



A black and white photograph of a person wearing a hard hat and safety glasses, looking down at a task. The background is blurred, suggesting a workshop or industrial environment.

# CANADA'S POLYTECHNICS AND THE SKILLED TRADES



POLYTECHNICS CANADA

## Introduction

**Canada is a diverse country—in population, language, culture and geography.** As one of the most highly educated countries in the world, Canada also offers a diverse set of educational pathways. One pathway—apprenticeship—is often overlooked as a first-choice option despite the significant contributions tradespeople make to our economic and social prosperity, our global competitiveness and our advanced infrastructure.

The skilled trades are essential to Canada. Tradespeople build, maintain and repair the critical infrastructure that connects us from coast to coast to coast. They make it possible to get goods to market, keep the lights on and harness the resources that drive the Canadian economy. Skilled tradespeople have been critical to our past and will be critical to our future.

The way we train and certify skilled tradespeople is more complex than other post-secondary pathways because, in most parts of Canada, employment comes before the credential. Learners need to convince an employer to hire and train them before they can be registered as apprentices. A large majority then attend technical training several

weeks at a time, supplementing what they've learned in the workplace with instruction from experienced tradespeople in the classroom. Canada's polytechnics account for a significant proportion of that technical training: in 2020-21, more than 32,000 apprentices attended a Polytechnics Canada member institution.

Why are polytechnics the preferred destination of apprentices? Most likely it's the future-focused facilities, innovative training delivery, inclusive programming and inspirational leaders. In the coming pages, we highlight exactly how polytechnics are leading the way when it comes to training the next generation of tradespeople.



# Future-focused Facilities

**Technical training must be as innovative as the work environments in which Canada's skilled tradespeople operate.** Today more than ever before, skilled tradespeople rely on advanced technologies, cutting-edge equipment and innovative approaches to solving problems.

As first-choice training institutions for Canada's apprentices, polytechnics are well-equipped to meet the high expectations of learners and their employers. To reflect the reality of the workplace, polytechnics train apprentices on legacy systems and new technology alike, sending learners back into the field with new skills and strategies to succeed in today's fast-paced workplaces. Trades training facilities are innovative spaces that encourage learners to work in multi-disciplinary teams, provide access to specialized equipment and account for Canada's vast geography.





## Saskatchewan Polytechnic

### Mobile Training Labs

For students living in rural, remote, northern and Indigenous communities, access to technical training can be a challenge. Saskatchewan Polytechnic's mobile training labs take learning on the road, giving remote apprentices an option other than to relocate for training. Housed inside a tractor trailer unit that expands to provide 1,100 square feet of shop space, these labs are stocked with equipment, tools and training aids. Each can accommodate up to 12 students, maintaining the collaborative nature of apprenticeship training. Training lasts from seven to 20 weeks, depending on the program. The three mobile labs deliver practical, hands-on technical instruction for trades including electrician, machinist and welder, increasing accessibility to those unable to travel, providing training closer to industry and supporting learners in their home communities.



## George Brown

### Smart Welding Lab

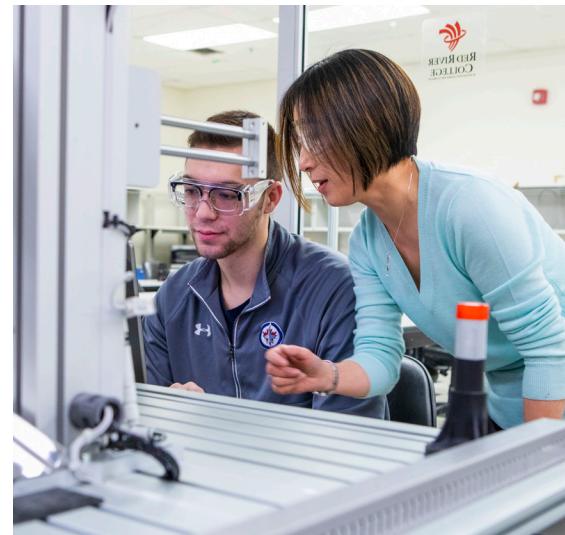
At 'the most advanced lab of its kind in the country,' George Brown is pushing the boundaries of classroom training. Their Smart Welding Lab features 26 seats that transition between processes to suit the nature of the job. Large video screens and specialized cameras capture every detail of the process, allowing students to observe and review their work in real-time. Machines are networked to upload a student's performance to cloud-based storage and assess it using data analytics. Instructors can review machine settings and time on task, as well as compare weld parameters to the final product—a level of flexibility once only available in a virtual environment. In keeping with equipment available in the workplace, there is an option to bypass 'helper' modes so students can experience legacy technology still in use across the sector. Training is designed to include the variety of metals apprentices will encounter on the job, ensuring they understand the capabilities and limitations of each.



