Saskatchewan Manufacturing

Innovation. Opportunity. Growth.

Saskatchewan possesses a broad and thriving economy, and its manufacturing sector is a major contributor. Our manufacturers, dispersed widely across the province, export approximately 80 per cent of what they produce. This represents a vast catalogue of products including machinery, transportation and industrial equipment, wood products and chemicals, with emerging clusters such as aerospace and defence, automotive accessories, and electronics and instrumentation. Saskatchewan Manufacturing Week (November 28–December 2) acknowledges our manufacturers and their continued success stories.

Building Character: Saskatchewan's Manufacturing Sector

Saskatchewan continues to lead the country in economic growth, even at a time when the economic prosperity of world is in question. Our economy is diverse and robust; our fiscal regime is sound; and the Saskatchewan brand is increasingly well-known in markets throughout the world.

Our provincial manufacturing sector is driving the success of the Saskatchewan brand. We have long been a province of exporters, since the early days of pioneers and homesteads. Today, our manufacturers represent an industry of 30,500 employees and $10.9 billion in shipments in 2010, exporting goods to 112 different countries.

As we enter Saskatchewan Manufacturing Week and acknowledge the people and businesses behind this thriving economic sector, it is worth asking: what are the characteristics that give Saskatchewan manufacturing the strength that it enjoys?

There are several key qualities worth examining and which are featured in the pages which follow.

Saskatchewan is developing and utilizing world-class technology – the brainchild of private sector firms combining their efforts and working together to create solutions to market demands, or create new markets themselves.

There is a profound emphasis in Saskatchewan on the future. Nowhere is this more evident than within the doors and beamlines of the Canadian Light Source, Canada's national synchrotron facility. It is a magnet for international investment and the pursuit of innovation, and is but one of the venues where we are aggressively exploring new frontiers in science.

There is our strong and increasingly well-educated workforce – backed up by educational institutions supported by private sector partnerships which are stimulating growth and addressing the labour needs of tomorrow's job market today.

Lastly, new manufacturers in Saskatchewan are increasingly entrepreneurs who are seizing the new opportunities being discovered here. With nearly a third of the province's manufacturing taking place outside of Regina and Saskatoon, Saskatchewan has a well-dispersed industrial base that is exploring opportunities in every corner of the province.

Manufacturers are not only some of the leading corporate citizens of our province, but their work permeates the fabric of our communities from border to border, helping to define their character – and their future. Read on and discover why.

Hon. Jeremy Harrison
Minister of Enterprise
Minister Responsible for Trade

Future of Manufacturing Underway at Canadian Light Source

Consider the tire pressure sensor on newer vehicles and then think smaller, much smaller, and you'll begin to get an idea of one way a new beamline at the Canadian Light Source (CLS) synchrotron in Saskatoon might be used in the future of manufacturing.

"Those (tiny) sensors are very much the kind of things you could see being developed using SyLMAND (Synchrotron Laboratory for Micro and Nano Devices)," says Jeff Cutler, director of industrial science at CLS. "Then you can start putting them pretty much anywhere in a vehicle and understanding issues before they become serious issues."

SyLMAND is one of a number of beamline programs used by scientists at CLS. As Canada's first X-ray lithography facility, it offers leading-edge technology that allows for the fabrication of high-quality polymer and metallic microstructures that can be used in a wide range of applications by many industries, including automotive, defence and aerospace.

For example, says Cutler, communication and aviation electronics contractor Rockwell Collins has used SyLMAND to pursue its interest in "squeezing down the size" of radio frequency devices for aircraft avionics packages.

"If you can start making these things smaller and lighter, you can start adding more things to the aircraft or you can make it go higher or faster," says Cutler.

