ADVANCING INCLUSIVE RESEARCH EXCELLENCE

Strategic Research Plan 2025-2030

OntarioTech UNIVERSITY

ADVANCING INCLUSIVE RESEARCH EXCELLENCE

Table of contents

Introduction

Ontario Tech University has, since its founding in 2002, maintained a fundamental commitment to research excellence in answering basic scientific questions, applied and technological innovation, and entrepreneurship. The orientation of this research is toward advancing pure scientific knowledge, technological breakthroughs, improving the quality of life and work for all Canadians, strengthening the quality of public services in Ontario, especially in the sectors of health, education, law and justice, and social policy, working with industry in the commercialization of our research, collaborating with not-for-profits and community organizations, and contributing to the Canadian economy as well as to regional economic and social development in the Greater Toronto Area.

Remarkably, in two decades, Ontario Tech University has created an inclusive, vibrant, engaged research community of faculty and graduate students, built world-class research facilities and libraries, established extensive networks of research partners, provided unmatched research opportunities for our undergraduate students, focused on establishing inclusive bodies such as the Women in Research Council, and invested in a supportive, knowledgeable, professional research services staff. This commitment to innovation and inclusive research excellence has yielded important and impactful outcomes in a wide range of fields.

As the university enters its third decade, it has emerged as a national leader among Canada's smaller research-intensive universities, designated as Canada's Research University of the Year for both 2023 and 2024 among predominantly undergraduate universities by Research InfoSource, the country's premier research ranking organization.

Advancing Inclusive Research Excellence

is a strategic guide for the university to extend its national leadership role in Canada's research community over the next five years. We identify seven strategic research priorities to guide us for the next five years, which are briefly summarized here and expanded upon later in the plan:

Artificial Intelligence and Its Applications

New fundamental research in artificial intelligence and its applications is driving innovation in every sector of society and the economy. Contributing to this research as well as ethical considerations on artificial intelligence remains a fundamental priority at Ontario Tech University.

Canada's Clean Energy Future and Climate Change Resilience

Canada's clean energy future and climate change resilience remains one of the biggest challenges the country has ever faced, with immense economic, environmental and social implications for all Canadians. Ontario Tech's research on clean energy and environmental sustainability is an important contributor to the vision for that future.

Health Promotion, Performance, and Equity

Advancing the health of all Canadians with critical and innovative research addressing health promotion, health education, human performance, and health equity is an important priority for the university. This includes research on chronic and infectious diseases, disability and rehabilitation, mental health, nutrition, drug discovery, behavioural risk factors, physical function and performance, and the social determinants of health.

Autonomous Systems in the Lives of Canadians

Autonomous systems such as smart home devices, assisted-driving vehicles, and robots are playing an increasing role in the lives of Canadians. Ontario Tech is committed to ongoing enabling and ethical research in health care, education, mobility, community living, dementia care, and other applications of the Internet of Things.

Community Well-Being, Justice, and Social Innovation

Innovative research that strengthens community well-being and public-sector institutions including the justice system, schools, cultural organizations, and hospitals is integral to how Ontario Tech defines itself as a research-intensive university.

Entrepreneurship and Business Analytics

Entrepreneurship and commercialization are emerging strengths of Ontario Tech. Integral to this strength is prioritizing business analytics and marketing research, which is focused on the scientific process of transforming data using advanced technology into insights for improving decision-making within business organizations.

Materials and Advanced Manufacturing

In the current climate of global economic uncertainty, strengthening Canada's materials development and advanced manufacturing capacity is key to securing the country's economic future. Ontario Tech prioritizes supporting research partnerships with industry partners to drive the next generation of manufacturing superclusters in innovation, science and economic development.

This new Strategic Research Plan was developed in close collaboration with the Research Committee of Academic Council during the 2024-2025 academic year. The process involved extensive consultation with the university's research community by engaging individual faculty members at Faculty Council sessions and an online shared document feedback platform. There have also been formal consultations with the President, Provost, Senior Leadership Team, Deans, Academic Council, and the Board of Governors.

Professor Les Jacobs, PhD, FRSC, ICD.D
Vice-President, Research and Innovation
Ontario Tech University
May 2025

RESEARCH VALUES AND PRINCIPLES

While academic freedom for researchers is an anchor at Ontario Tech University, we aspire to a code of values, principles, expectations and professional standards that provides a model for all our research community. The impetus for this code is the fact that the university is embedded within a much broader external ecosystem of research and innovation that is instrumental in ensuring our success. This ecosystem includes other universities in Canada and around the world. Major research and innovation funders including agencies of the Government of Canada and the Government of Ontario provide important investments in research capacity and set compliance standards and norms. Many of our researchers are also members of professional bodies and associations with their own professional codes of conduct. Our ecosystem also includes industry, community organizations, not-for-profits, local government, and broader public-sector organizations that are both collaborators and sponsors of our research as well as agents for knowledge sharing and its commercialization.