## Red River College Polytechnic

### Skilled Trades and Technology Centre

The *Skilled Trades and Technology Centre* (STTC) is a milestone achievement for RRC Polytech and the province of Manitoba. The Centre, at more than 100,000 ft<sup>2</sup>, boosts skilled trades training at Notre Dame Campus by 30%. It houses laboratory, shop and classroom space for up to 1,000 students in high-demand trades, including carpentry, electrical, sheet metal and HVAC. The building's design incorporates Indigenous culture, offers flexible learning spaces for student-industry collaboration and includes sustainable technologies to support the transition to a green economy. The STTC is also home to closely related programs in robotics and automation, hydraulics and pneumatics, and computer-aided design.

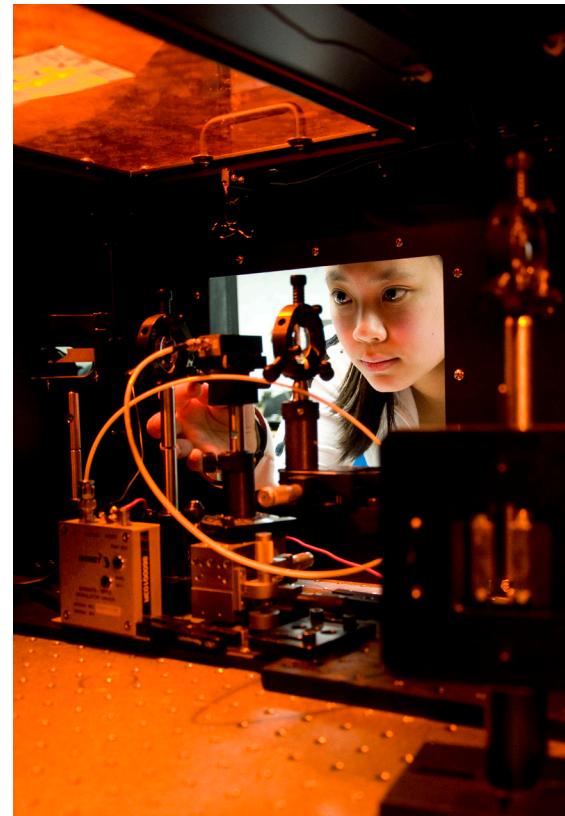


## Algonquin College

### Centre for Construction Excellence

Algonquin's *Centre for Construction Excellence* brings together the next generation of carpenters, plumbers, civil engineering technologists, interior designers and other professions under a single, green roof. LEED Platinum accredited, the centre provides 190,000 ft<sup>2</sup> for research, collaboration and training. The inter-professional space is designed to encourage collaboration between disciplines and offers a number of cross-program learning opportunities to students.

ACCE is also a living laboratory. A five-storey biowall filters the air, providing oxygen to the atrium space and all five connected floors. Built-in sensors located throughout the building provide real-time building diagnostics via LCD screens and a unique website, providing insights into the building's temperature, humidity, air quality and structural load. With its open demonstration spaces and sustainability features, the centre is a natural hub for industry partners. Bringing together students, professors and researchers with local builders and tradespeople creates synergies, increases industry awareness and produces highly skilled graduates familiar with the collaboration requirements of today's construction and design sectors.



# Innovative Training Delivery

**Though physical spaces are important to students and industry partners, top-notch training keeps them coming back.** Skilled tradespeople are the original lifelong learners, continuously adapting to new technology, regulations and codes. Polytechnics deliver future-focused and flexible training designed to ensure today's learners have the skills they need to succeed in an ever-evolving workplace. They incorporate high-quality teaching and learning methods, advanced training technologies and pathways to management and entrepreneurship-focused credentials—an effective recipe for preparing the next generation of highly qualified skilled trades talent.