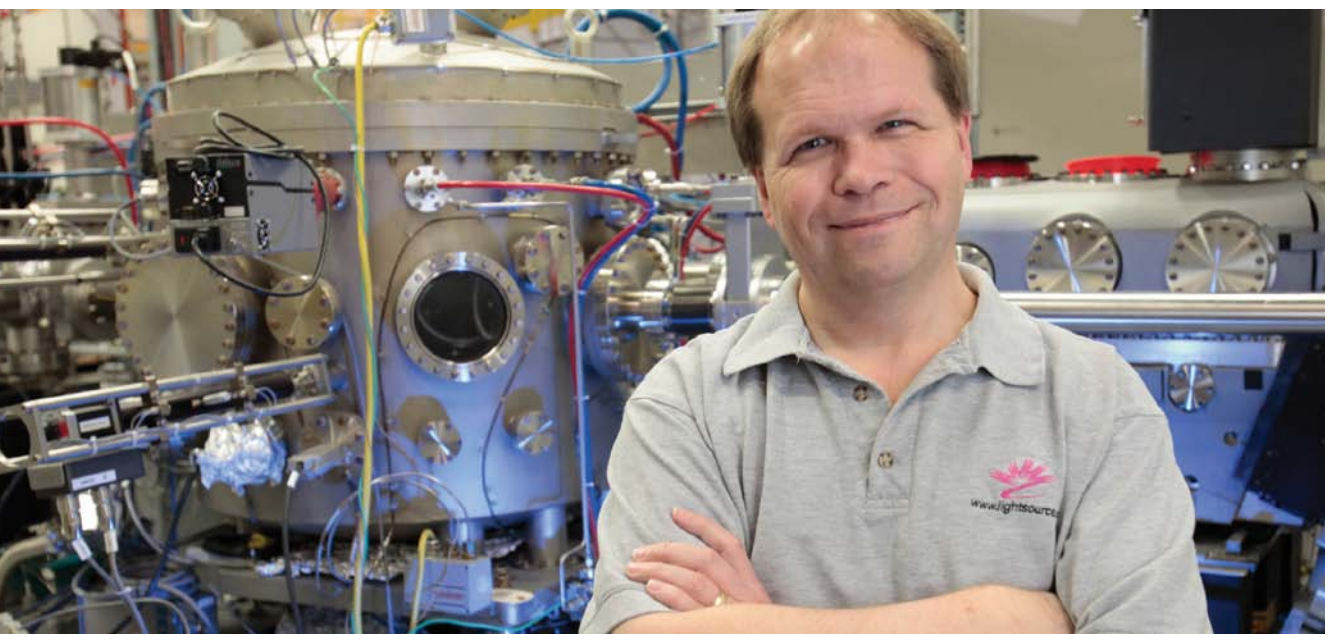
Cutler is also involved in assembling partners for the Canadian Innovative Materials Research Centre (CIMRC), a consortium of worldwide industry, Canadian university research groups and governments who will use the CLS to create new coatings, finishes, films and alloys for industry members in the aerospace, automotive, energy and other sectors. While CIMRC was initiated by the aerospace industry, Cutler foresees a broader role for the organization.

> "If you can start making these things smaller and lighter, you can start adding more things to the aircraft or you can make it go higher or faster."

"We're trying to develop what I would describe as more of a multi-sectored centre that doesn't just impact aerospace but also plays a role in advanced manufacturing in the auto sector, in agriculture, in mining."

While Cutler says the nascent CIMRC consortium and the SyLMAND facility operate at arm's length, he sees a strong likelihood of collaboration in the future. SyLMAND and other tools at CLS will never go too much beyond fundamental research, he explains. But CIMRC can serve as an overarching bridge among all stages of development of new technologies or new pieces of infrastructure or equipment. And once a promising technology is identified – perhaps a new sensor for an aircraft or new material for an aircraft wing – the CLS will have partners who can help advance it through to the manufacturing stage.

"It becomes a question of who can help move it further along the production line so that it can actually roll out the front door," says Cutler. "And that's where an organization like CIMRC can bring all those pieces together."



Jeff Cutler, Director of Industrial Science, Canadian Light Source

Photo Credit: Keith Moulding

Saskatchewan is expected by various economic forecasters to be among the nation's top provinces for growth this year and next. Much of this is due to our manufacturers, which are keyed to pursue market opportunities in innovative and, if required, collaborative ways. This is the domain of Enterprise Saskatchewan, the province's economic development agency—helping business do business in one of the most accessible, opportunity-rich and competitive investment climates anywhere on Earth. Assisting in bringing organizations together to remove barriers to growth is just one example of what Enterprise Saskatchewan does.

COLLABORATING FOR SUCCESS

When four Saskatoon manufacturing companies worked together to create a 200-tonne potash mining machine, they generated opportunity for all where there was none for each.

"We're ardent competitors when it comes time," says Tom Foster, president of Industrial Machine and Manufacturing Inc. (IMM), one of the participating businesses. "But at the same time, when we recognize a project that might be beyond our individual scope or capacity, we reach out to each other to see if we can fill the void."

