

Applied Research, Innovation  
& Entrepreneurship

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**2018-19**



## Welcome

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The Office of Applied Research, Innovation & Entrepreneurship brings Algonquin College's talented professors and students to greater Ottawa's business, industry, and community organizations to collaborate on applied research projects that provide practical solutions to everyday issues and create new and innovative products and services.

We focus on helping Algonquin College:

- Support social, cultural and economic growth in the community
- Enrich student learning
- Prepare students for the workplace
- Enhance faculty and staff development
- Improve student retention

Beyond theory and principle, applied research allows academic experience to become a journey of personal discovery. Our students get to use a hands-on approach to the latest information and technology, creating new products, services and processes that not only resolve modern challenges but also enrich our communities. We guide students down a learner-driven path of discovery, starting with dream development. We teach the flexibility of applied learning and then let students experience it until it leads them to a workplace transition.

**APPLIED RESEARCH GOES BEYOND THE THEORETICAL.  
IT IS REALLY ABOUT LIFE.**



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# Transforming Hope & Dreams into Lifelong Success

In a crowded higher education market where universities are scaling up their practical training, it's more important than ever for Algonquin College to more deeply align itself with its industry partners and the communities it serves. Education that includes applied research and entrepreneurship is vital to helping Algonquin strengthen these connections and maintain a competitive edge.

The main advantage of Algonquin's focus on applied research and entrepreneurship is that it offers students both work-integrated and experiential learning opportunities. Students put their learning into action in actual workplaces, which bolsters their skills and helps them make career-building connections. At the same time, more local businesses come to view Algonquin as a valuable resource for advancing their enterprises.

# Embedding a mindset of Innovation & Entrepreneurship in all our learners, founded on Indigenous Teachings

Algonquin College is located on traditional, unceded territory of the Algonquin people, and the college has committed itself to making Indigenous cultural values an integral part of its institutional fabric. The Institute for Indigenization, located on DARE's second floor, will focus on how to include and embed Indigenous knowledge and values throughout the College organization, including areas such as entrepreneurship.

We can draw many lessons from the vast body of Indigenous knowledge on how to foster an entrepreneurial spirit and foster a mindset of innovation. The historical resiliency of Indigenous peoples is reflected by their proven ability to deal with challenges and adapt to change. Their culturally distinctive concepts focuses on community benefits over the individual's success. This way of thinking offers rich insights on how to create a more sustainable and equitable planet.

Algonquin College prioritizes ingraining Indigenous knowledge in its entrepreneurship education, projects and activities. This ensures that we take both a culturally and community-sensitive approach when conceptualizing, validating and implementing entrepreneurial ventures.



# DARE District Building

Algonquin College's new DARE (Discovery Applied Research Entrepreneurship) District is a hub for generating innovative ideas, nurturing startup enterprises and driving cutting-edge education.

DARE District is a multidisciplinary environment in which students and faculty members can engage in a broad range of applied research and entrepreneurship activities. Learners will have opportunities to pursue projects with industry partners, collaborate with their peers, build product prototypes, launch entrepreneurial ventures and more. It will be home to new training and test facilities for high-demand job sectors, a multimedia production facility and expanded ARIE initiatives and centres.

- The first-floor Showcase Zone is designed to provide central spaces for gathering and teamwork. It includes a Student Collaboration Space, Employee Innovation Hub, the Indigenous Commons, the User Experience Lab, the Energy Research Lab and the Social Innovation Lab.
- Second-floor Discovery Zone highlights include a Digital Literacy Lab, a Presentation Studio, the Cybersecurity Centre and the DARE Innovation Centre, featuring a business incubator, a Maker Zone and Studio, and more.
- The third-floor Learning/Library Centre Zone is wired for the latest in high-tech learning — a 21st-century library with everything from digital-literacy labs and student learning centres to studios for multimedia presentations.

Indigenous knowledge, methodology and imagery are embedded throughout the DARE District's design, identity and purpose. They include the Indigenous Commons gathering place, the Institute of Indigenization, the Indigenous outdoor courtyard to be completed in fall 2018, and an area in third floor library that will serves as a repository for traditional Indigenous knowledge.

