



STRATEGIC RESEARCH PLAN





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Durham College is committed to a diverse and inclusive campus for all students and employees, regardless of race. We condemn all forms of anti-Black racism and all systems of oppression which deny individuals the right to equitable treatment, access and fairness. We acknowledge that systemic and institutionalized racism serve to limit the opportunities and potential of members of the Black community and Durham College pledges to listen, learn and take actionable steps to ensure equitable and inclusive access for all.

OUR COMMITMENT TO INDIGENIZATION

Durham College recognizes that Indigenization is a continuous process requiring each member of our campus community to actively commit to reconciliation with the goal of building respectful, reciprocal relationships that will contribute to better educational outcomes for all students. Inherent among this commitment is our pledge to uphold the seven principles of the Indigenous Education Protocol for Colleges and Institutes of which Durham College is a proud signatory.



Many of the photos in this publication were taken prior to the COVID-19 pandemic.

MESSAGE FROM THE DEAN

I am pleased to launch the Office of Research Services, Innovation and Entrepreneurship's (ORSIE) 2020-2023 Strategic Research Plan for Durham College (DC). Developed in consultation with faculty, researchers, students, external partners, and research staff, the following plan is driven by the intention to intensify and strengthen DC's applied research agenda. It also aligns with the college's Strategic and Academic Plans, and outlines four goals that build on prior Strategic Research Plans by leveraging the college's exceptional talents and the demand that exists in industry and the community.

Applied research continues to make positive contributions to the learning environment for both students and faculty, and provides valuable experiential learning opportunities. At the same time, industry and community partners are able to access DC's faculty expertise, state-of-the-art facilities, and student talent, with results that provide valuable insights, address challenges, advance commercialization goals, and make significant impacts.

I am immensely proud of our accomplishments to date. DC has been named one of Canada's Top 50 Research Colleges seven times, won Bronze in the 2020 Colleges and Institutes Canada (CICan) Awards of Excellence in the Applied Research and Innovation Excellence category, and won the 2020 Greater Oshawa Chamber of Commerce Business Excellence Award in the Innovation category in recognition of the impact of the AI Hub. Over the last decade, ORSIE has also successfully managed over 380 projects in compliance with multiple funders' requirements.

We now find ourselves living in a world that has been irrevocably changed. As we look ahead, the next five years will be vastly different and we will be challenged to respond with creativity and resourcefulness in our pursuit of excellence; I have every confidence that we will succeed.

TOGETHER, WE ARE LEADING THE WAY.



Debbie McKee Demczyk
Dean, ORSIE

LEADING THE WAY



INTRODUCTION

Durham College (DC) strives to build an appreciation for life-long learning by delivering high-quality programs that are responsive to community needs. A dynamic and supportive learning environment is enhanced when applied research activities are incorporated, enriching the student learning experience, deepening the breadth of faculty knowledge, and strengthening links with external stakeholders.

Signed in the summer of 2020, the college's [2020-2025 Strategic Mandate Agreement](#), enabled DC to renew its commitment to the Ministry of Colleges and Universities to provide exceptional hands-on learning experiences for students while continuing to foster benefits for the broader community.

The College's [2020 – 2025 Strategic Plan](#) recognizes the positive contributions that applied research offers to the learning environment for both students and faculty, and the beneficial experiential learning opportunities applied research can provide. In realizing the connections applied research can forge with industry and community partners, as well as the creativity, innovation and impact that can result, DC continues to prioritize the need for faculty and students at the forefront of its evolving applied research practices.

In addition, DC's [Academic Plan 2020 – 2025](#) outlines five goals designed to create an exceptional learning experience for students and ensure their success. Specifically, goal four aims to intensify and strengthen the college's applied research agenda. The Strategic Research Plan addresses this shared goal by identifying how research activities will be bolstered and supported.

Established in 2009, ORSIE recently passed its tenth-year milestone for applied research. Since its formation, it has championed applied research activities across the breadth of program areas and expertise at DC. To date, the college has received \$15.4 million to support research activities, has been ranked as one of Canada's Top 50 research colleges seven times, and received accolades from Colleges and Institutes Canada as a recipient of the Applied Research and Innovation Excellence Award 2020.