The opportunity to collaborate on the potash miner arose after the traditional vendor for a Saskatchewan potash company offered a production date that wasn't acceptable. Foster says mining company officials could have gone overseas to choose an original equipment manufacturer (OEM), but that didn't appeal to them. Knowing the reputation of local manufacturing companies as major service providers for the industry, the potash company officials instead approached Francis Nagy at Deca Industries in Saskatoon to see if he was interested in the work. Foster says Nagy told mining officials he couldn't take on the job, alone. He told them he'd talk to Foster to see whether IMM would be interested, and from there, says Foster, the duo expanded to a foursome with the addition of Continental Mine & Industrial Supply and Saskatoon Metal Manufacturing Ltd.

"We were very interested in doing it, but we didn't want to jeopardize some of our existing work," Foster says of IMM's decision to come onboard. "Getting more parties involved allowed us to meet the requirements of the customer, which was completing the machine on time and on budget, while allowing us to maintain our other workload. So we weren't jeopardizing our company after completion of the project."

Mine officials provided a partial design for the mining machine. Then, the four-company collective completed the design work and agreed Nagy would be their primary contact person for the mining company. The four collaborators met weekly together and monthly with their customer to ensure the project stayed on target. It was completed on time and on budget, and the group now has built a second potash miner.

Foster says the four companies are optimistic there will be more opportunities to work together on big projects. But he admits he's a little concerned some mining companies new to the Saskatchewan scene may view Saskatoon manufacturers as service providers only, rather than OEMs as well.

"We want to convince some of the multinational mining companies that are quite attracted to Saskatchewan right now that we have ability to do this, that we will work together, and that they don't need to be sourcing or bringing in a supply chain with them," says Foster. "We've got a very strong one right here."

He says Saskatoon is lucky to have one of the world's premier resources located only an hour's drive away. But he adds the potash mining industry is fortunate, as well, to have access to local manufacturers who've been honing their skills and developing their knowledge of potash mining for half a century.

"It's very much a hand-in-hand thing," says Foster.

High-Clearance Trucking Corridor Spurs Growth

Collaboration among Saskatchewan manufacturers, Enterprise Saskatchewan, governments, SGI and SaskPower has led to the establishment of the province's first high-clearance trucking corridor for moving oversized loads on provincial highways. The corridor will stimulate regional growth by providing reliable, efficient and low-cost routes to shippers of items such as over-dimension equipment and machinery.

But this east-west corridor across central Saskatchewan – and future ones currently under discussion – also should help bypass the kinds of problems that can arise when "megaload" shipping is done on an ad-hoc basis. Costly delays and legal challenges surrounding the shipment of oversized loads from South Korea to the Alberta oil sands, via the United States, is a case in point.

> "We're ardent competitors when it comes time, but at the same time, when we recognize a project that might be beyond our individual scope or capacity, we reach out to each other to see if we can fill the void."

The Korean equipment modules, destined for Imperial Oil's Kearl Oil Sands Project, were to dock on the northwest coast of the U.S. and be transported by highway across northern states and up into Alberta from Montana, according to news reports. But the plan to move the giant modules on a two-lane highway through environmentally sensitive areas brought legal challenges from local government and environmental groups. Recent reports indicate some of the modules have been disassembled and transported into Alberta in smaller loads, while others remain stalled in legal limbo south of the border.

Greg Bedford, a spokesperson for Babcock and Wilcox (B&W), which uses Saskatchewan's new corridor to ship giant boilers out of its Melville facility to oil sands customers in Alberta, says the situation in the U.S. illustrates the importance of "what Saskatchewan has done and other jurisdictions have not."

"Governments are large operations and it's often difficult to get decisions made," Bedford said of discussions leading to establishment of the corridor. "That wasn't the case here."

The high-clearance corridor runs from Melville to Rosetown on Highway 15 (including short sections of Highways 6, 20 and 4), and from Saskatoon to the Alberta boundary on Highway 7. Power lines crossing corridor highways have been raised to accommodate higher loads or moved underground. Highway work, including rebuilding and strengthening 57 kilometres of Highway 15, is scheduled for completion in 2015.

Bedford says the corridor not only circumvents the kinds of problems encountered in the U.S., it allows B&W to build more and larger components at Melville, ship them to Alberta at lower rates, and sustain its Saskatchewan workforce.