DARE District will be pivotal to enhancing the innovative and entrepreneurial spirit. By supporting experiential education for students, development opportunities for faculty and staff, and creating productive industry partnerships, DARE District can help to promote regional economic and social growth.

# Applied Engineering Centre

## MISSION AND VISION

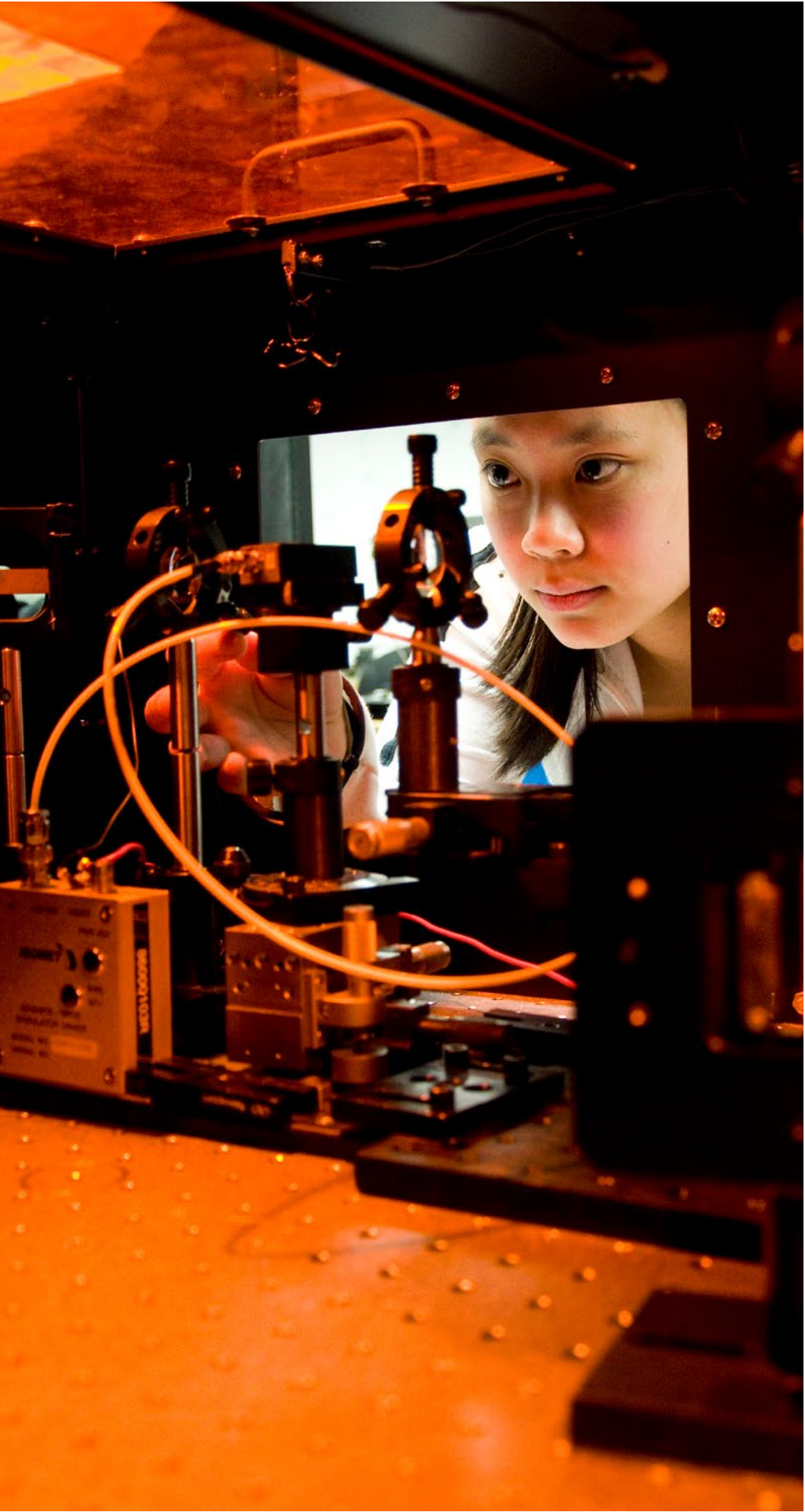
The Applied Engineering Centre (AEC) has the mission to mobilize College talent in engineering-related disciplines in order to foster regional innovation.

