

**UNIVERSITY PLANNING COMMITTEE
Wednesday, January 8, 2025 at 10:30 AM
Council Room (GH-111)**

AGENDA

Page

OPEN SESSION

1. **Notice of Meeting - December 13, 2024** (10:30 a.m.)
2. **Approval of Agenda** (10:30 a.m.)
3. **Business Arising** (10:30 a.m.)
4. **Minutes of the Previous Meeting – December 4, 2024 (Open Session)** (10:30 a.m.)

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5. **Chair's Comments and Update** (10:35 a.m.)
6. **Report from University Technology Services** (10:50 a.m.)

G. Gray
Information

8 - 23

[Report from University Technology Services](#)

7. **Report from the Faculty of Engineering** (11:00 a.m.)

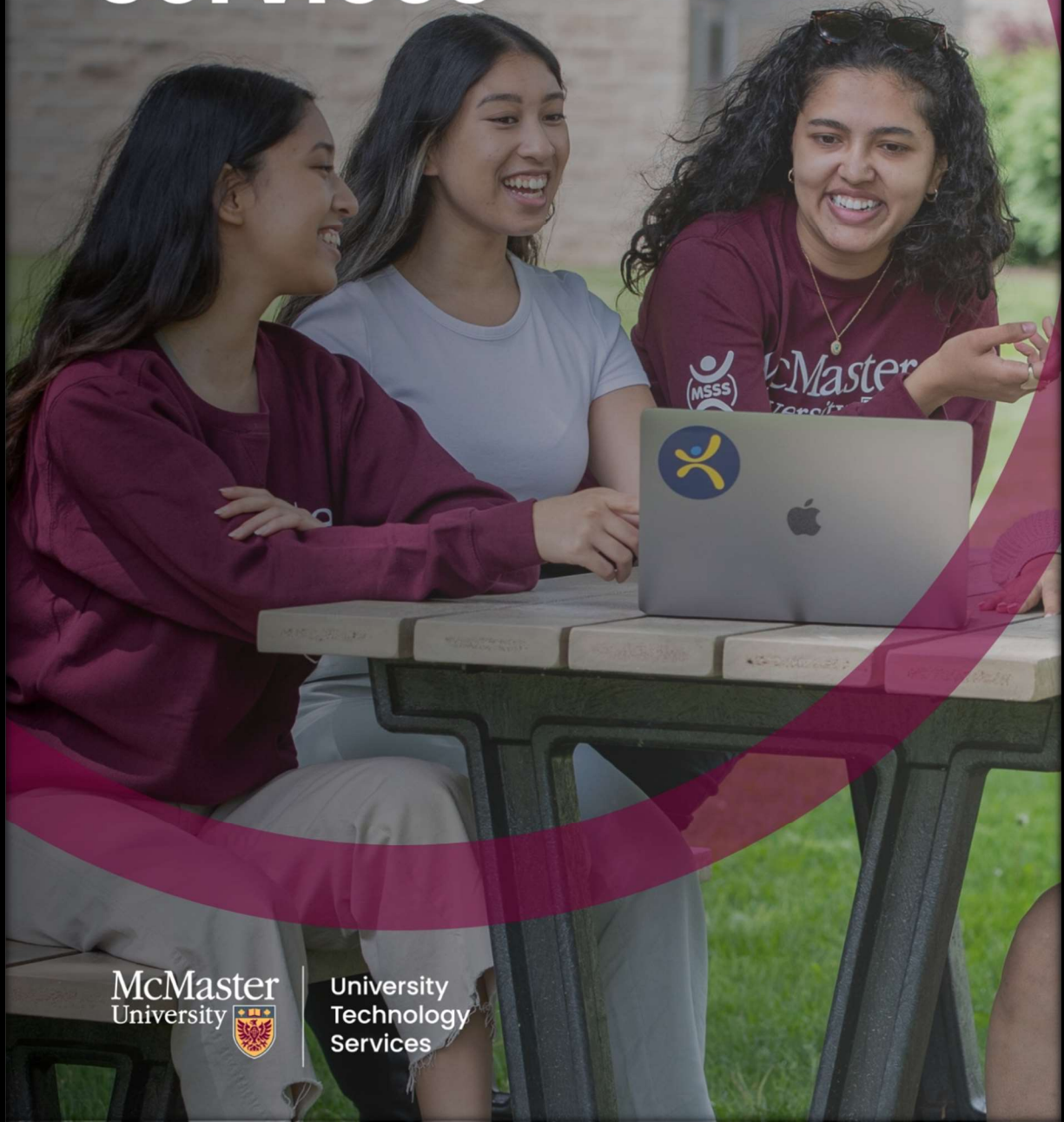
H. Sheardown
Information

24 - 37

[Report from the Faculty of Engineering](#)

8. **Other Business** (11:20 a.m.)

University Technology Services



McMaster
University 

University
Technology
Services



Gayleen Gray

Associate Vice President and Chief Technology Officer
(AVP and CTO)

The Office of the AVP and CTO, and University Technology Services (UTS)

Vision

Working as a connected community, McMaster will deliver a seamless foundation of core and transformative information technologies and services, accelerating the university's teaching, learning, and research mission.

Overview

The AVP and CTO has offered institutional leadership, partnership and support for various key institutional activities that will continue to provide future ready technology services to the campus, including: the Master Data Strategy, Web Strategy 2.0, a new Data Centre strategy, the digital student experience Campus Relationship Management (CRM) initiative, key CRM implementations for HR and recruitment, One Card (MacCard) strategy, McMaster LIMS for Core Facilities, the Digital Research Commons and the more recent responsibility for RHPCS, and support for the Vice Provost Teaching and Learning's Digital Learning Strategy. In the context of current financial challenges, these goals align with our 'one university' vision by driving efficiency and coordination in areas essential to our success: data driven decision making, student success, and cost savings.

Of note, in 2024, the Office of the AVP and CTO launched [MacITGo](#), a new IT navigation consultation service empowering departments across campus to achieve strategic goals driven by technology. The McMaster IT Governance framework and approach was also optimized, enhancing collaboration and planning for institution-wide IT initiatives. Together, these accomplishments highlight the power of working as one connected community., enhancing collaboration and planning for institution-wide IT initiatives. Together, these accomplishments highlight the power of working as one connected community.