## Southern Alberta Institute of Technology (SAIT)

### Blended Apprenticeship Learning

Blended learning allows apprentices to perform the theory component of their training online using videos, simulations and electronic assessments, limiting the time they must be physically present on campus. Minimizing time away from work has benefits for both learners and their employers—allowing apprentices to progress in their training without lengthy breaks in employment. Those who pursue a blended learning course of study spend about half the time on campus that a full-time apprenticeship student would. Meanwhile, learners can access all of the services associated with a traditional apprenticeship program, including access to the library, gym, tutoring and career planning, ensuring student success isn't compromised.



## Seneca

### Underwater Skills

Today's infrastructure and construction projects are conducted in all kinds of environments, including underwater. A unique program to develop the skills necessary for an underwater environment is offered at Seneca. Students in the *Underwater Skills* certificate program are trained in the commercial diving, welding, construction, inspection and salvage work necessary in sectors including the offshore oil industry. Upon program completion, graduates receive an internationally recognized certificate in unrestricted surface diving from the Diver Certification Board of Canada. With specialized skills training, graduates are positioned to work as commercial divers, underwater welders, underwater construction divers, repair divers and related careers.

## Seneca





## Humber

### Buildable Credentials for the Construction Sector

Recognizing a desire among learners to build a career in the construction sector, Humber offers three stackable programs in carpentry-construction, as well as a number of other laddering opportunities. The two-semester *Carpentry and Renovation Techniques* certificate provides practical experience to support entry into the trade. The *Building Construction Technician* diploma is a four-semester program integrating practical experience in construction processes with an understanding of building plans, codes, bylaws, standards and ethical practices. Students can move from this program into the six-semester *Construction Engineering Technology* advanced diploma, where there's an emphasis on technical data, geomatics, quality control and construction project management principles. Over time or in succession, students can prepare themselves for a wide variety of roles in the construction sector.



## BCIT

### Apprentice to CEO – Entrepreneurial Skills for the Trades

In answer to the perennial question 'Are entrepreneurs born or made?' BCIT is teaching entrepreneurial skills in their *Apprentice to CEO* program. Given the high number of small- and medium-sized businesses in Canada—many in the skilled trades—demand for programs that teach entrepreneurial skills is only logical. Whether someone is an apprentice looking to one day start their own business or a tradesperson looking for growth opportunities, entrepreneurial skills can help build and maintain a successful trades business. This program combines traditional entrepreneurial courses with a strong emphasis on establishing a trades-focused operating environment, dealing with invoicing, job tracking, estimating, financing, taxes and safety programs directly applicable to these businesses.



# NAIT

## Trades to Degrees

Many companies look to fill management, supervisory and project management positions with people who have a combination of on-the-ground skills alongside business and management knowledge. The *Trades to Degrees* program at NAIT is one of the first educational pathways in North America to provide advanced standing to certified trade professionals looking to enter a business degree program. Program design allows qualified trades professionals to enter the third year of NAIT's *Bachelor of Business Administration* program, building on their previous education and professional experience to open doors to entrepreneurship, leadership and other management opportunities. Learning options are flexible and designed to fit individual learner needs, with classes offered in a variety of ways: online, daytime, and on evenings and weekends.



# Fanshawe

## Automotive Service Technician program

Cars have gone from being simply a means of transportation (and self-expression) into the realm of high-tech, with new gadgets and capabilities added every year. Meanwhile, gas-powered vehicles are giving way to hybrid and electric vehicles which are in turn yielding ground to self-driving vehicles. It's hard to know where the technology will go next. Fanshawe is one of several institutions across the country training a new generation to work with cars that require as much expertise with a computer as a wrench. Apprentices learn how to interpret data from vehicles, but also how to teach themselves as new technological innovations come their way. In the engine lab, students have access to a variety of vehicles, including electric and hybrid models, to ensure teaching and research reflects industry standards and consumer preferences.



# Supporting Diversity and Inclusion

A successful labour market is one that encourages, harnesses and celebrates Canada's wealth of diverse perspectives and talent. Diversity and inclusion in our workforce strengthens workers, businesses and communities, bringing unique perspectives to projects and leveraging a broad range of experience to achieve new solutions.