## GOALS

Our goals include assisting company partners in proof-of-principle prototyping and testing of their innovations, as well as mobilizing College faculty and students in applied research projects aimed at solving company challenges. We aim to foster collaboration between the College and local innovators, and also to prepare research grant proposals that enable applied research projects and enhance the College's profile in the community.

## CAPABILITIES

The AEC has expertise in WiMAX and wireless communications, mechanical and electrical engineering technology, optics and robotics. We also do stand-alone projects, which are subject to research grant approval, and can be undertaken in engineering-related disciplines as well as trades. In addition, the AEC also facilitates in-class projects in computer and engineering disciplines via fundraising and liaison with company partners.



“ You are really thrown into a much more challenging situation. The risks are higher and the rewards are a lot higher too.”

**Gregory Wong**

STUDENT, WORKING AS RESEARCH ASSISTANT WITH A STARTUP TECHNOLOGY COMPANY

## INDUSTRY PARTNER TESTIMONIAL

“ I’m definitely happy with our students. I taught for seven years in programs that are now doing research for us, so I’m well aware of the capabilities of students. Technology is changing rapidly and the ability of students to keep up - and continue to keep up - always amazes me.”

**Adam Jarvis**

GLOBAL ADVANTAGE, VP POLICY AND RESEARCH

# Construction Research Centre

## MISSION AND VISION

The Construction Research Centre is a gateway to the future, a place where we can train highly qualified personnel with leading-edge tools. Our research projects achieve economic stimulus by helping companies innovate, benefitting all parties involved as well as the community at large.

We continue to generate economic stimulus by helping enterprises in need while also supporting learners as they evolve into skilled professionals. Our program also leverages the construction industry, improving evidence-based decision-making in building design, developing collaboration tools to better connect people in the industry, and improving process efficiency.

## GOALS

We strive to connect our students to an extensive and diverse industry through mobile technology. We use and quantitatively compare different construction techniques and materials, providing students with new knowledge that can be shared with industry partners.

The final results of a build are measured to determine if it behaves as intended, a learning process that provides a foundation for professional success.

## CAPABILITIES

We are proud of the Construction Research Centre's array of twenty-first century tools. Our capabilities include 3D printing, laser engraving, Virtual Reality and hologram technology. Our digital building sensors are able to measure structural performance, providing valuable information used to improve plans and designs.

Our approach boosts efficiency for a range of entities, from large enterprises to the individual contractor. Everyone involved in a project can communicate design information and change orders well beyond the pace of traditional methods. ARI students develop unique expertise with ultra-modern equipment that many businesses do not have access to.



“When I came to Canada, I chose Algonquin College because they had a research department. I became the first ARI volunteer. I had done a thesis in 3D printing so the Lebreton Flats proposal was a perfect collaboration. There were still a lot of unknowns in the centre and they were still figuring out the new printers, so I brought that knowledge in.”

**Mauricio Ledón**

STUDENT, THESIS IN 3D PRINTING



## INDUSTRY PARTNER TESTIMONIAL

“I was introduced to Alex Yang and we saw eye-to-eye on the idea of striving for innovation. We put together a pilot project called Masterpiece VR. It went extremely well and students did a great job. We were able to build proof of concept of something that is taking on the industry right now.”

**John Gagne**

BRINX, MASTERPIECE VR

# Data Analytics Centre

## MISSION AND VISION

Data Analytics Centre (DAC), helps companies adopt and develop solutions for Big Data-related technologies and business practices. Algonquin's data initiative is the first of its kind in the Canadian college system. We work with local and national partners to apply data-integration and machine learning for predictive analysis in the form of distributed cloud intelligence. We will continue growing and developing into the future, expanding on the thirteen research projects that commenced in the summer of 2017 when the Centre opened.

## GOALS

The DAC aims to increase the value of a student's experience, arming them with the ability to solve unique problems, thereby increasing their employability. We strive to provide the most relevant, up-to-date education and training in Data Analytics and Big Data technologies.