"We made a fairly significant investment (at Melville) in retooling and reconfiguring, capital upgrades that expand the capability there," says Bedford. "We only did that on the basis we'd be able to ship large, modularized components to the oil sands."

Parties shipping oversized goods typically work with the province, municipalities and SaskPower to arrange routes and determine which power lines have to be temporarily cut or raised. Using the corridor reduces the work involved in planning these moves and the costs to shippers who use it. The latter now pay a permit fee significantly lower than the costs associated with the previous method of paying for lifts and cuts.

Donavon Nelson, a SaskPower supervisor who oversaw the utility's work on the corridor, estimates SaskPower would tie up as many as 50 staff raising power lines, or cutting and reconnecting them, on a typical three-day move of oversized equipment from Melville to the Alberta boundary. Nelson says SaskPower fully understands this is a cost of doing business – the utility accommodates about 3,000 high-load moves each year. But with the corridor in place, the utility can spend more time and resources focusing on its core business of maintaining power lines and building new ones.

"In this day and age, with all that's happening in the province, we could be putting all our resources into new-connect activity, notwithstanding the need to keep up with maintenance activities," says Nelson.

SaskPower continues to collaborate with industry and other agencies on future high-clearance corridors in the province. And while Nelson says specifying proposed routes is premature, he says it's apparent the province needs a north-south corridor and an east-west one for southern Saskatchewan.

"There's huge growth on the industry side in Saskatchewan, and we need to be able to help people out in moving these big loads to and from their locations," says Nelson.

Tom Foster, President, Industrial Machine and Manufacturing Photo Credit: Keith Moulding

CALENDAR OF EVENTS

MONDAY, NOVEMBER 28

- 11:30 a.m. – 1:30 p.m.

Capt. Mike Abrashoff Luncheon

Queensbury Convention Centre, Regina

TUESDAY, NOVEMBER 29

- 11:30 a.m. – 1:30 p.m.

Capt. Mike Abrashoff Luncheon

Prairieland Park, Saskatoon

WEDNESDAY, NOVEMBER 30

- All Day Event for Students

SIEC Spotlight on Careers in Manufacturing

Morning:

– *Electronics Technician and Electronics Systems programs at SIAST Kelsey Campus*

– *SED Systems*

Afternoon: *College Mobile*

THURSDAY, DECEMBER 1

- 9:00 a.m. – 10:00 a.m.

Saskatchewan Manufacturing Week Press Conference at JNE Welding

3915 Thatcher Avenue, Saskatoon

- 10:00 a.m. – 3:00 p.m.

Manufacturing Sector Team Meeting (closed)

The Saskatchewan brand is a global one. Over 100 countries imported made-in-Saskatchewan goods in 2010, with the top 10 markets being the United States, Australia, Thailand, Kazakhstan, Russia, China, Niger, Ukraine, France and Germany. The United States accounted for 90 per cent of trade within the top 10 markets and 86 per cent of overall exports for the sector.

WORLD-CLASS TECHNOLOGY

Business Centre Connects Global Buyers to Ag Equipment Exporters

Rob O'Connor, Manager, International Business Centre

Photo Credit: Keith Moulding

For Saskatchewan's agricultural implement manufacturers, who already account for about half of Canada's farm equipment exports, the future is no longer in high tech. It's in higher tech.

"What we're seeing is a real growth in precision farming," says Rob O'Connor, manager of the International Business Centre (IBC) in Regina. "And precision farming is pretty amazing."

O'Connor says global positioning system (GPS) technology has been used in agriculture for about 15 years. Now, GPS implementation is moving in innovative and exciting directions.

For example, he says, some of today's seed monitoring systems can so precisely place fertilizer that roots of a germinating seed can get appropriate nutrition for each stage of growth. And with GPS technology, a farmer can see which area of his crop needs more fertilizer.

"You could own 10,000 acres, but you may have only 100 that need something different. Now, you can monitor that and adjust accordingly. And the machines, even though they're 72 feet wide, are able to be that precise."

It's this kind of precision that can generate "huge" savings on input costs, whether in fuel, fertilizer or a combination of both, he says. And it's the kind of technology that's becoming ever more attractive in places like Kazakhstan, home to one visitor to the centre who owns 70,000 hectares of land that encompasses two towns.

"Basically, he employs everybody in those two towns to run his farms, and he can sit in his office and watch everything by GPS."