Ultimately, our research principles and values reflect not only how we fit into this ecosystem but also how our research community distinguishes itself from other research-intensive universities.

Inclusive Research Excellence
Our research aims to be world-class in quality, characterized by scientific rigour and innovation. We believe that equity, diversity, fairness, and inclusion for all members of our research community are integral to achieving inclusive research excellence.

Basic and Applied Research
We are committed to enabling our research community to engage in both basic and applied research across all disciplines.

Tech with a Conscience
Our research seeks to improve the lives of Canadians through an understanding of the ethical, social, and policy effects and implications of innovations and advances in technology, and their potential to enhance community well-being at home and around the world.

Partnership and Collaboration
Our research is built on dynamic and trusting collaborations with industry, government, and community partners.

Entrepreneurship and Innovation
Our research integrates an innovative and entrepreneurial mindset.

Truth and Reconciliation
We recognize that research and innovation at Ontario Tech must respect and advance Truth and Reconciliation with Indigenous Peoples.

Societal Impact
We endeavour to undertake research and innovation that reflects and directly benefits our local communities, contributes to the Canadian economy, strengthens environmental sustainability, and supports community resilience, while having a global reach that places our research on the world stage.


Therapeutic Systems
Base

STRATEGIC ATTRIBUTES FOR INCLUSIVE RESEARCH EXCELLENCE

Ontario Tech University is committed to inclusive research excellence in our efforts to be a world-class research-intensive Canadian university, characterized by high-quality, interdisciplinary, scientifically rigorous, and innovative research activities, programs, and facilities. We believe that equity, diversity, fairness, and inclusion for everyone in our research community are integral to achieving inclusive research excellence at our university.

There are eight core strategic attributes for inclusive research excellence that we have identified as key to the strategic research priorities for the next five years.

Tech with a Conscience

Technology is a tool imagined by humanity to uplift society and our planet. Our ingenuity is our greatest asset. It has allowed us to survive for generations and, if we are purposeful and critical in its development, will empower us to thrive for many more. At Ontario Tech, we strive to improve the lives of humans and the planet through the ethical application of technology and innovation. Technology is inherently human. We intend to keep it that way. We believe that technology is only as ethical as the humans guiding it. We are building a brighter future, where leaders are a force for good and technology is built with human values at its core.

Economic Growth and Prosperity

The research enterprise at Ontario Tech University has an important role to play in economic growth and prosperity locally in Durham Region, the Greater Toronto Area, and the Great Lakes Region, as well as nationally across Canada. It is fundamental that our strategic research priorities reflect that we conduct research that creates knowledge, solves problems, and results in economic and social innovation that strengthens the economy.

Experiential Learning Opportunities for Students

At Ontario Tech, opportunities for so many of our undergraduate and graduate students to participate and contribute to the research and innovation enterprise are foundational to what differentiates us from other Canadian universities. These opportunities include not only paid lab and research assistant roles, but also space for students to undertake their own research projects and commercialize them by setting up their own start-up company or working with an industry partner. Our community and industry partners have unique opportunities to collaborate with our incredibly talented students.

Sustainability

Ontario Tech University is committed to improving climate change resilience and contributing to Canada's goal of achieving net-zero carbon emissions by 2050. We believe strongly that our research on new and emerging technologies, and their ethical limitations, has an important role to play in helping Canada become a leader in sustainability solutions.

Industry Partnerships

Industry partnerships are a key differentiator for Ontario Tech. We have more than 350 industry partners directly working with the university on research projects and more than 250 start-up companies supported through our entrepreneurship programs in the Office of the Vice-President Research and Innovation. These partners provide our students with incredible real-world learning experiences, and our cutting-edge research helps these partners solve industry-specific problems. Growing the research and innovation enterprise requires that we continue to expand our industry partnerships.

Community Engagement and Partnerships

Our faculty and students work collaboratively with diverse community partners to address societal needs in the Greater Toronto Area, across Canada, and around the world. The learning opportunities community engagement provides for our students strengthen their job-readiness with skills in research and innovation. These collaborations are fundamental to Ontario Tech University's commitment to socially just, innovative and impactful work opportunities.

Agile and Nimble

The world is facing immense levels of disruption and change, fueled in part by technological innovation. Ontario Tech excels at being agile and nimble in its responses to new and emerging technologies. The university recognizes the importance of being agile with our industry and community partners, adjusting to changing needs and circumstances. We are responsive to the challenges our partners face and can move quickly to propose viable solutions. As a university, we strive to model this sort of flexibility for our students because we know that this helps equip our students to be more resilient and resourceful in the face of an uncertain future.