## CAPABILITIES

Our areas of expertise involve applying both tried-and-tested and promising, new data-related technologies to real-world problems and business practices. While building this capacity, we essentially pioneered machine-learning and cloud computing at Algonquin. Students, faculty and business partners now routinely use cloud-based infrastructure and Application Programming Interfaces to develop new software prototypes, services and processes based on data analytics and machine learning. As an added benefit, our teams also develop a solid understanding of the fiscal and security aspects of cloud computing.

One of DAC's strategic goals is to develop capacity in cognitive modeling and deep-learning techniques, therefore we actively look for business partners with interests and needs in these areas. We are also involved in curating, integrating and processing Internet of Things data streams and deriving appropriate insights and actions.

DAC's teams exemplify and embody the spirit of relentless re-education and experiential learning at ARI. The young researchers acquire in-demand new skills from faculty supervisors, such as Professor Eric Torunski and Steve Conrad, and from active, online personalized training. Many demonstrate considerable progress within one/two semesters, thus greatly expanding their professional horizons.



“It’s definitely a lot more hands-on than university which makes it much better I think, because it’s more practical. After you finish school you can jump right into an IT or computer related field. I’m more of a hands-on learner and I don’t like sitting at lectures for too long.”

**Allen Hsu**

STUDENT, PEER REVIEW PLATFORM  
CLIENT: FELLOW INSIGHTS



## INDUSTRY PARTNER TESTIMONIAL

“Applied Research allowed us to truly accelerate the development process. The balance of resources allowed us to build something we wouldn’t have been able to do without third party funding. At the end of our project, we had a pretty robust beta version of our proof of concept.”

**Carl Byers**

CSO CONTEXTERE

# Design Centre

## MISSION AND VISION

We support applied research projects focused on User Experience (UX) design through collaboration with industry partners in Ottawa’s high tech sector. By learning from user research we provide a unique approach to technical problem-solving.

## GOALS

Our primary goal is to develop new applied research capacity at Algonquin College for the benefit of students, faculty, staff and external partners. We also aim to support our partners through leading edge UX design in the implementation, improvement and commercialization of their products, services and processes.

## CAPABILITIES

We are resourceful and innovative. Our strength is in our ability to come up with unique solutions to technical problems that would otherwise go unresolved. By focusing on user experience research, we consider the people who use technology as much as the technology itself. Students learn about customer journeys, task flows, scenarios and user personas, and then design user interfaces that are optimized for mainstream users and their user experience journey.



“ My role in the project was asset creation. I learned the value of Time management first hand and the importance of it in real-world applications.”

Cyril Gwaze

GBATTERIES VIDEO,  
INDUSTRY PARTNER: GBATTERIES



## INDUSTRY PARTNER TESTIMONIAL

“ The whole interaction with ARIE has been extremely positive. The students created very professional and capable website at a low cost”

Dave Watters

PRINCIPAL OWNER, GLOBAL ADVANTAGE

# Health & Wellness Research Centre

## MISSION AND VISION

We focus on the convergence between technology and health, developing modern solutions for real needs. The Centre leverages Algonquin College’s design and engineering talent to assist both industry and community partners. Our students and faculty collaborate with hospitals, research institutes and other organizations to develop digital technologies that make a positive impact.

## GOALS

We seek to assist our partners in harnessing technology that can positively affect health, both individually and collectively. Our program aims to enhance the transition of students into the workplace as they evolve from learners to skilled professionals.

## CAPABILITIES

There is no end to the potential for health and wellness research. We can take a proverbial “back of the napkin” concept and develop a functioning, digital technology prototype. In fact, that is what we do best.



“ It was a very rewarding experience, and one that I will never forget.”

Erica Randall

#FLASHFORWARD

## INDUSTRY PARTNER TESTIMONIAL

“ Your students were amazing and they deserve all the credit they receive. As do you for managing the project. Let’s keep working together!”