With impending demand for skilled labour across the country, polytechnics recognize the challenges inherent in the under-representation of women, immigrants and visible minorities in the skilled trades. Indigenous apprentices also face barriers to program progression and certification. Targeted programs and services at Canada's polytechnics contribute to industry efforts to diversify the trades workforce.



## Conestoga

### Women in Skilled Trades (WIST) General Carpenter Pre-Apprenticeship

This 34-week program for low-income, unemployed or under-employed women is designed to equip students with skills and strategies to secure an apprenticeship position and work safely as a general carpenter. The program is offered tuition-free and is funded through the Ontario Ministry of Children, Community and Social Services and the Office of Women's Issues. Students receive 26 weeks of practical theory and hands-on experience, followed by an eight-week paid work placement. The curriculum provides learners with foundational apprenticeship training along with skills designed to increase general knowledge of the construction and renovation industry. One unique feature of this program is the development of complementary skills, such as job search strategies, communication, computer literacy and relevant digital applications.



## Saskatchewan Polytechnic

### Women in Trades and Technology (WITT) Mentorship Program

Mentorship is a critical part of apprenticeship training, with proven impacts on completion and certification rates. When it comes to efforts to include a diversity of Canadians, mentorship is particularly valuable. As a female student or apprentice at Saskatchewan Polytechnic, learners have access to supports and mentorship opportunities both during their studies and after graduation. The institution's *Women in Trades and Technology Mentorship Program* connects women with experienced trades and technology professionals to support their journey from education to employment.





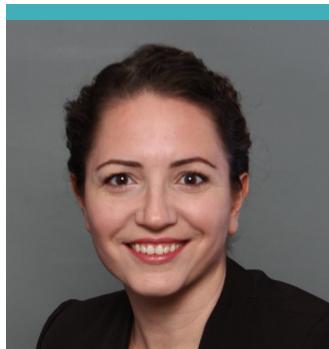
## Red River College Polytechnic Introduction to the Trades

Indigenous student success is integral to Canada's prosperity generally and our skilled trades workforce in particular. The *Introduction to the Trades* program is intended for Indigenous learners looking for a point of entry to a wide range of trade careers, preparing students to enroll in one of RRC Polytech's trade programs. Learners visit shop spaces, job shadow and meet with potential employers as part of the program. The program incorporates Indigenous perspectives, making a connection between program elements and Indigenous cultural values, traditions and beliefs. An Indigenous cultural and spiritual advisor offers weekly circles, cultural teachings and other traditional ceremonies in a way that reinforces a positive cultural identity and enhances self-esteem and pride. Tutorials and supplemental instruction are built into the program to address individual needs.

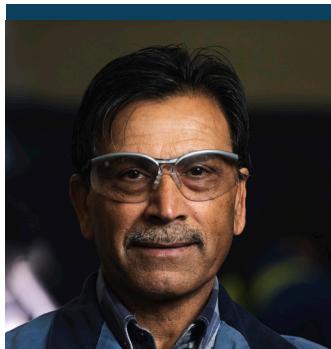


# Inspiring Leaders

**Apprenticeship training is predicated on knowledge transfer from one generation to another, with master tradespeople passing along skills, know-how and insights to those training under them.** Currently, the skilled trades make up 22 per cent of the Canadian labour force—approximately 1 in 5 jobs—and demand is expected to remain strong. In fact, according to the Canadian Apprenticeship Forum, Canada will need to attract more than 256,000 new apprentices in the next five years just to keep pace. That level of demand requires today's accomplished tradespeople to educate and empower the next cohort of skilled workers, encouraging them to add new ideas and fresh perspectives to established practices. Polytechnics are an important point of intersection between leaders of today and the next generation of highly skilled workers.