As is the norm, there were many emerging and priority activities that competed for our team's attention this past year: the emergence and advancement of generative AI (artificial intelligence), the new AI Advisory Committee, the required AOPDA Web Accessibility compliance reporting, the transition of Research High Performance Computing Support (RHPCS) to the Office of the AVP & CTO, the roll out of IT services and support for the Nuclear Operations Facility, a campus wide IT Services Review, and continuously emerging opportunities and changes within the Microsoft productivity suite. Each their own way provided excitement and challenges and will continue to offer opportunities in the year ahead.

AVP and CTO Strategies



Priorities

The AVP and CTO office focuses on advancing key priorities for the institution, including IT Governance, support for enterprise level IT initiatives led by other leaders and teams, CTO sponsorship for project management, business analysis and operational support for all aspects of campus IT.

These are key strategies of note for which the AVP and CTO will be providing support through the next fiscal year:

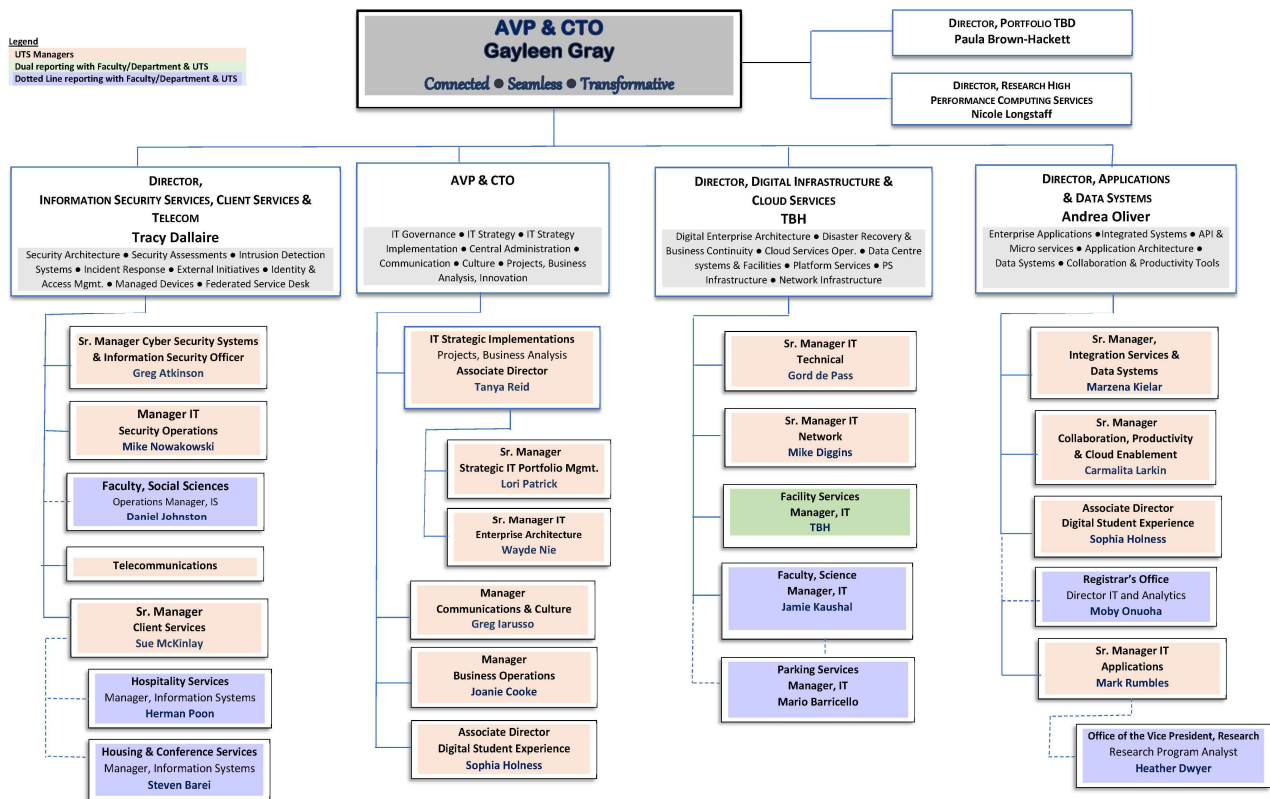
- The McMaster One Card roll out in support of the AVP Real Estate and Ancillaries
- The Digital Student Experience Campus Relationship Management (CRM) initiative and other key CRM implementations including those for Human Resources, Housing and Conference Services and Communications, Marketing and Public Relations
- The Data Centre Strategy which will be socialized before the end of FY 2024/25 Web Strategy 2.0 in partnership with the AVP Real Estate and Ancillaries and Chief Executive, Internal and External Relations
- Operationalization of the Web Accessibility for Ontarians with Disabilities processes on campus
- The Research Commons in partnership with the Vice President Research and the University Librarian
- The McMaster LIMS for Core Facilities, in partnership with the VPR
- The Digital Learning Strategy in support of MacPherson Institute
- The Smart Campus Strategy in partnership with Facility Services
- The AI Advisory Committee and its cross-campus activities
- The campus IT career framework and position management, along with IT Services Review operational IT focused recommendations including extending IT Leadership support across departments and Faculties
- Ongoing support and delivery of McMaster IT Governance 2.0 and MacITGO Navigation Services

Highlights for University Technology Services (UTS) and Research and High-Performance Computing Support (RHPCS)

The AVP and CTO oversees the central IT department, UTS, as well as Research High Performance Computing Services (RHPCS), with each area of services led by Directors who oversee their portfolio of Senior Managers and staff, as outlined in the Organizational Chart above. UTS provides project support and systems integrations while simultaneously delivering strategic and operational services in support of the institution's needs.

The following sections will provide more detail on each of the units that roll up to the AVP and CTO.

Jan 2025



Information Security Services and Client Services

Client Services

Providing McMaster with transformative information technologies and services depends on a cohesive and aligned IT community across the full institution, and a strong IT culture. Delivering exceptional service and maintaining a commitment to core technologies and innovative solutions will result from an enterprise service management approach where an integrated IT support services model will mature and grow that leverages the best organizational structures and delivery sources.

Client Services in UTS provides front line support for information technology services within the university.

- Although IT service delivery is decentralized, the UTS Service Desk provides the central support for account management, central Mosaic and application services, networks, servers, IT security, and collaboration tools (Microsoft Office and Zoom).
- The UTS Service Desk support model has been evolving with greater integrations and alignment of processes and technologies between those provided by UTS and those provided by Faculty IT and other decentralized IT areas.
- UTS front line support personnel provide value to students, faculty/instructors, staff, and researchers, as well as those external to the institution, and they support services that cross all constituencies or affiliations including UTS services and non UTS systems like Avenue2Learn, LinkedIn Learning, and others.
- Continuing into 2025 – 2026, Client Services is undertaking a modernization effort in collaboration with Faculty and other decentralized IT areas with the move to Microsoft Dynamics, a Campus Relationship Management (CRM) tool. This move will also align client service technologies and approaches with other non-IT support areas such as the Registrar’s Office and Human Resources.