As ORSIE embarks on the implementation of its third Strategic Research Plan, renewing our course for the next five years, we reflect on our journey thus far. DC's first Strategic Research Plan was implemented in 2011 to integrate a culture of discovery and innovation into the academic environment and set a framework for research infrastructure. Significant foundational elements were established including a research policy framework, a research ethics approval process, financial and project management mechanisms for research projects, and research-related professional development activities. An ORSIE Annual Report was initiated to highlight successes and outcomes from the college's research activities. The second Strategic Research Plan further strengthened this foundation and worked to celebrate, support, and refine DC's areas of research strength.

The overarching goal of this Strategic Research Plan is continuing to expand the research capacity of our faculty and students to engage in applied research; leveraging the college's current expertise in concentrated areas of applied research; focusing on strengthening emerging research areas and addressing unmet needs identified by our community.



CONSULTATION PROCESS: ENGAGING OUR COMMUNITY

With the goal of collecting feedback from a variety of applied research stakeholders, ORSIE embarked upon a broad consultation process in the fall of 2020. In September, ORSIE's dean participated in virtual Academic Plan consultations hosted by the executive vice-president, Academic, in which students were invited to provide thoughts on how applied research has enhanced their academic experience. Students were also invited to submit feedback via email.

In October, two faculty-focused Strategic Research Plan consultation sessions were held virtually, as well as a session for the applied research team. All were well attended by those actively engaged in applied research as well as those interested in becoming more involved. Two additional sessions were held with faculty members interested in social innovation, an applied research area at DC that has been gaining momentum; these sessions helped identify ways to nurture this area of growth and provide support needed to sustain and further develop expertise.

External partners who have previously engaged with the college on applied research activities were invited to provide feedback via a survey which included an opportunity to comment on research-related priorities and experiences. The feedback received was consistent with that of other stakeholders.

The draft Strategic Research Plan was reviewed by a team of research co-ordinators, as well as ORSIE applied research staff, prior to passing through an approval process by the dean of ORSIE and the executive vice-president, Academic.



GUIDING PRINCIPLES

The following guiding principles help to shape our work by aligning with the institution's strategic documents and providing a foundation for our Strategic Research Plan.

1. Community engagement, collaborative partnerships, and multidisciplinary approaches to research questions on both a local and global scale create synergies and have the greatest impact.
2. Engaging students in research activities provides unique and relevant experiential learning opportunities that enhance network building and transferable skills needed for students to excel in future career paths.
3. Research and intellectual engagement supports professional currency of faculty and informs curriculum development.
4. Research that aligns with principles of equity, diversity and inclusion enhances creativity and supports the economic, cultural and social development of the community.
5. Research, held to the highest ethical standard, that aims to address an identified challenge is fundamental to the academic enterprise.
6. Research and teaching are intrinsically linked and complementary.
7. Ensuring responsible data stewardship, equitable access to data, and active sharing of research outcomes through technology transfer, knowledge mobilization, and translation are essential in order to maximize benefits to society.
8. [Equity, diversity and inclusion principles](#) are integral to the success of the research enterprise, and as such, we recognize the importance of addressing these principles at each stage of the research process and building capacity around these principles.





APPLIED RESEARCH CONCENTRATIONS

Nine research areas representing DC's four research centres and five additional areas of concentrated applied research expertise and activity are identified below. Each align with the college's overarching strategic priorities and the breadth of our academic programs. They also address the existing and emerging areas of need identified by our community and industry partners. We recognize the integral and overlapping nature of each research focus as none exist in a silo, but are often complementary and synergistic.

HUB FOR APPLIED RESEARCH IN ARTIFICIAL INTELLIGENCE FOR BUSINESS SOLUTIONS (AI HUB)

Established in 2017, the AI Hub is DC's first applied research centre. The AI Hub brings together the college's technical expertise, high-tech facilities, and student talent, to conduct applied research activities that leverage AI to provide intelligent and autonomous solutions, increasing productivity and growth for industry partners while training a future workforce. Located in the Centre for Innovation and Research (CIR) at the Oshawa campus, in space dedicated for collaborative applied research, the AI Hub was created with a \$150,000 investment from the college to help build its track record and gain visibility.

Since then, it has received significant funding from Ontario Centres of Excellence, the Natural Sciences and Engineering Research Council of Canada (NSERC), and National Research Council (NRC), and entered into multiple fee-for-service agreements with local municipal and non-profit organizations and industry partners. Over the next five years, the AI Hub will continue to strengthen research capacity with regional companies as well as those beyond the local area, within Canada and internationally, while building additional faculty expertise and related academic programming. All of which will help DC continue to be recognized as a thought leader for its adoption of AI tools and techniques within small- and medium-sized enterprises.