Interdisciplinarity

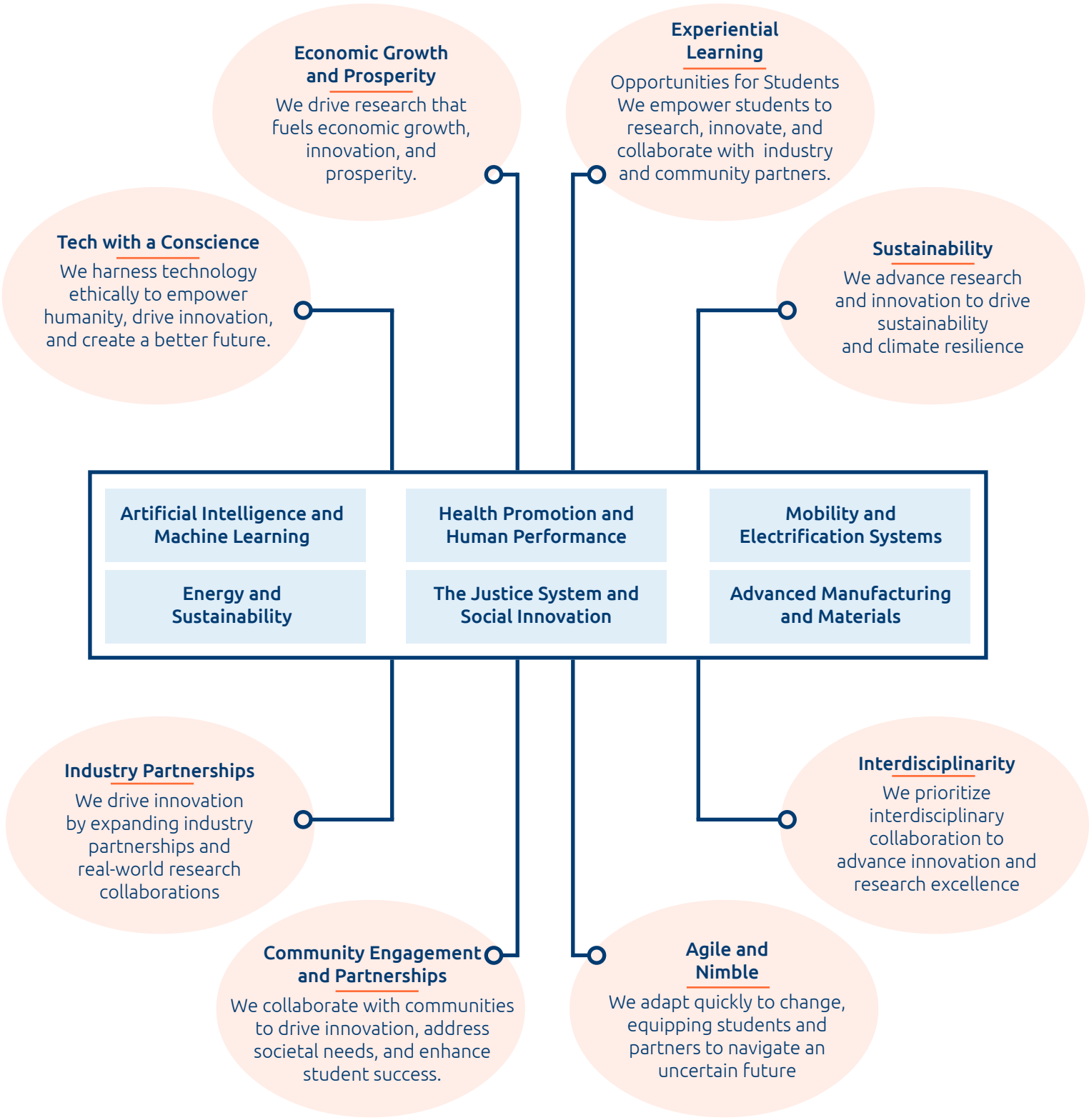
As the research enterprise at Ontario Tech grows, it is fundamental that learning, research, and innovation are not siloed experiences for our students and faculty members. Impactful inclusive research excellence occurs when there is no rigid separation between academic fields and disciplines. It is essential that the strategic research priorities reflect an embrace of this interdisciplinarity, requiring collaboration and the sharing of expertise between faculty and students across the university.