Additional Trends:

We receive emails, phones calls and chats requesting support and new services. We provide this service successfully, based on our customer satisfaction ratings. Our customer satisfaction rating for 2024 is 4.8/5.

- Since the implementation of Live Chat and Chat Bot features in 2022, the community has continuously increased their use of these support channels. The Live Chat and Chat Bot feature is also integrated with other Live Chat and Chat Bot implementations across campus for IT and non-IT services and support. In addition to online services, staff, students and faculty can book in-person consultations at the UTS Service Desk in Burke Sciences through an online queue system established post-COVID. This convenient option has been well-received and frequently used by students.

The UTS Service Desk is a key point of interaction and evolves around continuous improvement. Total UTS Service Desk interactions have increased more than 10% in volume each year across Live Chat, email and telephone because of the enhanced services offered by the team and extended support hours, by 26 hours per week over the fall and winter semesters:

Statistics for 2024 Client Services

Tickets Created (grand total)		Chats (Bot and Agent)	Walk -Ins	Total
2024 (as of Nov 2024)	19,836	28,346	997	55,440
2023	22,908	32,526	1,151	56,585
2022	27,006	30,534	1,045	58,585
2021	27,736	34,097		61,833
2020	34,741	5,908		40,649
2019	30,457	n/a		30,457
2018	30,634	n/a		30,634

Client Services Strategies

By moving toward an IT One-Desk or Enterprise Service Management approach, we will improve efficiency and excellence in customer service, making it easier for our community to engage and get the services they need more effectively and efficiently. The community will not need to determine where to go and who to contact to get IT assistance.

To enable a *Connected, One IT Community*, Client Services has been focusing on four improvement opportunities:

1. Automation, data and analytics, systems integration and customer service;
2. Improving Data and Analytics that inform changes and improvements to service provision;
3. Increased Systems Integrations including websites, chats, ticketing and social medial channels, as well as other Institutional systems such as Mosaic, Identity and Access Management and other related systems;
4. Efforts to continually improve Customer Service creating a customer experience strategy, vision and training plan.

Client Services is undertaking an Enterprise Service Management modernization effort to migrate the Client Service technology and associated processes and approach from a traditional ticket model to a relationship management model with move to the Microsoft Dynamics CRM platform. This approach will align client facing services and supports with other institutional IT and non-IT supports and enable future integrated approaches to client services.

Additionally, since the last report in 2022, work commenced and will continue in earnest in 2024-2025, to improve and integrate desktop support services in collaboration with Faculty and other service areas across campus. This group will also collaborate on modernizing and improving end point management which will improve the service experience for staff and faculty and result in better service delivery, efficiencies and improved information security.

Information Security Services

The Information Security Services team implements security safeguards across campus and ensures they are operating effectively. These safeguards allow for the prediction, prevention, detection and response to security incidents and threats.

Information Security Services provides these services through a team of IT professionals and an extended team of IT professionals in the decentralized IT areas, focused on:

- Security operations monitoring and response to any threats and alerts.
- Supporting end users with security related issues
- Identity and Access Management with Single Sign On
- Proactive Security Reviews and Scans of contracts and agreements, existing and new systems, project implementations, payment processing and networks
- Providing awareness resources and supports to students, researchers, staff and faculty

Information Security Services developed a Three-Year Information Security Strategy and Road Map intended to mature services that will strengthen McMaster's security posture and build its resilience in an ever-changing threat landscape and will come to completion in 2025. In the Winter of 2025, in response to the recommendations in the IT Services Review and with the completion of the initial year Three Road Map, Information Security Services will provide a new continuous improvement plan and road map for the full campus. This will provide a campus wide approach to the following operational activities:

- Day-to-day security operational services to the McMaster community
- Identify and Access Management Program
- Effective governance, risk and controls efforts are undertaken
- Support for projects and initiatives across all areas of the Institution
- Proactive and reactive activities to ensure the security systems, networks, data, and information
- Coordination and collaboration to ensure a resilient and strong technology and business ecosystem.

Information Security Services Road Map Priorities, Accomplishments and Highlights

The following provides a summary of the priorities for the coming year:

- Advancing End Point Protection across the McMaster Network:
 - *Priorities:* Continued tuning and risk-based deployment of end point protection controls
- Strengthening information security across the McMaster Network:
 - *Priorities:* Assessing, identification and implementation of additional and new network safeguards
- Enhancing Information Security Incident and Event Monitoring and Management (SIEM):
 - Undertaking a SIEM proof of concept and sector SIEM initiative
- Ensuring effective Identity and Access Management (IAM) Program and Single Sign On (SSO) services
 - *Priorities:* Modernize and improve IAM addressing problems, streamlining and automating processes and increasing flexibility and agility
- Growing supports for the McMaster Research Community with resources and supports to enable and support Research and Scholarship:
 - *Priorities:* Development and implementation of IS standards, protocols and assessments
- Providing Governance and Guidance to support end users as they work, learn, teach and research:

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- *Priorities:* Modernize information security policies, standards, governance bodies and processes
 - Streamlining and growing IS Architecture and IS Review processes and resources:
 - *Priorities:* Mature and enable self-serve assessment tools and processes
 - Information Security Culture building:
 - *Priorities:* Mature and increase impact of IS Culture building through virtual and in person training and awareness campaigns.
 - Establishing and automating a Dashboard of Key Performance and Key Risk Information Security Indicators *Priorities:* Harmonizing and automating development and maintenance of IS dashboards
 - Maturing McMaster's Incident Response (IR) Program:
 - *Priorities:* Develop and delivery annual plan of tabletop exercise Explore and implement IR automations.

Digital Infrastructure and Cloud Services

Recently renamed to address the future readiness activities necessary for delivering a 21st century digital infrastructure, this unit maintains and manages several core services including:

- Wired and Wireless Networking
- Enterprise Architecture
- Cloud Services & Operations
- Data Centre Management (2 McMaster Core Data Centers)
- Platform Services
- Server and Storage hosting
- Disaster Recovery backup
- People Soft Infrastructure
- Database Platforms and Database Management

We work to minimize the infrastructure on premises where possible and when it makes sense to move to cloud services, evaluating operational feasibility and fiscally responsible. This will allow us to manage the resource requirements for people and physical space as new and expanding services are introduced. There is a priority to leverage new technology like AI and machine learning to better manage our growing infrastructure and to seek creative and innovative ways to manage and enhance McMaster's core infrastructure.

