sites in forested areas. Alberta reclamation standards call for the use of native forbs, shrubs and trees; the previous requirement was a single grass cover.

In the long-term, the researchers hope to be able to transfer successful reclamation practices to Canadian boreal regions outside Alberta and to adapt the findings to other types of forests.

Shell Canada is an important partner in the project, having committed \$520,000 in total towards the program. It will contribute \$76,000 annually for the next five years in addition to the \$140,000 it has contributed previously. It is also hosting this season’s field trials at its Peace River lease area.

“Shell takes a life cycle approach when planning its development activities,” says Trevor Hindmarch, Shell Canada environmental team lead. “That’s why we believe it is important to fund research projects like this that help us identify the best practices to use to return the land to a state as close as possible to what existed prior to development.”

*Above, the novaNAIT Boreal Research Institute is leading reclamation efforts in northern Alberta’s boreal forest.*

### NSERC AWARDS NAIT RESEARCHER

NAIT faculty researcher Dr. Ron Currie was awarded a \$125,000 NSERC grant this year to develop technology to analyze air quality more quickly - which could someday save lives in the event of a chemical attack or allow a doctor to analyze a throat swab in her office for instant results.

The institute was one of the first two colleges and technical institutes in Canada to be successful in NSERC’s Idea to

Innovation grant program. Historically, this faculty funding is dominated by universities.

Reviewers with NSERC (the Natural Sciences and Engineering Research Council of Canada) noted Currie’s idea would “mark a significant advance in existing technologies” that could benefit many businesses and lead to great commercial opportunities.

*Left, chair of applied research and curriculum development Mark Archibald with technologists Konrad Schmidtke (far left) and Maysam Saleh (left) and Woody, a remote controlled surveillance robot.*



## RECONNAISSANCE RESEARCH

Tactical policing is about to get a lot speedier and less expensive thanks to a surveillance robot built by researchers from NAIT's School of Electrical and Electronics Technology (SEET).

The four-wheel drive device reaches speeds of 16 km/h, turns 360 degrees on its axis, climbs curbs, turns heads and could save lives.

Last fall, SEET accepted a challenge from the RCMP to build Woody, the Rolls-Royce of police surveillance robots for the fraction of what similar units currently cost.

With financial support from SEET, the Association of Alberta Colleges and Technical Institutes and novaNAIT, the institute's centre for applied research and technology transfer, a team of NAIT researchers got to work. "We essentially started from scratch and their recommendations drove our design process," explains Mark Archibald, chair of SEET's applied research and curriculum development.

Seven months into the ongoing project, members of the RCMP and Edmonton Police have been invited for a test drive. Taking turns operating the robot's video game remote control, they extend the 2.5-metre zipper mast for a bird's eye view and easily maneuver the compact robot through busy NAIT hallways, where it opens heavy doors without hesitation.

"When we're responding to a situation where there may be a chemical, biological, radiological or nuclear threat, using a robot is ideal," says RCMP Cpl. Greg Baird. "And, the surveillance capabilities will give us a better understanding of a tactical situation and help us make critical decisions without compromising human life."

The officers decide to challenge the robot to one last task – climbing a curb. Archibald is a little uneasy, as he hasn't tried this yet. It takes a couple of attempts, but Woody doesn't disappoint. Archibald beams like a proud papa.

"I'm thoroughly impressed," Baird says. "This is something that we could use right now. I can't wait to see the final product."



*Left, Woody can reach speeds of 16 km/h and climb curbs, making it a tactical asset in police activities.*

**WEB EXTRA**  
Watch the RCMP and Edmonton Police take Woody (named for his wooden chassis) on a test drive.

[techlifemag.ca/robot.htm](http://techlifemag.ca/robot.htm)



*Left, a study supported by novaNAIT identified the Bernese mountain dog as a top pick amongst pet breeds, compared to (bottom from left to right) the Doberman pinscher, cavalier King Charles spaniel and miniature pinscher.*

## A QUESTION OF CANINES

When it comes to picking a pet, looks matter. Researchers from NAIT and the University of Alberta teamed up to determine which breed of dog people thought would make the best companion animal and how different breeds influenced interaction between strangers.