CENTRE FOR CRAFT BREWING INNOVATION (CCBI)

The CCBI was launched in 2018 as DC's second applied research centre. In recognition of a growing business sector within our local economy, the CCBI provides access to expertise, state-of-the-art technology, and micro-analytical services for the craft brewing industry, while enhancing the student experience with exposure to hands-on learning. Craft breweries partner with faculty and students at the CCBI to experiment with new recipes and flavour profiles, propagate and maintain yeast strains, and conduct scientific analyses to ensure the analytical and microbiological integrity of their beer, while leveraging funds, lowering their economic risk and growing their business. Located in the W. Galen Weston Centre for Food at the Whitby campus, the CCBI has benefited from NSERC funding for projects and infrastructure since opening. Over the next five years, the CCBI plans to acquire additional brewing equipment to support a variety of fermentation techniques as well as additional laboratory equipment to expand the range of experimentation and analysis available to local brewers.



MIXED REALITY CAPTURE STUDIO (MRC STUDIO)

DC's third applied research centre was formally announced in early 2020. The MRC Studio was built with a college investment of \$150,000 for equipment and an additional \$100,000 for projects, and now facilitates applied research activities leveraging a state-of-the-art motion capture stage with virtual reality tracking equipment and a green screen. Thanks to an NRC-funded collaboration with Sheridan College, as well as NSERC funding, research teams can develop experiential applications that integrate motion capture, virtual reality, augmented reality, and virtual production, creating solutions that increase an organization's productivity and growth. Vast potential lies in using applied research to develop immersive and interactive simulation scenarios for multiple applications, including training and simulation environments for performance optimization in the skilled trades, healthcare, safety engineering, education, and entertainment sectors. Over the next five years, the MRC Studio plans to build applied research capacity with regional companies within the gaming sector, and build relationships with multisectoral companies in the use of mixed reality for training/simulation and sales/marketing, engage in longer-term and more complex applied research projects, build additional faculty expertise and recruit new faculty experts, and secure field placements and research assistant roles for students.

CENTRE FOR CYBERSECURITY INNOVATION

The Centre for Cybersecurity Innovation is DC's newest applied research centre, launching in 2020. Cybersecurity is the practice of protecting networks and systems connected to the internet by predicting, detecting, and intercepting cyberattacks using technical tools such as firewalls and threat detection services. The Centre for Cybersecurity Innovation, in collaboration with the college's School of Business, IT & Management and Centre for Professional and Part-time Learning, offers current and aspiring cybersecurity professionals and scholars, as well as public and private-sector organizations, the opportunity to engage in applied research projects and leading-edge education in cybersecurity to hone their skills and prepare for the ever-changing, complex threat landscape. Over the next five years, the Centre for Cybersecurity Innovation plans to build applied research capacity with regional companies from multiple sectors, secure state-of-the-art infrastructure to augment our current capacity, engage in longer-term and more complex applied research projects, build faculty expertise and recruit new faculty experts, and secure field placements and research assistant roles for students.

AUTONOMOUS VEHICLE INNOVATION NETWORK (AVIN)

As a member of the provincial AVIN network, DC partnered with the Spark Centre and Ontario Tech University to become the Durham Regional Technology Development Site, advancing automotive technologies and smart mobility solutions. Durham Region's specific focus for applied research activities is on Human Machine Interface and the User Experience. Through AVIN, companies can access expertise and resources to undertake applied research that will lead to advanced automotive technologies and smart mobility solutions, and tap into progressive advice, expertise, and knowledge around key focus areas for the sector.

SOCIAL INNOVATION

Led by faculty and students within our community services, justice, and media, art and design programs, this burgeoning area of creativity and community engagement is flourishing at DC. To date, many socially innovative applied research projects have been carried out that involve community organizations, as well as other academic partners as integral parts of the research team. Whether the focus is using a co-production model to develop new or enhanced social service processes to meet community identified needs, or investigating the usefulness of knowledge mobilization techniques with partners from the early childhood education sector, social innovation projects will continue to be championed at DC. Over the next five years, the college will continue to build its capacity in this important area through collaboration and mentorship, enhancing visibility in the community, while also looking for synergies between work-integrated learning and social innovation.