The following is a list of short-term priorities for each of the infrastructure areas:

People Soft infrastructure & Database Platform Management

- **Note:** *Objective is to have all Oracle workloads in Oracle Cloud (OCI) and remove the on-premises system before the Oracle Contract is up for renewal in June 2025*
- All Mosaic platforms moving to Oracle Cloud Infrastructure
- Oracle Cloud Manager on OCI in new tenancy (ExaCC)
- Establish Proper Patching Strategy (Lifecycle) for all things Oracle based on quarterly critical patches released by Oracle

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- Oracle Application (PeopleSoft) contract renewal/review
 - System Upgrades – Maintenance of technical currency:
 - Oracle DB Version Upgrade to 19c
 - People Tools Upgrades (8.58 to 8.62 in 2025)
 - Image (PUM) Upgrades for CS, FS & HR (Lifecycle) - 2025
 - POC – Start moving PeopleSoft non prod Environments to OCI including associated infrastructure such as attachments and photo storage
 - IRA – OBIEE & ODI/OBIA replaced with Oracle cloud OCA & ODI
 - IAM Moved to OCI
 - Hyperion move to OCI
 - Replacement of ExaCC Machine on prem at McMaster with new ExaCS Machine in Oracle Montreal Data Centre as part of our tenancy
 - Future Disaster Recovery site in Montreal Tenant

Telecommunications

The Telecommunications team works to continuously improve the campus integrated communications services capabilities and more recent modernization activities include:

- Reconfiguration of dial plan to exclude Legacy Nortel Systems
- Upgrade of Avaya Aura OS from release 7 to release 10.2:
 - Includes upgraded HW (e.g., S8300 modules for all the gateways).
- Physical disposal of Legacy Nortel Hardware
- Replacement of Nuance Speech Attendant System
- Integration of Avaya Aura with MS Teams
- Upgrade of the Emergency Phones (blue phones located in the Poles) Tool Vox – Collaborative project with Security

In 2025 – 2026, the campus will move away from the cost recovery model that has been at the core of the Telecommunications budget model since it was an ancillary service over a decade ago. This will rejuvenate the service model approach offered to the campus, providing more opportunity to provide agile services to faculty and staff based on specific needs and productivity approaches. To address this shift in client productivity focus, the team will undertake efforts to advance towards a more seamless client service experience in coordination and collaboration with client services areas such as the service desk, desktop support and end point management within UTS and across IT areas that support our campus. Further, the Telecommunications team will be embarking on a transformational exercise to move towards a more streamlined and modernized approach through the implementation of TEAMS Voice Calling.

Network – Wired & Wireless

Seamless, secure and innovative network solutions that empower academic, research and operational excellence across campus are core to all technology and service capabilities on campus. To build a resilient, future-ready network infrastructure that supports the evolving needs of our campus community, this team focuses on:

- Modernizing Wired and Wireless Networks: Enhance building networks through a multi-year lifecycle management strategy, ensuring scalability and continuity by proactively addressing vendor end-of-life challenges.
- Advancing Wireless Connectivity: Transition to Wi-Fi 6E and beyond (Wi-Fi7), deploying next-generation wireless access points and piloting cutting-edge technologies like 6GHz Wi-Fi in strategic locations.
- Empowering Innovation: Implement a secure wireless IoT onboarding solution to support diverse research, security, and building automation needs.
- Enhancing Core Network Infrastructure: Upgrade the Nexus Data Center switch to accommodate higher port capacities, meeting the demands for speeds beyond 1Gbps and addressing end-of-life challenges.
- Expanding Campus Connectivity: Improve student residence networks with updated switching and Wi-Fi 6 technologies while addressing aging fibre infrastructure and redundancy gaps.
- Sustaining Excellence: Renew critical enterprise agreements, enabling continued support for wireless operations, advanced analytics, and network automation.
- Ensuring Robustness: Conduct external network audits and assessments to identify and address vulnerabilities, ensuring a secure and efficient campus network.

Further initiatives in the next year or more will include:

- Life Cycle Management (Asset Management)
 - Multi-year project to enhance building networks and avoid vendor end-of-life issues (no provisioning of parts, services, or software support for current hardware)
 - Wireless enhancements to Wi-Fi 6 and beyond (approximately 500 replacement wireless access points deployed for phase I)
 - Replace Nexus Data Center switch with new platform – addressing the need for more port capacity beyond 1Gbps (1/2.5/5/10/40/100)
- Wireless IoT onboarding solution needed so that staff and researchers can securely attach atypical devices to Wireless network (for research, security, building automation, etc.)
- Trial 6GHz Wi-Fi (Wi-Fi 6E) in the libraries (or another location)
- Renewal of multiyear Cisco wireless Enterprise Agreement (EA) for continued support (controller licensing, DNA Centre, and DNA spaces cloud service)
- Resnet (Student Residences) network enhancements – five remaining buildings updated with enhanced network switch and Wi-Fi6 technology
- Address aging fibre cable plant (single mode fibre to Campus Services, Applied Dynamics Lab:
- External Network Audit and Assessment

Architecture & Infrastructure (Enterprise Systems)

- Initiate an Architecture practice within the Strategic Implementations team of the Office of Associate Vice-President & Chief Technology Officer
- Transition to hybrid premise and cloud services capability for Azure and OCI clouds
- Complete decommissioning of Compellent Storage

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- MacDrive refresh or transition (technical currency / seamless)
 - Replacement of Datacentre UPS and cooling and broader Campus Datacentre Roadmap
 - Develop and implement Campus Web Strategy
 - Migrate from Fibre Channel Storage Network to iSCSI/Ethernet
 - Future Mosaic hosting architecture

Enterprise Applications and Data Systems (EADS) and Collaboration and Productivity:

Enterprise Applications and Data System

The Enterprise Applications and Data Systems team provides services that:

- Ensure the availability, sustainability, and security of the institution's mission-critical Enterprise Resource Planning (ERP - Mosaic) system delivered in Oracle PeopleSoft that supports central Finance, Human Resources, and Campus Solutions.
- Builds and supports seamless data integrations between the ERP system and other campus enterprise applications including student applications systems, client relationship management systems, the Learning Management System, administrative management systems, and all adjunct financial and budget systems.
- Supports access to data for decision making including the provision of reporting tools and support for data platforms, data governance, data security and data privacy.