In the first phase of the research, which was supported by NAIT, the Alberta Association of Colleges and Technical Institutes and the University of Alberta, the researchers interviewed 295 people along Edmonton's busy Whyte Avenue.

Armed with photos of four breeds – Doberman pinscher, miniature pinscher, Bernese mountain dog and a cavalier King Charles spaniel – they asked people which breed they thought would make the best pet. Next, they took the dogs out and observed people's reactions.

The Bernese mountain dog lapped the other breeds as the top pick of 55 per cent of participants. Yet only 24 per cent knew what breed he was. Compare this to the most unpopular breed, the Doberman, which 77 per cent of participants recognized, but only nine per cent would choose as a pet.

"Unfortunately, it seems that many pets are being chosen based on looks – not on the actual characteristics of the breed," says Linda Glasier, associate chair with NAIT's Veterinary Administrative Assistant program. "And, it seems like some breeds are unfairly getting a bad rap."

What really surprised researchers was that 66 per cent of those surveyed said they would trust a stranger with a dog more than one without a dog.

"Trust is a very strong word," adds Glasier, "and it could unfortunately be misplaced."

The results of this research, originally initiated by Glasier's daughter Alicia, a U of A student, have generated many new areas to explore, including the impact of variables such as ear shape and the presence of white and black in a dog's fur, and why people are more likely to trust strangers with dogs.



*Left, high school students at the Skill Centre, a joint project of NAIT and Edmonton Public Schools, get industry experience to smooth their transition into post-secondary education.*



## SMOOTHER TRANSITION

Edmonton Public Schools and NAIT are offering a new route for students planning their journey from high school to post-secondary education.

The Skill Centre is a pilot project funded through an Innovation Grant from the Government of Alberta. This February, it opened its doors to hundreds of local high school students interested in getting hands-on Career Technology Studies training.

Housed in the old terminal building of the City Centre Airport across from NAIT, the Skill Centre gives high school students real-world experience in several career fields, including culinary arts, materials manufacturing and aircraft maintenance.

For one semester, students spend half of each day getting hands-on experience on industry quality tools and equipment.

“We want to make the journey from high school to post-secondary much less turbulent. Graduates from the Skill Centre will hopefully get advanced standing in the equivalent NAIT program and could earn some advanced credits,” explains Brian Andrus, project lead of the Skill Centre.

NAIT has donated some of the equipment for the initiative, including an aircraft from the Aircraft Skin and Structure Repair program, and provided expertise from a variety of programs.

The Skill Centre’s curriculum is based on an innovative five-year collaborative research initiative which provides a framework for the evaluation, implementation, growth and sustainability of current and future career-focused education in the K-12 system.

The approach is designed to give students a thorough understanding of a career field and be flexible and adaptable to other educational jurisdictions in Alberta and beyond.

“They’ll be able to make more informed post-secondary decisions, and, I believe, the student retention will be greater,” says Andrus.

To complement the project, NAIT has developed a Skill Centre in the 3-D virtual world of Teen Second Life.

*Left, Bachelor of Technology in Technology Management students (from left) Katrina Lee, Igor Teterski and Dean Vitisin have turned their Capstone Project into a business.*

*Bottom left, a hand-held radio frequency identification (RFID) device; bottom right, the team applies RFID technology to asset management at a fabrication shop.*

## STUDENT ENTERPRISE

When the three students working to implement a radio frequency identification (RFID) system at an industrial fabrication facility began the project, not one thought they'd finish as business partners. The trio has set up an RFID consulting company, Triple-i Tracking Technologies Inc., to implement customized asset tracking systems for clients.