CURRENT STRENGTHS IN BASIC AND APPLIED RESEARCH

Ontario Tech University is currently a national leader in six intersecting fields of multidisciplinary research that are founded on our dual strengths in basic scientific discovery across disciplines and cutting-edge applications of this research in technological breakthroughs, the health and social sciences, engineering, business, and social innovation. Over the past two decades, the university has strategically invested in these six fields of research strength to ensure they mirror our strategic research attributes.

In these fields of research, our researchers stand out in national and international funding and award competitions, secure extensive industry and not-for-profit organization partnerships and sponsorship, and demonstrate research excellence in scholarly outputs such as journal articles and books. The university has built world-class research facilities and libraries in these multidisciplinary fields that enable our research community to undertake their research programs and ensure that those scholarly outputs are discoverable around the world. The university also provides valuable opportunities for the training of graduate and undergraduate students and other highly qualified personnel such as post-doctoral fellows in these research areas of strength.

A Framework for Situating Existing Research Strengths and Strategic Research Priorities Attributes



Artificial Intelligence and Machine Learning

Situated geographically in Canada's technology hub, Ontario Tech faculty members have developed wide-ranging award-winning research programs spanning multiple disciplines from the natural sciences, computer science, business, education, engineering, health sciences, social sciences, and information technology. These research programs exemplify how both pure research in computer science and applied advanced data analysis utilizing artificial intelligence and machine learning is having a transformative effect on almost every field of scientific discovery and applications. This research strength intersects with the fields of all our other research strengths.

Students and post-doctoral fellows from the graduate programs of Business Analytics and Artificial Intelligence, Computer Science, Cybersecurity and Computational Finance, Education and Digital Technologies, Electrical and Computer Engineering, Forensic Psychology, Health Sciences (Health Informatics stream), Information Technology Security, Modelling and Computational Science are key contributors to this research strength along with the many undergraduate students who have research opportunities through their degree programs. These innovative multidisciplinary research contributions create valuable opportunities for the university to train student talent who go on to employment in diverse sectors of the economy in the Greater Toronto Area and other tech hubs.

The university has built an extensive network of laboratories at the Software and Informatics Research Centre (SIR) where this research is carried out including the Advanced Networking and Security Research Laboratory, Applied User Experience Research Lab for Interactive Media, Business Analytics Lab, Clinical Affective Neuroscience Laboratory, Communications, Signal Processing and Microwave Lab, Digital Culture and Media Lab, Education Informatics Lab, Finance and Marketing Lab, the Gaming and Virtual Reality Lab, Hacker Research Laboratory, Health Informatics Laboratory, Institute for Cybersecurity and Resilient Systems, Laboratory for Games and Media Entertainment Research, MaxSIM Health, SAP Next-Gen Labs – Design Thinking, STEAM-3D Maker Lab, and the Visualization for Information Analysis Lab.

Over the past five years, Ontario Tech has invested heavily in strengthening our capacity in artificial intelligence and machine learning. This has included appointments of new Canada Research Chairs and Ontario Tech Research Excellence Chairs that integrate AI into their research programs. It has also involved the creation of new organized research units including the Digital Life Institute, the Joint Research Centre in AI for Health and Wellness, the Mindful Artificial Intelligence Research Institute (MAIRI), and the Centre for Digital Innovation in Education.

At the same time, the university has engaged in major long-term strategic partnerships on grand challenges that reflect our strengths in applications of AI including with the Automotive Manufactures Parts Association for Project Arrow and Project Arrow 2.0, the Advancement for Dementia Care Centre with Ontario Shores, and the Partnership for Advanced Technology in Health Care (PATH) with Lakeridge Health.

.Areas of Research include:

Artificial Intelligence and Education; Augmented and Virtual Reality; Big Data Analytics; Business Analytics and AI; Business Transformation; Computational Science; Computer Vision; Consumer Behaviour; Cybersecurity; Data Visualization and Analytics; Digital Health; Digital Immersive Learning Environments; Digital Learning; Drones; e-Commerce; Ethics and Equity in Technology Use; Financial Analytics; Human Machine Interaction; Human-ability Enhancing Technology; Information and Communication Technologies; Internet of Things; Linguistic Information Visualization; Marketing; Modelling and Games; Neuroscience of Mental Health and Substance Abuse; Next Generation Networks; Operations Modelling; Privacy and Trust; Real-time Stream Processing; Risk in the Global Digital Economy; Robotics; Signal Processing; Software Development and AI; STEAM Education; Technology and Pedagogy; and User Interface Design.