Enterprise Applications and Data Systems has a three-year operational plan with a prioritized set of large-scale initiatives that will continue into 2025. The outcomes and deliverables from these initiatives are scoped and planned to achieve key objectives identified in strategic and operational plans such as the President's Strategic Plan which include the following priority areas which are intended to modernize and transform the enterprise application and data technology platforms and services for the institution.

Data Management & Reporting:

- Modernize data platform by decommissioning the legacy/unsupported data warehouse.
- Implement Microsoft Azure cloud-based data platform for hosting and supporting self-service reporting and analytics, including unstructured and semi-structured data.
- Expand self-service reporting tools and access to operational data for administrative and faculty users.
- Provide data governance support for ensuring data quality, literacy, and standards.

Integrations & Application Development:

- Modernize systems integration to the ERP system using standardized Application Programming Interfaces (APIs).
 - Complete proof of concept to develop and operate the environment.
 - Review/assess current integrations to inform a strategy for replacing legacy integrations.
- Expand low-code/no-code application development for developing bespoke/ non-ERP technology solutions.

Enterprise Resource Planning (Mosaic):

- Lifecycle Management for ensuring that the system is maintained in a state of good repair
- Oracle Roadmap Implementation has commenced
 - Successfully decommissioned the Mosaic Interaction Hub (Portal) to reduce the Mosaic technology footprint and overall cost. (Q1-2024)
 - Migration of Mosaic database from on-premises to Oracle Cloud Infrastructure (started)
 - Mosaic Upgrades - PeopleTools and Image Updates (User interface improvements and system enhancements)

Provide Enhanced User/Customer Experience:

- 2,100 incidents, bug fixes, and enhancements resolved
- 475 Mosaic system changes implemented to Mosaic Production environment
- Leverage delivered enhancements to PeopleSoft (Mosaic) as part of Oracle Roadmap Mosaic Upgrades
- Leverage API Management tool to facilitate enhanced user experience (Chatbot, SharePoint).

Digitization and Automation:

- Continuation of the successful eForms program:
 - Teaching Assistant Hire eForm implementation
 - Employee Self Service enhancement implementation
 - HR New Hire (Phase 2) - Planning
 - Grad Pay project - Started
 - Grad Records project - Planning
- Health & Safety Training Compliance Initiative:
 - Improve training enrollment automation- Started

Consultative Services:

Consultative technical and project management support for major business-led technology initiatives including technical reviews for major projects and systems upgrades with representatives and subject matter experts including IT and business areas:

- McMaster One Card Project
- Finance Hyperion budget planning replacement project
- McMaster CRM Transformation
- University Advancement specific CRM implementation
- Infosilem (Course Scheduling) system replacement project
- Data Strategy Phase One project
- Bike Share project
- Campus Store POS project
- Verifiable Digital Diploma project
- Record of Activity (ROA) – grants data integration for Faculty of Science

Collaboration and Productivity Services

McMaster's academic and administrative activities rely on collaborative and informed decision-making. Our investments in platforms and processes will prioritize implementing solutions already identified as core requirements. This approach will also create opportunities to discover and implement new initiatives that support McMaster's ongoing digitalization. We deliver and manage services and product changes for the broad McMaster Community:

- Microsoft 365 portfolio
 - Microsoft tenant licensing
 - Policies
 - Microsoft 365 suite of products
 - Microsoft Exchange email service
 - Microsoft SharePoint service
 - Microsoft OneDrive
 - Microsoft Teams
 - Third-party applications integration
- Zoom service
- IT service management tool
- DocuSign service

Collaboration, Productivity & Cloud Enablement Priorities:

- Engage with community partners to assess needs and identify opportunities for operational efficiency
- Automate and streamline operational processes
- Simplify the email ecosystem to enhance security and introduce new services and capabilities
- Increase adoption of collaboration services such as Microsoft 365 and Zoom
- Introduce new capabilities, such as email archiving
- Enhance the security posture of existing services, including email quarantine and shared mailboxes (underway)
- Decommission services where there is duplication of effort or capability
- Leverage new capabilities in existing tools and services
- Migrate mailing lists from the Electronic Distribution List (EDL) tool to Microsoft (underway)

What's trending - statistics:

Discover & Learn educational site has 31,000 unique users

OneDrive contains 146.8 million files

SharePoint sites contain 39.1 million files

Over the past 6 months:

Exchange service had 85.5 million emails activities

MS Team had 10.8 million chats activities

MS Teams had 251,000 meetings 91,000 were one-on-one calls

Zoom had 248,300 meetings/webinars

Microsoft Copilot (enterprise data protection) had 2,921 active users with 92 average daily users

Research High Performance Computing Support

The Research and High Performance Computing Support (RHPCS) team at McMaster University is dedicated to supporting the computational and digital research infrastructure needs of researchers across all disciplines. RHPCS provides McMaster researchers with computing resources, technology expertise and consultative competencies to advance innovative research and achieve researchers' project goals. Whether through direct provision of infrastructure and services, or by coordinating and consulting with other partners and solution providers on and off campus, RHPCS is committed to ensuring researchers access the best possible resources, tools, and support. To fulfill this mission, RHPCS currently offers a comprehensive range of services tailored to meet the diverse needs of McMaster researchers.

As of FY 2024/2025, the AVP and CTO is responsible for RHPCS. However, it will remain a separate department from UTS, with separate budgets, personnel, and mandates, while simultaneously seeking synergies and collaboration. It may take up to two years to revitalize and right size RHPCS and its funding to appropriately meet researcher needs, however the involvement of both the Vice President Research and office, along with input from researchers across the institution will provide valuable support. The opportunities that will be created through the leadership efforts of the AVP and CTO and the VPR will provide a foundation for RHPCS to:

- Facilitate thoughtful investment in infrastructure, innovation, and skills development.
- Differentiate RHPCS services, offering the best solutions to researchers, without duplication.
- Through involvement in the Digital Research Commons (DRC), expand and enhance the diversity, reach, and services offered to meet the evolving needs of our researchers.
- Strengthen relationships and clarify roles within the IT community at McMaster
- Evaluate and right size the cost recovery aspect within the RHPCS funding model.
- Ensure long-term operational excellence and sustainability of RHPCS.