However unexpected the prospect, faculty with the Bachelor of Technology in Technology Management (BTech) say it demonstrates key outcomes of the Capstone Project, which is not only about identifying technological solutions to real-world challenges, but about teamwork between people with different backgrounds, technical training and philosophies.

"You come to the realization of what kind of advantage you have as a trio," says Dean Vitisin, who has a Mechanical Engineering Technology diploma from NAIT. Igor Teterski has an engineering degree from a university in Belarus and Katrina Lee, originally from Hong Kong, is a NAIT Computer Systems Technology graduate.

The only program of its kind in Alberta, the BTech provides graduates with the technical and leadership skills they need to take on management and supervisory roles.

The major focus of the fourth year, the capstone project allows students to integrate and apply the skills and knowledge acquired in the program. It is completed in conjunction with a sponsor from industry, government or other sectors.

This year, there are 11 capstone projects underway, with teams working to restart a remote chemistry lab, develop a salinity sensor prototype for marine aquariums and test nitrous oxide levels in waste water.

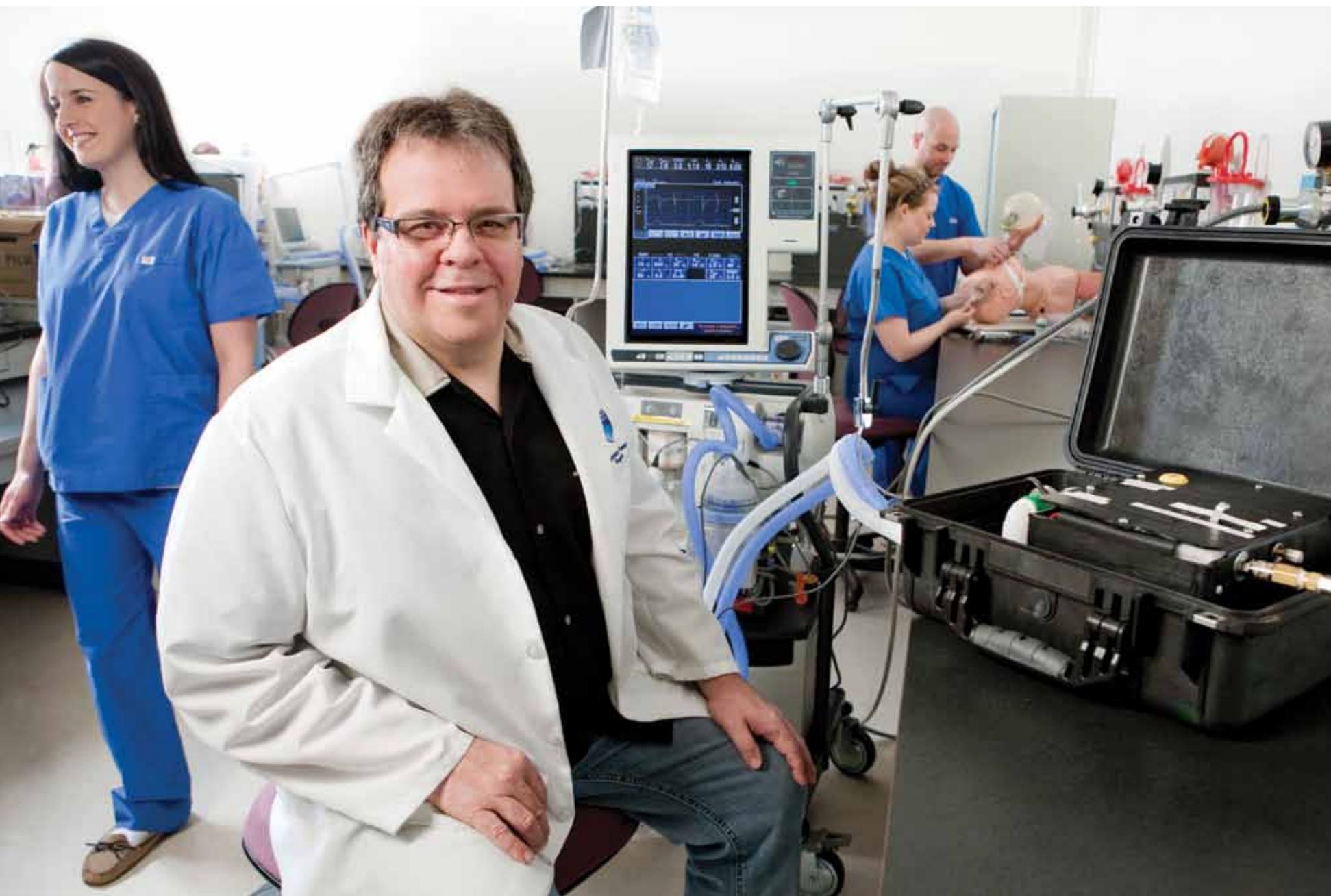
PCL Industrial Constructors Inc. sponsored the RFID project. PCL officials asked the students to propose a system that would give the company the ability to locate fabricated pipe – which ranges in size from 1/4 inch to 72 inches in diameter – in and around their facility, and to know with 100-per cent certainty which pipes have been shipped from the shop. The RFID system would replace the use of paper tags and barcodes, which can be cumbersome.