Energy and Sustainability

Ontario Tech is a national leader in research on both energy and sustainability. Our scientists are focused on new basic scientific discoveries and solving fundamental problems in engineering, the natural sciences, and computer science that will help unlock the potential of clean energy technologies and integrated energy systems. Our research strengths include discovering innovative materials and enabling technology that is key to our electrical grid, microgrids, and energy systems in the future. Our faculty members include internationally recognized leaders in developing alternative energy sources. Our researchers have made major scholarly contributions to forms of clean energy such as hydrogen and fuel cells, biofuels, geothermal, and solar. We are leaders in both nuclear energy and nuclear science including small modular reactors, radiation science, radiation health and safety, simulation research, and nuclear materials management. We have outstanding capacity in data management and visualization of energy usage. The university holds a portfolio of patents related to clean energy.

Students and post-doctoral fellows from the graduate programs of Applied Bioscience, Automotive Engineering, Education, Electrical and Computer Engineering, Materials Science, Mechanical Engineering, Nuclear Engineering, and Nuclear Technology are important contributors to this research strength.

The university has world-class facilities where this research is carried out including ACE Climatic Wind Tunnel, Borehole Thermal Energy Storage System, Clean Energy Research Lab (CERL), Centre for Small Modular Reactors, Electrochemical Energy Materials Lab, Energy Research Centre, and Materials Characterization Facility. The university has four Canada Research Chairs and two NSERC Industrial Chairs who focus their research on energy, environmental science, and environmental sustainability.

In the past five years, Ontario Tech has invested in three major initiatives, the International Atomic Energy Agency (IAEA) Collaborating Centre—the only one in Canada—the Brilliant Energy Institute, and the EARTH District to consolidate and provide global visibility to our research strengths in energy and sustainability. These strengths have also been enhanced with new Ontario Tech Research Excellence Chairs.

Areas of Research include:

Biological and Medicinal Chemistry; Biomaterials; Biotechnology; Clean Technology; Computer Modelling; Decommissioning and Site Restoration; Energy and Sustainability Education; Energy Production, Conservation, and Storage; Environmental Impacts; Environmental Monitoring; Fluid-Structure Interaction; Fuel Cells; Hydrogen Production and Storage; Indigenous Governance, Resource Extraction and Free, Prior and Informed Consent; Integrated Energy Systems; International Environmental Governance; Nuclear Energy; Nuclear Materials Management; Radiation Science; Renewable Energy; Smart Grid; Small Modular Reactors; Sustainable Development Strategies; and Transportation and Mobility.

Health Promotion and Human Performance

Ontario Tech University has a very strong network of researchers engaged with community wellness, human performance and health promotion from across the university, including health scientists, psychologists, social scientists, and data scientists. The research areas of strength include Disability and Rehabilitation; Health Education and Simulation; Human Performance; Mental Health; and Nutrition, Physical Activity and Substance Use Risks. This also includes work with vulnerable populations that analyzes best practices in community development and urban resilience, as well as community-engaged research supporting justice-seeking groups, including those with intellectual disabilities, incarcerated youth, Indigenous communities and other vulnerable populations.

In collaboration with a cluster of Research Chairs, this research network includes faculty, students and post-doctoral fellows from the graduate programs in Applied Bioscience, Criminology and Social Justice, Education, Forensic Psychology, Health Sciences, and Nursing.

A hub of labs that are integral to these research strengths include the Applied Skill Acquisition in Sport Lab, Biomolecular Characterization Facility, Centre on Hate, Bias, and Extremism, Clinical Affective Neuroscience Lab, Health and Human Performance Lab, Health Informatics Lab, Human Neurophysiology and Rehabilitation Lab, MaxSim Health Lab, Motor Behaviour and Physical Activity Lab, Neuroimaging and Electroencephalography Lab, Occupational Neuromechanics and Ergonomics Lab, Social Research Centre, and Sport Officiating Studies. Four of the university's Canada Research Chairs work in this research hub.

The capacity for the university's research strengths in health promotion and human performance have been enhanced with new Ontario Tech Research Excellence Chairs as well as the establishment of new organized research units including the Age with Dignity Campus of Care and Best Practices Research Centre, Advancement for Dementia Care Centre, Digital Life Institute, Institute for Disability and Rehabilitation Research, Interdisciplinary Centre for Preventative Nutrition and Technology, and the World Health Organization Collaborating Centre for Rehabilitation and Musculoskeletal Health.