Chief Technology Officer Executive: AVP and CTO with UTS Directors



Gayleen Gray, Andrea Oliver, Tracy Dallaire, Paula Brown-Hackett. Missing: Nicole Longstaff.



Engineering a **Brighter Future**

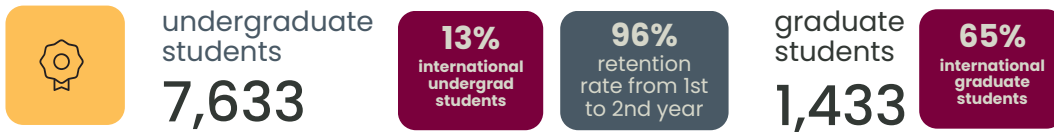
December 20, 2024

2023-2024

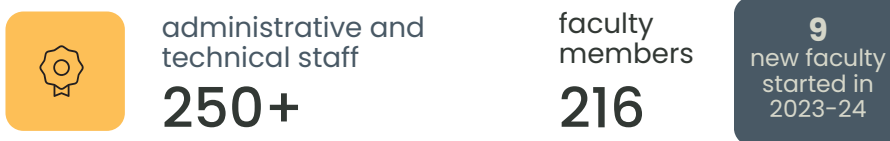
Fast facts

Ranked among the top engineering schools in the country, the Faculty of Engineering plays a key role in helping McMaster University earn its reputation as one of Canada's most innovative and research-intensive universities.

Students



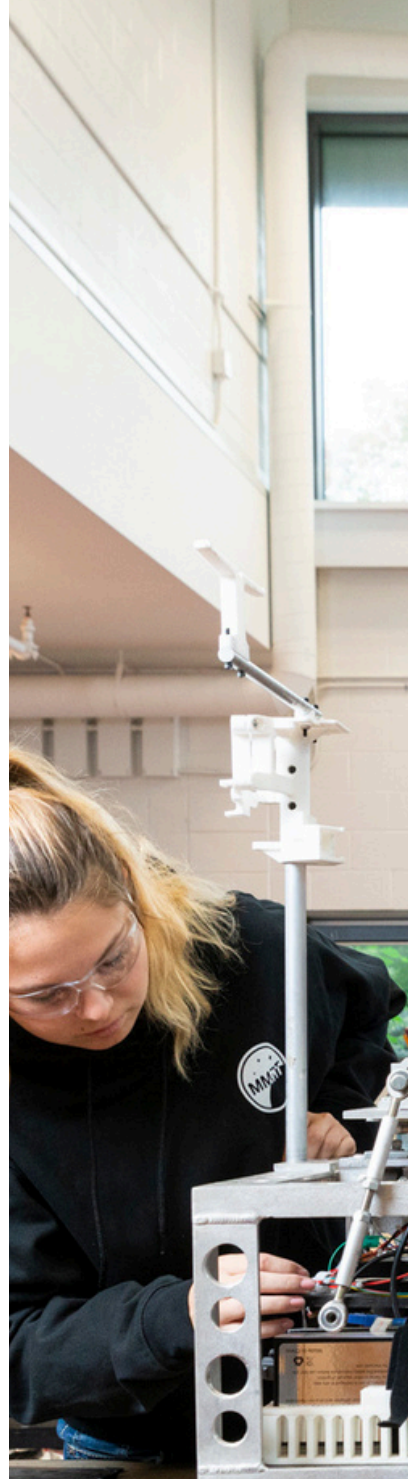
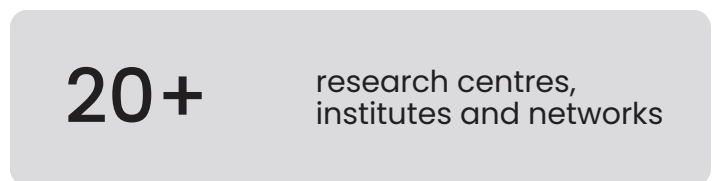
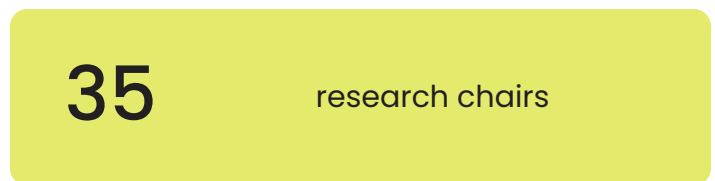
Faculty and staff



Alumni



Research



Mac Eng points of pride:

- McMaster Engineering is home to the second-largest engineering co-op program in Ontario and the third largest in Canada. In 2023-24, more than 4,700 undergraduate and graduate students benefited from a flexible co-op program that allows students to undertake paid work opportunities of varying lengths with support from the Centre for Career Growth and Experience.
- McMaster Engineering has the largest undergraduate research program in Canada. In as early as the summer after first year, students can gain meaningful research experience. In summer 2024, we had more than 250 undergraduate students pursuing research positions on campus through a range of funded programs.
- McMaster Engineering has more than 70 clubs and teams with participation by at least 3,500 students. Students develop transferable and technical skills working with their peers on projects and initiatives, often traveling across Canada and internationally to participate in events.



46% of incoming engineering and iBioMed undergraduate students for Fall 2024 are women – a historic high for the Faculty.