**Anna Strachan**  
SHERIDAN COLLEGE



**Al Azadwinder Singh Sumal**  
KWANTLEN POLYTECHNIC



**Don Gosen**  
CONESTOGA



**Cecile Bukmeier**  
NAIT

## Anna Strachan

Sheridan

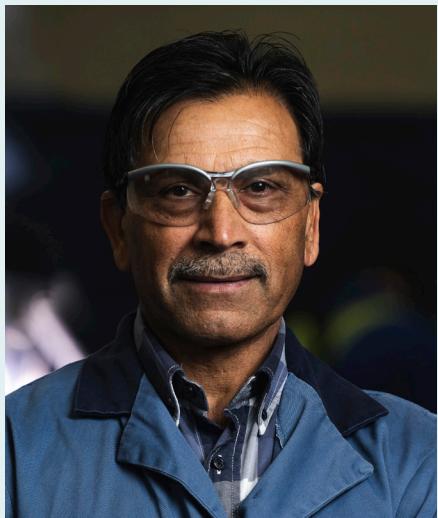


From an early age, Anna Strachan had a keen interest and curiosity in mechanical assemblies and how they work. A manual drafting course in high school and a pre-trades course at Sheridan started her journey toward concurrently completing Canadian and German apprenticeships in both tool and die and mold making, followed by a degree in Mechanical Engineering. Working alongside doctors designing medical devices, Strachan developed a minimally invasive heart surgery tool for which she now holds a patent.

Today, Strachan is the Associate Dean of the Magna School for the Skilled Trades at Sheridan. She is committed to raising the profile of an industry that, in her eyes, is socially undervalued in North America. Strachan is also working to build a culture of inclusion that allows women to see the skilled trades as a viable, first-choice option for their talent. Being in the skilled trades “does not mean you’ve given up on a dream. It is the dream.”

## Al Azadwinder Singh Sumal

KPU



Al Azadwinder Singh Sumal has been welding for more than 45 years and training cohorts of welders at Kwantlen Polytechnic University for the last three decades. In recognition of his outstanding teaching accomplishments, he was the 2018 recipient of the Howard E. Adkins Memorial Instructor Membership Award by the American Welding Association, becoming the first person from British Columbia to receive the award.

Beyond the classroom, Sumal is helping under-represented groups explore welding careers by promoting welding at skilled trades forums and high school events, and by developing programs for women and Indigenous peoples. He is also working with a non-profit organization in India to establish a welding and metal fabrication program for under-privileged youth.

## Don Gosen

Conestoga



Don Gosen is a two-time graduate of Conestoga College—completing an electrical apprenticeship and a *Water Resources Technology* program. In the years since, he has been both an employer partner and an instructor, cementing his reputation as a leader and apprenticeship champion in the broader community. Gosen sponsored more than 70 apprentices in four decades as president of Gosen Electric before selling the company to three of his former trainees. Gosen received the 2018 Premier's Award—designed to recognize the social and economic contributions of Ontario college graduates—in the apprenticeship category.

## Cecile Bukmeier

NAIT



When Cecile Bukmeier began working in an auto body shop as a teenager, there were very few women in the shop and none working in the back of the garage. Today, with years of industry experience under her belt, she is the first female instructor in NAIT's *Auto Body Technician* program. Bukmeier is one of Alberta's top technicians, earning gold medals from Skills Canada Alberta in 2013 and later at the national level. She is not only an industry leader, but a strong champion and advocate for women in the trades. Her "I'll show you" attitude is the inspiration behind her efforts to guide apprentices through the challenges she faced or, ideally, eliminate them altogether.

## About Us

**Polytechnics Canada** is the voice of leading research-intensive, publicly supported polytechnics, colleges and institutes of technology. Our mission is policy advocacy for federal action in innovation and skills.

Polytechnics Canada members play a critical role in enhancing Canada's productivity and innovation. Through their facilities and networks, our members provide meaningful solutions to industry problems and accelerate knowledge transfer. Graduates are job-ready and armed with the skills employers need across sectors.

Close ties to industry make the polytechnic talent pipeline dynamic and responsive to the challenges of developing the future workforce. Polytechnics work with industry to build programs and design curricula, to conduct applied research that helps firms scale and get products to market. They offer students work-integrated learning opportunities and position graduates for careers. Beyond the traditional student, polytechnics embrace those at mid-career who find themselves displaced from the labour market or simply need short-term retooling to refine and modernize their skillsets.

At Polytechnics Canada, we are proud promoters of the polytechnic education model—applied, hands-on and technical; industry-focused and industry-driven.

Learn more at [polytechnicscanada.ca](http://polytechnicscanada.ca).

## Our Members