Dr. K. Wilson

THE OTTAWA HOSPITAL

# Pembroke Campus

## MISSION AND VISION

Our purpose is to infuse local sectors with creativity and innovation. We achieve this by enhancing applied and experiential learning opportunities, synergizing resources between college and community, and making the Pembroke Campus a leader in rural innovation. We envision the Pembroke Campus Applied Research Centre as a hub for rural innovation in the fields of healthcare, resource and environment, adventure tourism, and rural entrepreneurship.

## GOALS

We seek to produce applied and experiential learning opportunities for students and faculty that directly benefit the local community. It is essential that we participate in sustainable research that is environmentally, fiscally, and socially responsible. Another goal is to develop and maintain strong, lasting partnerships with community sectors in order to build capacity and drive change. We aim to tap into new markets and share knowledge with the outcome of creating a thriving, connected community that supports dynamic ways of thinking and behaving.

## CAPABILITIES

With approximately 1000 students, our small campus makes a big impact. We are leaders in personalized and experiential learning as a result of our intimate student population, close-knit community ties and innovative programming. Our highly skilled faculty specialize with in the health sciences, tourism, education and more.

Our programming effectively represents our community sector demographics: health and social sciences, environmental resource sectors (e.g., agriculture and forestry), outdoor adventure tourism, small-to-medium enterprises, and skilled trades. We have created a balanced, multi-sectored partnership portfolio, extending the resource and knowledge base beyond community borders and reaching out to new opportunities that foster growth, innovation, and change.

For more than three years we have been working within the agricultural sector through water quality and quantity monitoring, agricultural best management practice implementation and biomass research using multispectral imagery. Also, in lab prototype testing for algae harvest and biofuel extraction. The Pembroke Campus houses advanced lab facilities for controlled experiments and high-end equipment, both in the environmental and health sciences. These resources are in-kind contributions on community research projects; resource sharing is a crucial component to successful applied research projects. We ensure that knowledge and resources are available in our communities of practice.



“ I was able to build skills in many different areas, expanding my knowledge set. The experience will prove very beneficial in securing employment in the Environmental Technician field moving forward.”

**Paul Cipriani**

ENVIRONMENTAL TECHNICIAN  
CO-OP STUDENT

## INDUSTRY PARTNER TESTIMONIAL

“ I have worked with Algonquin College’s Pembroke Campus for several years on projects related to agricultural production and water quality. The high quality of their work, how they work with the local community, and their ability to integrate their students into projects is quite impressive. They have always met contract and reporting deadlines and have been a great partner on our projects.”

**Peter Doris**

ENVIRONMENTAL SPECIALIST, ONTARIO MINISTRY  
OF AGRICULTURE, FOOD AND RURAL AFFAIRS

# Perth Campus

## MISSION AND VISION

We strive to build on the strengths of Perth’s small town setting, offering a high-quality education in a friendly, rural community. Applied Research in Perth focuses on the intersection of skills between heritage trades and advanced building technology with the intent of preserving our built history while also managing environmental impact.

## GOALS

It is our aim to provide students with the opportunity to learn and grow with the local, rural environment in mind, to support it and provide solutions for sustainability. Learners will be prepared for the situations and opportunities that present themselves in today’s challenging markets.

## CAPABILITIES

The Building Innovation Research Lab (BIRL) is the most significant project our campus is involved with. Literally, it is an opportunity for innovation from the ground up, providing an ideal setting for students to gain hands-on, experiential learning in the construction sector. Our principles are sustainability and energy efficiency; our decisions are evidence-based. From footings to finishes, learners work under the guidance of expert professors and with local community partners.

Course offerings include: Construction Carpentry – Advanced Housing, Carpentry and Millwork – Heritage, Masonry – Heritage and Traditional, Social Service Worker, Personal Support Worker, and Office Administration – Executive.



“ Having the opportunity to work with Applied Research on the Ecotay Project has allowed me to apply my skills of design and carpentry on a daily basis throughout this project. I have been able to learn and grow my skills, work with clients, project managers, and sub-trades to see a project come to life. This experience would have taken much longer if I was merely working in the trades. The project itself has been a fantastic collaboration to maintain a traditional style of architecture while applying advanced building techniques, energy efficiency, and new innovative systems. This retrofit has been a terrific learning experience that involved knowledge being passed down from Heritage Carpenters (Algonquin College Alumni), learning traditional building techniques, solving a building envelope to ensure the best overall building performance is achieved, all while maintaining the traditional character and charm of the 180+ year old building”

**Kyle Durante**

ADVANCED HOUSING STUDENT, B. ARCH SCI.