Areas of Research include:

Adapted Physical Activity; Chronic Disease Prevention and Management; Collaboration with Indigenous Communities; Community Development; Community-based Health Care; Digital Health Monitoring; Digital Technology and Learning; Dementia; Disability and Injury Prevention and Rehabilitation; Discovery of Novel Therapeutics to Treat Disease; Early Infectious Diseases and Global Health; Emerging Infectious Diseases and Global Health; Epidemiology; Ergonomics and Biomechanics; Health-Care Simulation; Health Equity; Health Informatics; Health Policy, Systems and Services; Health Promotion; High-Performance Sports; Healthy Aging; Intellectual and Developmental Disabilities; Implementation Science and Knowledge Translation; Indigenous Child Health; Laboratory Medicine; Mental Health and Addiction; Mindfulness; Neuroscience and Motor Control; Nutrition; Pediatric Health; Pandemic Planning; Poverty Reduction; Psychiatric Vulnerabilities; Public Health; Skill Acquisition and Motor Learning; Sleep Science; Social Determinants of Health; Violent Crime Reduction; Waste Water Testing.

Advanced Manufacturing and Materials

Working collaboratively with our extensive network of industry partners, researchers at Ontario Tech University are recognized leaders in manufacturing engineering as well as the synthesis and characterization of materials. Applications of this award-winning research have led to the development of sustainable and environmentally friendly approaches and techniques for manufacturing processes, product development and energy systems. This multidisciplinary research involving both scientists and engineers is transforming manufacturing processes in a range of sectors of the economy in Canada and abroad.

Students from the graduate programs of Applied Bioscience, Automotive Engineering, Computer Science, Electrical and Computer Engineering, Materials Science, Mechanical Engineering, and Modelling and Computational Science are important contributors to this research strength.

Key research facilities that support intelligent manufacturing and materials research at Ontario Tech University include the Advanced Digital Manufacturing, Advanced Digital Metrology, Automotive Centre of Excellence (ACE), Electrochemical Energy Materials Lab, Materials Characterization Centre (MCC), and the Mechatronic and Robotic Systems Laboratory.

The capacity for the university's research strengths in advanced manufacturing and materials has been enhanced with major new organized research units including the Aerodynamic and Climatic Adaptation Research (AeroClimar) Centre and the Advanced Manufacturing Research Centre as well as new Ontario Tech Research Excellence Chairs.

Areas of Research include:

3D Printing; Advanced Robotics; Climatic and Environmental Testing; Corrosion Resistant Coating; Data Storage and Visualization; Digital Twinning; Electronic Materials; Fuel Cells and Electrochemistry; Mechatronics and Automation; Nanotechnology; Noise and Vibration Control; Next Generation Genomics; Software Testing and Simulations; Sustainable Processes; and Surface Science.

Mobility and Electrification Systems

The university has built world-class research facilities in mobility and automotive engineering, including the ACE Climatic Wind Tunnel that has positioned its researchers to be both leaders in mobility research, including electric vehicles and rail transportation, and leaders in new mobility systems including the next generation of cars, buses, trains, drones, and even e-bikes. ACE is one of the university's core research facilities accessible to our entire research community and industry partners. Our close industry collaboration is especially innovative in its recent contributions to electric cars, buses and locomotives, vehicle dynamics and control, advanced powertrains, and aeroacoustics. As a research hub for the Ontario Centre of Innovation focused on human interactions with electric and self-driving vehicles, our industry partners include the leading Silicon Valley automotive original equipment manufacturers (OEM). The graduating talent from Ontario Tech University combined with its globally leading full-scale autonomous and electric vehicle testing infrastructure has made Durham Region one of the world's strongest environments for innovation in mobility.

Students and post-doctoral fellows from the graduate programs of Automotive Engineering, Computer Science, Electrical and Computer Engineering, Information Technology Security, Materials Science, and Mechanical Engineering are important contributors to this research strength.

Over the past five years, in partnership with the Automotive Parts Manufacturers Association (APMA), Ontario Tech has been the academic and prototype build lead for Project Arrow, the first entirely Canadian electric vehicle, which has provided significant visibility across Canada and internationally for our research strengths in this area. The university's positioning as the national leader in hydrogen research has fueled the launch of our unique hydrogen commercialization and prototyping facility.

World-class facilities supporting our research in mobility and electrification systems include the ACE Climatic Wind Tunnel, Clean Energy Research Lab (CERL), Energy Research Centre, and the Software and Informatics Research Centre (SIR). The community engaged in this field of research includes two Canada Research Chairs and several Ontario Tech Research Excellence Chairs.

Areas of Research include:

Assistive Mobility Devices; Assistive Technologies for Learning Different; Autonomous Vehicles; Automotive Dynamics and Control; Automotive LIDAR and Radar; Automotive Structure and Chassis Design; Battery Charge and Storage; Climatic and Environmental Testing; Cybersecurity; Data Ingestion, Analysis and Visualization; Electrification of Transportation Systems; Hydrogen Fuel Cells; Intelligent Mobile Systems; Mobility and Software Testing; Precipitation Characterization; Transit Modelling and Optimization; Vehicle Thermal Aerodynamics and Thermal Management; Vulnerable Road Users; V2X Communication; and Wireless Communication Technologies.