SUSTAINABLE FOOD SYSTEMS

The college has been steadily building credibility in the area of sustainable food systems by engaging with community agencies and businesses to enhance food-related experiences, address food security for at-risk members of our society, and explore the implementation of sustainable methods of producing food while lessening negative environmental impacts. This applied research concentration leverages existing expertise at DC in the areas of agri-business, culinary management and food science while supporting emerging areas including the development of holistic farming models, urban farming, vertical farming, and artisan food and beverages.

HEALTH AND WELLNESS

DC's applied research activities that address health and wellness cover a wide variety of areas including healthcare, mental health and resilience, physical fitness, physiology, workplace safety, health promotion, nursing, and the use of technological simulations to train health and emergency services professionals. The Collaborative Nursing program, delivered in partnership with Ontario Tech University, prepares students to create and disseminate knowledge about nursing practice and the human experience of health, illness and healing.

ADVANCED MANUFACTURING

DC's expertise in advanced manufacturing techniques and its state-of-the-art facilities contribute to capacity for undertaking applied research that will support innovation and commercialization for small- and medium-sized enterprises. The college's Integrated Manufacturing Centre (IMC) is an industrial-grade teaching, learning and research environment focused on smart technologies, automation, and computerized numerical controls. It enables ground-breaking training and research opportunities for students in DC's engineering technology programs, enhancing the knowledge and expertise of new learners while providing opportunities for continued upskilling within the current workforce.





GOALS

Over the next five years, ORSIE will lead and support the following goals:

GOAL 1:

IMPLEMENT STRATEGIES TO FURTHER DEVELOP AND STRENGTHEN FACULTY RESEARCH CAPABILITIES.

Capacity building activities will be offered to further hone faculty research skills including a faculty mentorship program, professional development workshops focused on research leadership skills, equity, diversity and inclusion principles, and other key research-related skills. Support will also be given to ensure hiring practices include consideration of faculty research capabilities and potential to contribute to DC's applied research agenda.

GOAL 2:

INCREASE RESEARCH TRAINING OPPORTUNITIES FOR STUDENTS TO ENGAGE IN APPLIED RESEARCH PROJECTS BOTH WITHIN AND OUTSIDE CURRICULA.

To ensure research opportunities are visible to all qualified students, a process will be developed to guide hiring committees and ensure student research assistant job postings are shared broadly and are accessible to diverse candidates. A course-based project exemplar will be developed to guide faculty interested in embedding research projects within their curriculum. Enhanced efforts will be made to facilitate links between research projects and curricula as well as support for the development of research courses within existing programs. A new micro-credential for students, aimed at building skills in research, intellectual property literacy, and commercialization, will be explored.





GOAL 3:

ESTABLISH RESEARCH COLLABORATIONS WITH RELEVANT EXTERNAL STAKEHOLDERS.

Faculty members will receive support to explore, initiate and establish partnerships, as well as carry out projects with external partners. These projects will strive to leverage existing field placements and other work integrated learning opportunities as well as applied research funding opportunities with guidance from ORSIE staff.



GOAL 4:

INCREASE THE PROFILE AND AWARENESS OF APPLIED RESEARCH ACTIVITIES ACROSS THE BREADTH OF OUR RESEARCH AREAS BOTH WITHIN AND OUTSIDE OF THE COLLEGE.

A coordinated social media strategy will be developed to encompass the breadth of applied research activity at the college. The research co-ordinator role will continue to be leveraged with increased attendance at Program Advisory Committee meetings for each school to share ongoing activities and research opportunities. ORSIE will also continue to create and broadly share research success stories and opportunities. Efforts will be made to develop tools to engage internal stakeholders in research and ensure faculty participation and achievements are shared and celebrated.



MEASURING IMPACT

DC will measure applied research success to demonstrate the progress of its goals through an annual report on the effectiveness of the Strategic Research Plan. Quantitative measures will include the number of projects per year, faculty engagement as principal investigators or co-investigators, student research training opportunities, number of knowledge mobilization activities, number of external research partners, as well as partner cash and in-kind investments to support funded research. Qualitative outcomes will be measured to assess the impact of completed projects, uptake of new knowledge, incorporation of research into the curriculum, and commercialization activities.

This five-year Strategic Research Plan recognizes the dynamic nature of the research enterprise. It is a living document that will be regularly reviewed by stakeholders and updated as necessary with a complete re-examination at the end of the five years.

PARTNERSHIPS:

ORSIE is proud to work with the following organizations in the local ecosystem:



FUNDING SUPPORT:





INTERESTED IN WORKING WITH ORSIE?

Contact us 905.721.2000 x3223 or appliedresearch@durhamcollege.ca.



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