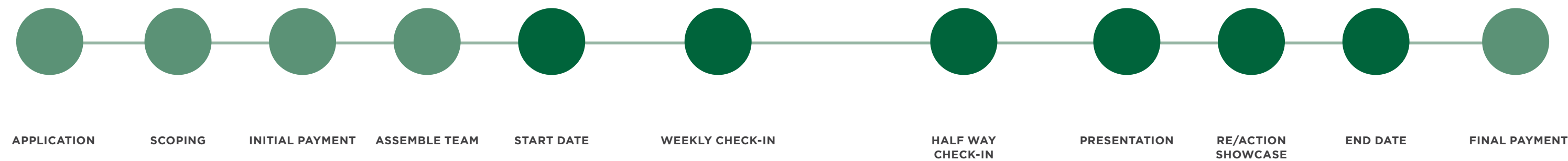
## INDUSTRY PARTNER TESTIMONIAL

“ Occasionally a demonstration project gets constructed that changes technology on a global scale and quite possibly, Ecotay’s Upper Canada House project will fall into that category. There are millions of older masonry buildings around the world and in order to meet the UN’s climate change deadlines, all these buildings will have to be retrofitted to zero emission performance. Other government programs do not typically fund applied research but Algonquin College has been wonderfully supportive.”

**Michael Glover**

OWNER, ECOTAY

# Applied Research Project Timeline



# Innovation & Entrepreneurship Centre

## MISSION AND VISION

The Innovation & Entrepreneurship Centre (IEC) cultivates an ecosystem of people, programs, partnerships and resources that offers students, employees and alumni experiential learning with a focus on igniting their innovation skills, entrepreneurial mindset and entrepreneurial endeavours.

## GOAL

Create a community of empowered entrepreneurs, intrapreneurs and innovators.

A snapshot of some of the programs and services available through the Innovation and Entrepreneurship Centre.

## DARE INCUBATOR

The Discovery, Applied Research and Entrepreneurship (DARE) Incubator provides entrepreneurs with the resources, guidance and operating space to develop their bright ideas into viable businesses or side hustles. The incubator offers co-working space, business development workshops, events, mentorship from established local entrepreneurs, and connections to the Algonquin College and Ottawa ecosystems.

## MAKERSPACE

Our new MakerSpace in the DARE District provide opportunities for learners to work on practical projects and share ideas and knowledge with their peers. Offering a wide range of maker equipment, our two maker spaces offer innovators a place to conceptualize, experiment and build. Open to the entire Algonquin community and external partners, these facilities are designed to foster creativity, collaboration and innovation.

The MakerSpace is an open-format space for group collaboration on hands-on projects, developing and testing prototypes, trying out new technologies and processes, and even selling what you make. The studio will run workshops on ideation, innovation and entrepreneurship.

The MakerSpace features a broad selection of tools and technologies for makers of all types, including 3D printers, virtual reality stations and a laser

engraver. A lab technician conducts technology demonstrations and helps users put their ideas into physical or even virtual form. The zone is an ideal venue for field trips for some academic programs.