Leadership

Heather Sheardown, Dean

Sarah Dickson-Anderson, Associate Dean, Undergraduate

Carlos Filipe, Associate Dean, Research, Innovation and Partnerships

Kathryn Grandfield, Associate Dean, Graduate Studies



Department Chairs

Mohamed Bakr, Electrical and Computer Engineering

Rafael Kleiman, Engineering Physics

Jake Nease, Chemical Engineering

Richard Paige, Computing and Software

Lydell Wiebe, Civil Engineering

Greg Wohl, Mechanical Engineering

Hatem Zurob, Materials Science and Engineering

Associate Chairs - Undergraduate

Shelir Ebrahimi, Chemical Engineering

Wolfram Kahl, Computing and Software - External

Xun Li, Electrical and Computer Engineering

Matthew Minnick, Engineering Physics

Sebastien Mosser, Computing and Software - Internal

Cheryl Quenneville, Mechanical Engineering

Oleg Rubel, Materials Science and Engineering

Michael Tait, Civil Engineering

Associate Chairs - Graduate

Jacques Carette, Computing and Software

Andrew Gadsden, Mechanical Engineering

Zhen Gao, W Booth School of Engineering Practice and Technology

Adrian Kitai, Engineering Physics

Shiva Kumar, Electrical and Computer Engineering

Leili Tafaghodi, Materials Science and Engineering

Li Xi, Chemical Engineering

Boyang Zhang, Chemical Engineering

Robin Zhao, Civil Engineering

Associate Chairs - Research

Fei Chiang, Computing and Software

Wael El-Dakhakhni, Civil Engineering

Todd Hoare, Chemical Engineering

Natalia Nikolova, Electrical and Computer Engineering Page 27 of 55



W Booth School Undergraduate Program Chairs

Fei Geng, BTech Biotechnology

Michael Justason, BTech Civil Engineering Infrastructure Technology

Hoda Kamel, BTech Business and Management

Moein Mehrtash, BTech Automotive and Vehicle Engineering Technology

Eu-Gen Ng, BTech, Manufacturing Engineering Technology

Chi Tang, BTech Power and Energy Engineering Technology

Seshasai Srinivasan, BTech Software Engineering Technology

Tom Wanyama, BTech Automation Systems Engineering Technology

Graduate Program Directors

Brian Baetz, Director, W Booth School

Ravi Selvaganapathy, Co-Director, School of Biomedical Engineering

Undergraduate Program Directors and ADs

Kostas Apostolou, Associate Director, W Booth School

Brian Baetz, W Booth School

Cameron Churchill, Engineering and Society and Experiential Learning Office

Vincent Leung, Engineering and Management and Associate Director, Integrated Biomedical Engineering and Health Sciences

Colin McDonald, Integrated Biomedical Engineering and Health Sciences (iBioMed)

Kenneth Owen, Interdisciplinary Minor in Innovation

Tom Wanyama, Learning Factory, W Booth School

Administration

Ryan Liddell, Director, Operations and Finance

Maria White, Assistant Dean, Undergraduate Students

Lindsay Bolan, Director, Outreach and Engagement

Joel Côté, Director, Development

Amber Bukata, Manager, Staffing & Administration

Andrea Colbert-DeGeit, Manager, Faculty Relations

Shannon Cummings, Associate Director, Engineering Student Recruitment & Community Outreach

Michael Curwin, Associate Director, Information Technology & Services

Stephanie Harper, Associate Director, Centre for Career Growth and Experience

Keiko Kataoka, Manager, Communications

Gregor Lawson, Director, Research Innovation & Partnerships

Jeff Longley, Manager, Facilities

Meggie MacDougall, Acting Alumni Manager

Karen Tsang, Manager, Finance

Faculty priorities

Our strategic plan - Engineering a Brighter Future - identifies a vision, mission, values and four key priority areas that guide the efforts of our faculty and staff to 2029. Since its launch in the fall of 2023, numerous initiatives have been undertaken or completed. Below is a snapshot of this work, which showcases a range of activities across our departments and units.

Vision:

Leaders in advancing engineering for global change.

Mission:

Empowering agile and globally conscious leaders in engineering who collaborate to create a brighter future.



“

Engineering a Brighter Future boldly charts our path to becoming leaders in advancing global change.

- Heather Sheardown, Dean of Engineering

Priority 1: Unparalleled student experience

Our approach is student-centric,
prioritizing learners in all we do.



Initiatives

TalkSpot

TalkSpot, a dedicated mental health service for Mac Eng students, offers same-day, weekday appointments with a registered counsellor. Appointments provide a space for students to share their thoughts, problem-solve and receive resource suggestions.

Centre for Career Growth and Experience

The Centre for Career Growth and Experience provides co-op, career, and experience-related guidance to support students develop their career confidence. Last year, the Centre delivered more than 250 career-related workshops and facilitated more than 4,700 undergraduate and graduate co-op terms with 1,500 leading employers.

Graduate Studies

Graduate Studies is developing an Engineering Graduate Student Parental Leave Fund to support MASC graduate students on parental leave.

Exchange opportunities

Exchange opportunities across departments facilitated global educational experiences. Chemical Engineering supported a student exchange to Germany for research at Sartorius, while Materials Engineering facilitated exchanges at Université Grenoble Alpes.

Introduction to Civil Engineering

The new CIVENG 2X03 course introduced students to practical civil engineering applications through construction site visits and industry-relevant software experience.

Priority 1: Unparalleled student experience

Our approach is student-centric, prioritizing learners in all we do.

More initiatives

AI tool for AODA compliance

An artificial intelligence tool was developed to support digital AODA compliance for course materials.

Top Hat digital tool for the classroom

Top Hat, a student engagement platform, was introduced to drive in-class discussions, live polls and real-time feedback. Outside of class, it can be used to create or customize interactive content.

Cross-university collaboration:

BTech accelerated pathway to an MBA

Bachelor of Technology graduates in three streams are now able to pursue an accelerated Master of Business Administration with DeGroote School of Business. Students can complete the program in eight months of full-time study. The pathway recognizes BTech's strength in delivering curriculum that effectively blends technology and business outcomes.

Place and space

Significant renovations and upgrades were made to enhance student and research spaces, including:

- Renovations underway for a new 5,000 sq. ft design studio space for IP13, supported by generous donor contributions. This cutting-edge facility strengthens our capacity to expand the undergraduate Engineering cohort, pending additional seat allocations from the provincial government.
- Electrical and Computer Engineering established a new research lab in the Communications Research Laboratory and doubled the capacity of graduate student work spaces.
- The Biointerfaces Institute upgraded 1,500 sq. ft. of lab space and instrumentation to expand diagnostics and biomanufacturing work.
- Civil Engineering is renovating the Advanced Dynamics Laboratory, which is used for research with students, faculty and industry.
- Engineering Physics started an 'open lab' concept for undergrad teaching labs, resulting in more time and flexibility for students to access labs and teaching assistants.

Coming soon: An interdisciplinary minor in Nuclear Studies and Society open to all McMaster undergraduate students

Priority 2: Innovation with impact

Our novel ideas and applications positively impact lives.



Initiatives

Experiential course on batteries

Supported by a \$50,000 grant, equally divided between the Department of Electrical and Computer Engineering and the Faculty, assistant professor Phil Kollmeyer will teach an experiential course on batteries. Electrification is a key strength for McMaster, and this lab will help maintain its position at the forefront of innovation in this area.

Point-of-care diagnostic devices

The development of next-generation point-of-care diagnostic devices for chronic and infectious respiratory diseases, in partnership with Methapharm, is made possible through the Respiratory Diagnostics Alliance Grant.

MALDI Mass Spectrometer replacement

The replacement of the MALDI Mass Spectrometer will provide approximately 40 researchers and external users with access to a unique instrument for protein and materials characterization.