The Justice System and Social Innovation

Ontario Tech University has established a distinctive national research reputation in fields intersecting forensic psychology, legal studies, criminology, and forensic science, addressing the emergence of new technology and social innovation. Anchored by three top-ranked PhD programs, our professors and their graduate students are making impactful research contributions that strengthen the justice system in Canada. Our undergraduate and graduate programs are training highly qualified personnel for industry, government, universities and colleges, and the broader public sector.

Our top-ranked graduate programs that support this research strength include Applied Bioscience (Forensic Bioscience Stream), Criminology and Social Justice, Education and Digital Technologies, Forensic Psychology, Information Technology Security, Materials Science, and Social Practice and Innovation.

The university research facilities that support this cluster of researchers include the Applied Law Enforcement Research and Training Laboratory, Centre on Hate, Bias, and Extremism, Clinical Affective Neuroscience Laboratory for Discovery and Innovation, Crime Scene House, Development, Context and Communication Lab, Entomology Lab, and Forensic Materials Laboratory. Our research strengths are exemplified by the investment in a series of new research chairs including the new Canada Research Chair in Systemic Racism, Technology, and Criminal Justice, UNESCO Chair in Hate Studies, and several Ontario Tech Research Excellence Chairs.

Areas of Research include:

Anti-Social Personality Disorders; Bias in the Justice System; Blood Splatter Patterns; Body Decomposition; Bullying; Child Testimony; Critical Criminology; Cybercrime; Detection of Deception; Emotional Robotics; Hate Crime; Human Trafficking; Investigation Techniques; Law and Community Engagement; Law and Social Change; Online Privacy; Policing; Prosecution and Trial Procedures; Psychopathy; Racial Profiling; Sexual Violence; Technology and Crime Prevention; Technology and Pedagogy; Vulnerable Populations; and Wrongful Conviction.

STRATEGIC RESEARCH PRIORITIES, 2025-2030

The university has set seven specific strategic research priority areas where we aspire to be research leaders by 2030. These priority areas, which are adjacent to and build on our current research strengths, are a reflection of both the major anticipated research funding opportunities – provincially, nationally, and internationally—that will be available to the university and our research partners over the next five years, as well as the research and commercialization needs of our diverse set of partners – industry, community organizations, not-for-profit sector, and governments. These seven priorities will guide decisions about areas for new Canada Research Chairs and Ontario Tech Research Excellence Chairs, investments in new research facilities and other research support resources, grand challenges, industry and community partnerships, and targeted funding opportunities.

All seven of these strategic research priorities align with key strategic attributes Ontario Tech identifies as foundational to inclusive research excellence and our commitment to being the leader among Canada's smaller research-intensive universities. Every faculty—Business and Information Technology, Education, Engineering and Applied Science, Health Sciences, Science, Social Science and Humanities—is reflected in three or more of these priorities.

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Artificial Intelligence and Its Applications

New research in artificial intelligence and its application is driving innovation, while at the same time creating risk and mistrust, in all sectors of the economy. The use of generative AI is revolutionizing diverse sectors of Canadian society ranging from cybersecurity and gaming to public education and health care. The integration of our existing capacities in fundamental AI research, related emerging technologies, software testing, as well as enabling technologies, and immersive technologies such as augmented reality, wearables, robots, games, digital and virtual simulations, and custom chatbots are important strengths to build on. At the same time, we also focus on ethical considerations of AI such as the risk of racial bias and social exclusion. Consistent with our concern with sustainability and clean energy, we also value research on the disruptive and environmentally destructive potential of the AI revolution. The broad area of AI research remains a fundamental priority at Ontario Tech University.

Canada's Clean Energy Future and Climate Change Resilience

Canada's transition to a net-zero energy future remains one of the biggest challenges the country has ever faced, with immense economic, environmental and social implications for all Canadians. The effects of climate change and resiliency underpin this challenge. Meeting this challenge will require massive new investment in our energy infrastructure and realignment of public policy. It requires new thinking that reaches beyond research and jurisdictional silos and integrates advances in the natural sciences and engineering, computer and computational science, business and the digital economy, health sciences, and the social sciences. This vision must reflect our commitment to Truth and Reconciliation and engagement with Indigenous Peoples—where the environment is essential to our well-being and all of us are caretakers of the planet. Ontario Tech University, with its immense research strength in energy, applied bioscience, environmental sustainability, community engagement, and digital technology has an important role in contributing to this vision.