## SUMMIT

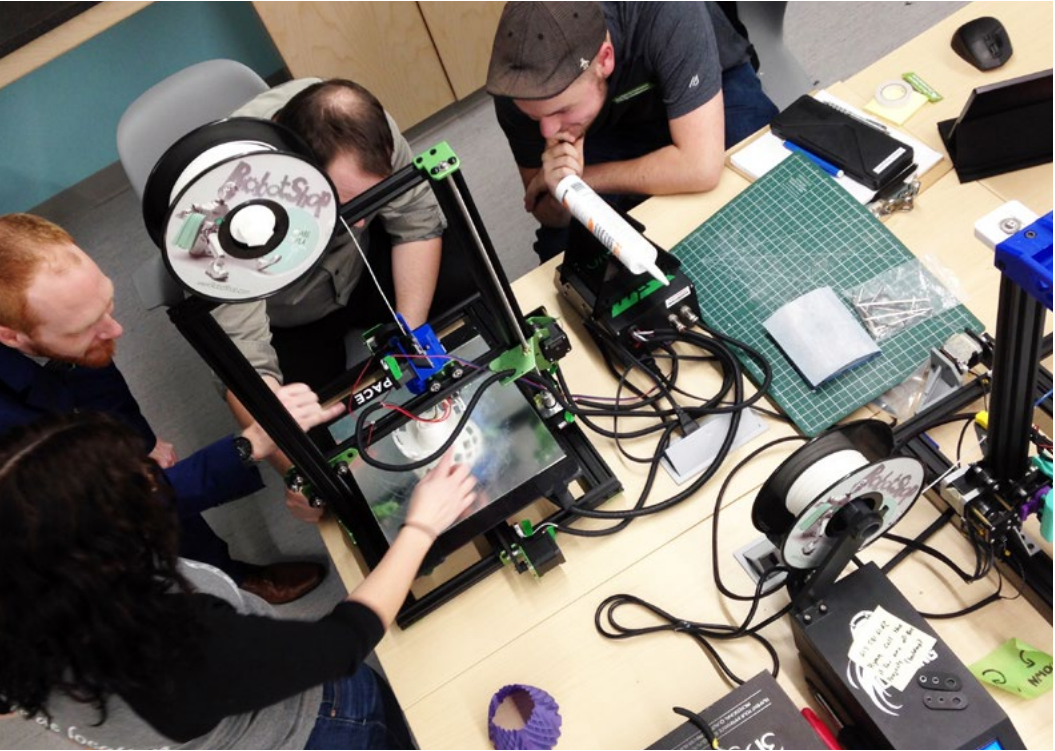
SUMMIT is a hands-on training and support program to help young entrepreneurs develop their business idea. This summer intensive runs each year in May and June and offers workshops, guidance and funding to help participants conceptualize, build and establish their ventures.

Participants take part in more than 40 workshops to help develop not only their business skills, but the foundational skills and innovation skills that are so necessary for entrepreneurs – such as communication, collaboration, experimentation and resiliency.

We provide our SUMMIT grads with the ability to envision, imagine and create. We introduce them to the world of entrepreneurship and give them insight into their capabilities and the confidence to move forward – it is much more than just a ‘move your business forward’ intensive.

## MENTORSHIP

Mentorship@AC is a program designed to provide entrepreneurs with mentorship from successful entrepreneurs and experts in their field who offer the guidance, knowledge and support they need to move their business idea or existing business forward.



## CAPABILITIES

The Centre allows users to acquire the invaluable innovation and entrepreneurial skills that help refine their business idea, develop their action plan and build their foundational skills. With an emphasis on product, business and talent development, the office is equipped to support a diverse range of pathways to innovation and entrepreneurship.

Open to current students, employees and alumni, this complement the existing resources include – events, education, programming and mentorship. The Centre complements the existing support offerings within Algonquin College, including those provided by Applied Research.

And we are proud of the Centre's recognition – winning both the Startup Canada Ontario Entrepreneurial Support Award (2017) as well as the National Association for Community College Entrepreneurship (NACCE) Excellence Award (2018) – the only Canadian College to be nominated and a winner.

## INDUSTRY PARTNER TESTIMONIAL

“The Innovation and Entrepreneurship Centre has been my go-to for anything to do with entrepreneurship or running my business. The Centre has provided me with a space to work out of, resources and endless support from the entrepreneurship team. More than just a physical place, the IEC is a network of mentors, entrepreneurs and business professionals, all working together to help innovation and entrepreneurship grow within the College and the community. I couldn't have gotten as far as I have without it.”

**Patrick Mahaffy**

OWNER, GO-FREE

# Acknowledgments

Our efforts in this would not be possible without the continued support of our partner companies, our great college and our amazing funders including the Natural Sciences and Engineering Research Council of Canada (NSERC), Social Sciences and Humanities Research Council of Canada (SSHRC), Ontario Centers of Excellence (OCE), and others who support our mission.



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