Advanced micro/nano manufacturing equipment

The installation of new equipment funded by the Canadian Foundation for Innovation will enhance advanced micro/nano manufacturing capabilities for cutting-edge research and prototype development. This includes microfluidic devices, wearable biosensors, quantum devices and photonics for high-speed communications.

Priority 2: Innovation with **impact**

Our novel ideas and applications positively impact lives.

More initiatives

Applied Dynamics Lab reinvigoration

The reinvigoration of the Applied Dynamics Lab establishes it as a Core Research Facility, adding advanced infrastructure to support sustainable and resilient infrastructure research.

Server room expansion

The server room expansion, with a significant increase in Graphics Processing Units servers, will support additional faculty and enhance teaching and research in the AI space within the Computing and Software department.

Cross-university collaboration: **Fête de la Science**

On October 10, the Faculties of Engineering and Science, along with the Office of International Affairs, welcomed more than 100 youth and members of their family to a celebration of STEM – the Fête de la Science – hosted in collaboration with the French Consulate of Canada. Attendees participated in hands-on STEM activations, a campus tour and lectures from water researchers.

iBioMed curriculum reshaping

The iBioMed program is reshaping its curriculum to embrace flexibility, technology and entrepreneurship, offering more personalized educational journeys that align with student interests in biomedical engineering. It is also creating pathways to commercialization by advancing ideas beyond the classroom and leveraging partnerships to propel student ideas into viable commercial ventures.

International Undergraduate Research Pilot (iUSRA)

The new iUSRA program successfully launched in the summer, led by the Associate Dean, Research Office. This initiative supported seven upper-year international students in securing research co-op positions with engineering professors, demonstrating our commitment to recruiting top global talent and addressing a long-standing gap in undergraduate research funding previously limited to domestic students.

Diversity-centred STEM outreach

McMaster Engineering's diversity-centered STEM outreach initiatives supported by \$350,000 in external funding have engaged 33,950 youth, with a projected total of 35,000 by year-end, far exceeding the original goal of 32,000. This record-setting engagement level highlights McMaster's commitment to inclusivity, innovation, and global connectivity within engineering education.

Priority 3: Extended global reach

Our inclusive global network is strengthened through collaboration and partnership.



Initiatives

Developing strong alumni connections outside of Canada

The Engineering Alumni team organized trips to key locations such as San Francisco and Boston to reconnect with alumni. These connection points offer an opportunity for administration and staff to share updates with alumni and encourage sustained connections with alumni who may be willing to hire Mac Eng co-op students or donate time or funds.

CERC in Nano-Optical Biosensing and Molecular Diagnostics

The Department of Engineering Physics hired Niko Hildebrandt, McMaster's only faculty member to currently hold a Canada Excellence Research Chair. Hildebrandt brings global expertise, connections and experience in biosensing to his funded role as CERC in Nano-Optical Biosensing and Molecular Diagnostics.

International student scholarships

Our strategic scholarship programs achieved continued success, with 33 top-awarded students from 15 countries accepting their offers and enrolling for Fall 2024. These exceptional recipients, securing competitive renewable scholarships valued between \$30,000 and \$100,000, demonstrate our commitment to recruiting the best and brightest talent from across the world.

Priority 3: Extended global reach

Our inclusive global network is strengthened through collaboration and partnership.

More initiatives

Materials Engineering collaboration with U of T and U of Tokyo

For the fifth year and the largest event to date, the Department of Materials Engineering hosted students and professors from the University of Toronto and the University of Tokyo for three days of presentations, networking and discussion on materials engineering research.

Cross-university collaboration: **New Terrence Hoffman Humanities Professor-in-Residence**

The Terrence Hoffman Professor-in-Residence, generously funded by and named for the founding member and former chair of McMaster's Department of Chemical Engineering, will deliver two humanities lectures to engineering students during the 2024-25 academic year.

Appointed to the role is Manuel Vasquez Villavicencio, assistant professor of philosophy in McMaster's Faculty of Humanities. He began his career as an engineer, making him uniquely qualified to align his humanities lectures to an engineering audience.

Centre for Emerging Device Technologies (CEDT)

CEDT is fostering leadership and communication skills among students through opportunities like active, hands-on research that has helped build a strong community and established new collaborations in Canada and internationally.

Creating opportunities for industry engagement

The Centre for Career Growth and Experience has helped lead initiatives like the Capzone at the annual Capstone Expo, which engaged more than 120 alumni and more than 90 unique employers at a celebration of student innovation.

Opening of biomanufacturing lab with support from Sartorius

Sartorius Stedim Biotech, a global leader in biopharmaceutical innovation, has partnered with the Faculty to advance biomanufacturing research. This collaboration includes a \$2.1M gift-in-kind of advanced biomanufacturing equipment, contributing to a total investment of more than \$8M (\$1.225M Sartorius cash contribution; \$1.94M matching funds from the Natural Sciences and Engineering Research Council (NSERC) of Canada's Alliance Grant program; \$2.9M from the Biosciences Research Infrastructure Fund (BRIF)), and supporting the creation of a high-performance biomanufacturing facility.



Priority 4: Aligned investments

Our strategic investment in people, technology and space enables success.

Initiatives

Boost for the Integrated Cornerstone Design Projects Studio

The Engineering Development team secured more than \$200,000 in gifts – and a soon-to-be announced gift that will bring the total to \$2.2 million – in support of construction for the Integrated Cornerstone Design Projects Studio in the former McMaster Manufacturing Research Institute space in the John Hodgins Engineering Building.

Improving mentorship for graduate students

Graduate Studies is providing training to faculty advisors who work with graduate students to improve their mentorship strategies, leading to an improved experience for faculty and students alike.

Working to improve seed funding success

The Office of the Associate Dean of Research, Innovation and Partnerships, in collaboration with the Office of Vice-President, Research, is working to increase engagement and successes in internal seed funding.



Strategic recruitment for graduate students

Engineering Outreach teams alongside the Office of the Associate Dean, Graduate Studies, are actioning a plan to diversify recruitment strategies to attract quality graduate students. The plan includes a sharpened focus on domestic recruitment, including 1:1 communication to applicants and building connections within relevant undergraduate programs at McMaster.

Cross-university collaboration:

Nuclear Now returns for its second year

The Faculty of Engineering, Faculty of Science and Nuclear Science and Operations organized the second annual Nuclear Now event – an opportunity to connect students interested in a career in nuclear with leading employers.



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