Jamie Nelson, PCL material control supervisor, says researching RFID technology with the students has been eye-opening. "From what we have seen to date, we are pleased and excited to see where this could take us as a company."

Encouraged by the program's associate chair, Dr. Klay Dyer, and with mentorship and advice from a student business club and *novaNAIT* entrepreneur in residence Randy Thompson, Vitisin, Teterski and Lee are planning to stake their place in an industry projected to grow to \$26 billion by 2016, up from just \$2.6 billion in 2006.



*Left, instructor Ian Pappin with the automated test lung he invented to streamline respiratory therapy training.*



## BREATHE EASIER

Instructor Ian Pappin wanted to create a real-world scenario for training Respiratory Therapy students to use a ventilator. So he invented an automated test lung to simulate a patient's actual breathing.

A black metal box with a few switches, the alpha prototype looks nothing at all like a patient's lungs, but it certainly behaves like them. Pappin can adjust the settings on the device, which operates on compressed air and connects to a ventilator, to simulate healthy or sick lungs.

"What this teaches is not only the technical aspects of running the machine, but how to respond to a breathing patient," Pappin says, adding that the automated test lungs give students experience they would otherwise only get in a hospital, with a real patient. "If we could simulate it, it takes away that anxiety in an emergency situation."

With a manually operated lung simulator, Pappin has to physically trigger breath – "I can do that with one or two students, not 20" – or students have to take turns triggering breath while their classmates operate the ventilator.

Pappin's automated test lung-patient simulator is one of 95 prototypes developed through *novaNAIT*, the institute's centre for applied research and technology transfer. Since launching its first product development program in 2006, *novaNAIT* has completed \$1.4 million in product development work with 125 companies and individuals.

"A knowledge-based economy needs to continuously create and commercialize new ideas and technologies to remain strong and relevant," says Stuart Cullum, *novaNAIT*'s executive director. "Through work with clients like Ian, we are helping build innovation capacity in Alberta."

By next fall, Pappin would like to have a half-dozen automated test lung prototypes in the Respiratory Therapy lab, allowing students to not only train on the devices, but to evaluate the test lungs as he prepares to make a production-ready model that could be sold to other post-secondary institutes and even hospitals.

### PRODUCT DEVELOPMENT SERVICES AVAILABLE FROM NAIT

- Designing and developing prototype devices, systems, processes and products
- Analyzing, testing, troubleshooting and evaluating new technologies
- Assessing and commercializing new technologies and products

[www.nait.ca/novanait](http://www.nait.ca/novanait)



*Left, two lung simulators commonly used today. Manually operated and non-adjustable, the units can make training large groups difficult.*



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