O'Connor gets a face-to-face view of the international market several days every year when the IBC operates in concert with the Western Canada Farm Progress Show, for which he also is manager. One day before and three days during the farm show, the IBC operates on the second floor of the Co-operators Centre, serving as a place where exporters can meet with international business delegates.

"We have office space and computers where people can access their e-mails, communicate back with the head offices in whichever country they're coming from," he says. "There's a whole lot of business that we support with the centre."

O'Connor says 586 international buyers from 46 countries attended the 2011 show in June. Of those buyers, 85 responded to a survey asking the value of purchases they intended to make and the total was $143 million. The comparative figure for 2010 was $139 million.

During the rest of the year, the IBC functions as a program that encourages, co-ordinates and accommodates future visits by international buyers. The IBC has a database of about 1,200 international companies who come to the show to do business. Staff keep in touch with these potential buyers on a year-round basis, updating them on products and manufacturers who'll be at the next show.

IBC receives support from a number of sources, including: industry; the governments of Canada, Saskatchewan and Manitoba; and the farm progress show. The centre and progress show are promoted at more than 70 Canadian consulates and trade offices around the world.

Going Lean to Grow

Competition is good, but co-operation can be a good way to compete better. Manufacturing companies in the NorthSask Lean Consortium provide one such example.

"There are companies here that we will go to battle with in the marketplace, yet we will work together to make us all more efficient," says Kevin Dow, president of Schulte Industries, an agricultural equipment manufacturer in Englefeld, Saskatchewan. "It makes it interesting," he adds.

Schulte is speaking as a member of one of Saskatchewan's three lean consortia, groups of companies from a variety of industry sectors who've joined together to learn the principles and practices of lean. In simple terms, lean means creating more value for customers using fewer resources. Adherents strive to eliminate activities that don't create value and organize those that do into a tight sequence so the product "flows" smoothly to the customer.

And it's not just about making things. Dow says one of the biggest drivers of lean around the world is the health care industry. He saw lean principles at work while volunteering as a fundraiser for a new hospital at Humboldt. Staff expected to be working in particular areas were surveyed to determine their anticipated usage patterns to help build efficiency into floor plans.

"It's 100 per cent about process control, no matter what product you're making or service you're delivering."

The roots of lean reach back to an efficiency and waste reduction program developed many years ago by automaker Toyota. However, virtually every business and organization – even individuals – can benefit from practicing lean, Dow says.

Naturally, lean applies in different ways to different endeavours. But Dow says one of the ways manufacturing companies can quickly see its tangible benefits is to adopt and carry out a program referred to as "5 S," which stands for: Sort, Set in order, Shine, Standardize and Sustain.

He says sorting and setting in order, especially, can generate large savings in time.

"Just by methodically thinking through the tools you require and where they're best positioned, and then starting to straighten out your work centres, you're going to get your biggest gain," he says. "It's just common sense. Growing up on a farm, the best farm shops you went into had tools organized with the largest wrench to the smallest hanging up on the wall. And the broom was in the corner."

The broom represents "Shine," the third item on the list. "Standardize" refers to establishing consistent approaches to carrying out tasks and procedures, while "Sustain" alludes to the ongoing nature of the lean program. Continuous improvement is one of the mantras of lean.

Companies in the NorthSask consortium meet monthly and, in each quarter, every company is responsible for showing the group what it's been doing in the areas of lean and continuous improvement. It creates accountability, says Dow. And at least once a year, each member company hosts a meeting at their own facility.

"So you have these independent people who are dealing with the same kinds of daily issues in production and/or process improvements that will come to your plant and basically be independent adjudicators of your processes," he says. "These outside eyes provide a wealth of information that you often just can't see when you're living in it."

Dow says trust is required when competing companies co-operate. There's really no enforceable contract that can cover all potential issues, situations and circumstances. Still, businesses hosting visiting members behave prudently.

"When one of our competitors comes in, we're careful not to go into our prototyping area when we're doing anything that might be sensitive in terms of an R&D project. I mean, you have to protect yourself as well."

On the other hand, "steal with pride" is the lean mantra of choice when a visiting company representative spots a process or tool he feels would be a good fit for his workplace, says Dow.

Kevin Dow, President, Schulte Industries

Photo Credit: Keith Moulding

Saskatchewan's manufacturers represent an industry of 30,500 employees across the province and $10.9 billion in shipments in 2010. Some of the more innovative areas where products have been developed to meet identified market needs include satellite communications technology, dryland farming equipment and roadside scales for the trucking industry.