Health Promotion, Performance, and Equity

Advancing the health of all Canadians with critical and innovative research addressing health promotion, health education, human performance, and health equity is an important priority for the university. We prioritize chronic disease prevention and management, and rehabilitation by considering a range of conditions and behavioural risk factors across the lifespan and in multiple settings where people live, work and play. Our research also includes drug discovery and infectious diseases, and it places emphasis on research related to nutrition, dementia, disability, mental health, and the social determinants of health. Furthermore, we prioritize optimizing performance and well-being across the spectrum of 'ability'. This includes optimizing physical function and performance for people of all abilities.

Autonomous Systems in the Lives of Canadians

Autonomous systems such as smart home devices, assisted-driving vehicles, and robots are playing an increasing role in the lives of Canadians. With our advanced testing and research labs and facilities, we are well-positioned to develop and evaluate these systems and their real-world impacts. Ontario Tech is especially committed to autonomous systems and embedded systems research in health care, education, supply chains, manufacturing, telecommunications, business analytics, mobility, community living, rehabilitation, and dementia care settings. Ensuring that these autonomous systems are ethical, resilient, and secure from cyber threats are key concerns for the university.

Community Well-Being, Justice, and Social Innovation

Ontario Tech University has a national research reputation in fields intersecting psychology, neuroscience, criminology, law, communications, environmental sciences, and forensic science addressing societal change, social justice, and social innovation, as well as the emergence of new technology. Our researchers also work within education spaces to explore leadership, play and inquiry, science, technology, engineering, and mathematics innovations while promoting equity and inclusion. Research that conserves environmental ecosystems, addresses social isolation and marginalization, and sustains public sector institutions including the justice system, social services, schools, and hospitals is integral to how Ontario Tech defines itself as a research-intensive university.

Entrepreneurship and Business Analytics

Entrepreneurship and commercialization of research are emerging strengths of Ontario Tech University. Prioritizing business analytics research, which is focused on the scientific process of transforming data into insights for improving decision-making within business organizations, is an important investment in building this strength. Researchers use a variety of advanced computational and statistical methods to investigate problems in marketing, finance, human resources, strategic management, and operations.

Materials and Advanced Manufacturing

In a climate of global economic uncertainty, strengthening Canada's advanced manufacturing capacity is key to securing the country's economic future. Research at the university has always positioned itself as an important contributor to materials development and advanced manufacturing. Disruptive and emerging technologies are creating new opportunities to expand these contributions. The integration of intelligent and autonomous technologies that utilize artificial intelligence and machine learning for advanced manufacturing and cyber-physical systems is a research priority for the university, allowing us to build on current research strengths to establish ourselves as a leader in manufacturing and materials innovation. We prioritize supporting our industry partners as key contributors to the next generation of manufacturing superclusters in innovation, science and economic development.

The strength of each of these seven priorities in terms of the KEY strategic attributes for inclusive research excellence are represented in the matrix below:

Strategic Priority	Key Strategic Attribute							
	Tech with a Conscience	Economic Growth and Prosperity	Experiential Learning Opportunities for Students	Sustain-ability	Industry Partner-ships	Community Engagement and Partnerships	Agile and Nimble	Inter-disciplinary
Artificial Intelligence and Its Applications	◆	◆	◆	◆	◆	◆	◆	◆
Canada's Clean Energy Future	◆	◆	◆	◆	◆	◆	◆	◆
Health Promotion, Performance, and Equity	◆	◆	◆	◆	◆	◆	◆	◆
Autonomous Systems in the Lives of Canadians	◆	◆	◆	◆	◆	◆	◆	◆
Community Well-Being, Justice, and Social Innovation	◆	◆	◆	◆	◇	◆	◆	◆
Entrepreneurship and Business Analytics	◆	◆	◆	◆	◆	◆	◆	◆
Materials and Advanced Manufacturing	◆	◆	◆	◆	◆	◇	◆	◆

◆ - Very strong ◇ - Strong

MEASURING AND REPORTING ON OUR SUCCESS

In co-ordination with the Integrated Academic Research Plan, the university has developed fourteen metrics to measure our research enterprise:

- EDI Commitments and Initiatives
- Entrepreneurship and Commercialization
- External Research Partnerships and Sponsorships
- Graduate and Undergraduate Research Funding/Financial Support
- Graduate Student Enrolment (Actual and Proportion)
- Research Intensity and Ranking
- Ontario Tech Research Funding Awarded and Major Awards Received
- Local Partnerships and Opportunities
- Postdoctoral Fellowships
- Research Entities and Chairs

Annually, the Vice-President, Research and Innovation will provide a report card to Academic Council and the Board of Governors on the progress we have made on these fourteen metrics, as well as examples of our achievements on the Strategic Research Priorities.

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