BUILDING A STRONG WORKFORCE

Janet Uchacz-Hart, Executive Director, Saskatoon Industry-Education Council

Photo Credit: Keith Moulding

Saskatchewan manufacturers need tradespeople like never before. However, with the average age of skilled workers now north of 45, and industries like mining competing hard for many of the same employees, it's crucial for manufacturers to show young people the great careers available in their industry.

That's where the Saskatoon Industry-Education Council (SIEC) comes in.

SIEC is a career information link between students and employers. The organization works with government agencies such as Enterprise Saskatchewan, as well as industry, area school boards and the Saskatoon Tribal Council to promote Saskatchewan's industries – including manufacturing – as viable career areas for students to consider.

"What we always say to employers is your future workforce is sitting in the classroom right now," says Janet Uchacz-Hart, executive director of SIEC. "We encourage manufacturers to showcase all the careers associated with manufacturing, from IT careers to welding and all the others. Most of our young people don't know what the career opportunities are in Saskatchewan and the Saskatoon area."

SIEC offers 10 programs ranging from "exploration" experiences such as Spotlight on Careers in Manufacturing – where youth are introduced to the industry, the people who work in it and the job opportunities it offers – to summer youth internships for students who show interest and inclination in a particular area. Programming is flexible and customized to meet varying circumstances.

Uchacz-Hart says summer youth internships are typically awarded to students in Grades 10, 11 and 12, but SIEC does some "targeted work" at Grades 7 and 8, as well. In 2011, almost 60 per cent of the 72 students who completed the Summer Youth Internship Program were invited to return to their respective employers next year for part-time or summer work or, in the case of Grade 12s, for full-time employment. She says this is a good result that bodes well for industry.

"We have job coaches who work with the students and employers, and there's an evaluation or growth report undertaken so the young people know which areas they need to work on. It does take employers a little bit longer, but it's an investment in their own future."

"The companies that are going to succeed are the companies that are going to mentor youth," she says. "To find out if these kids really want to be in the trades is critical."

"What we always say to employers is your future workforce is sitting in the classroom right now. We encourage manufacturers to showcase all the careers associated with manufacturing, from IT careers to welding and all the others. Most of our young people don't know what the career opportunities are in Saskatchewan and the Saskatoon area."

Programming for high school students is essential, but Uchacz-Hart says it's no longer enough. Career development today begins in elementary grades with kids learning about the types of careers available, attending job fairs and talking to guest speakers representing various industries.

A special and popular program sees teams of Grade 8 students employ lean manufacturing concepts to build cardboard boats and race them. Entries in the Cardboard Boat Race Challenge are judged by engineers as well as science and industry representatives in what's become a unique way to bring curriculum alive, she says.

"And many of our schools are also doing parent workshops and trying to engage the community to help gather information about various sectors," says Uchacz-Hart, adding guidance counsellors and teachers are spreading the word about the advantages of a college education compared to a university degree.

"For example, SIAST (Saskatchewan Institute of Applied Science and Technologies) has a 91 per cent employment rate six months after graduation."

Many high schools in the region are working to engage more youth in the trades through career work education and expanded practical- and applied-arts programming, she adds.

Another way Saskatchewan is building manufacturing careers is by encouraging partnerships between industry and educational institutions. For example, defence giant Lockheed Martin partnered with Saskatchewan Indian Institute of Technologies (SIIT) by giving the First Nations institution access to a training materials package and other learning resources valued at $3.5 million. It's part of the contractor's commitment under Canada's Industrial and Regional Benefits program that provides for regional investment – often in high-tech endeavours – from defence companies who've earned contracts with the federal government. SIIT is the only First Nations educational institution in Canada using the training package, now available to the University of Regina's engineering department as well.

University of Regina Associate Vice-President (Academic) Luigi Benedicenti says the training package contains modules on a range of subjects from aerospace engineering to software engineering, and includes some industry standards and best practices material, as well as a number of scholarships.

"The inclusion of (Lockheed Martin) material in courses will give students a wealth of industrial knowledge, raising their immediate employability as they graduate, especially when coupled with the co-operative education program and the co-operative education internship program," Benedicenti says. "Students will be exposed to industrial practices and the application of engineering science and engineering design to industry."