





BROCK UNIVERSITY GUIDING VALUES AND PRINCIPLES



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INTRODUCTION

Brock University Overview:

Since it opened in 1964, Brock University has overcome growing pains and challenges to become a vibrant institution of more than 19,000 students, with rich academic programs and world-class research.

Today, Brock offers 120 undergraduate and graduate degrees through six academic Faculties, is home to 13 Canada Research Chairs, and ranks among Ontario's top 5 universities for 3M Awards for Teaching Excellence.

Brock University is also ranked as one of the best universities in Canada for student satisfaction, as well as a leader in career success and experiential learning. The employment rate for Brock graduates two years after graduation is higher than the average for Ontario universities.

The Faculty of Mathematics and Science Overview:

Since Brock's earliest days, the Faculty of Mathematics and Science (FMS) has been a leader in building the academic reputation of the university. FMS's tradition of hiring exceptional faculty members and mounting innovative undergraduate and graduate programs has greatly promoted Brock's national and international impact. Faculty members are disproportionately well represented on all key measures of research impact such as holding critical positions on editorial boards of journals as well as tri-council and international grant selection committees. Currently, with fewer than 75 of Brock's 600 faculty members, FMS receives more than half of the external grant funding awarded to the university.

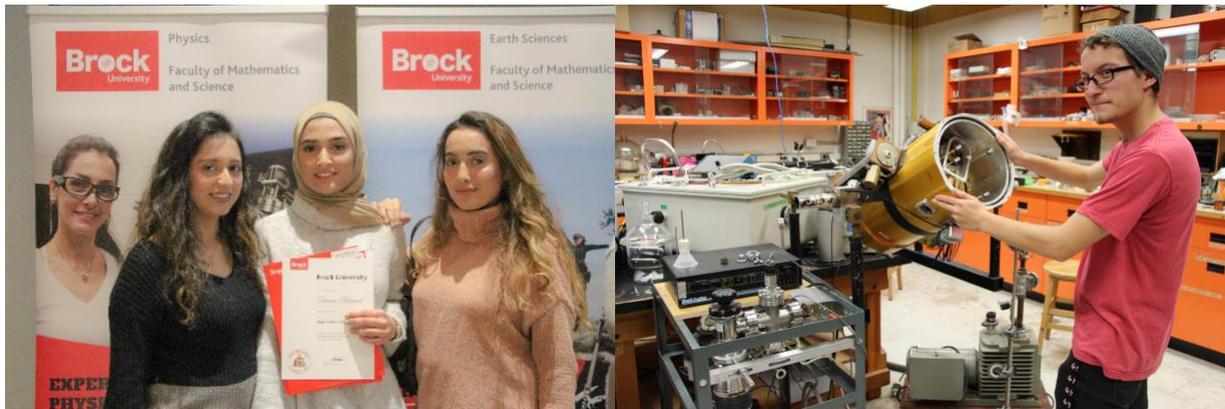
Science is everywhere and Brock must keep strong fundamental research and teaching programs in science and mathematics to remain competitive in our ever increasingly technical world. In addition, Brock must take advantage of new areas of study arising from societal demand as they arise. Our strategic plan is to strengthen our base of fundamental research and academic excellence, support existing trans- and interdisciplinary research and teaching programs, and launch new innovative programs to take advantage of today's opportunities.

Merging Brock's vision with the Faculties' vision.

As part of our Strategic Plan we include links to interdisciplinary and transdisciplinary initiatives, institutes and centres. As we look to the future, the Faculty of Mathematics and Science Strategic Plan is intended to maintain the strength in all traditional disciplines to allow us to grow and enhance programs and research in the following overlapping areas: *Sustainability, Software, Mathematics and Statistics, Computation, Engineering and Technology, and Health*. These interwoven aspects of imperative importance to Math and Science act as our *Forefronted Four* and define the aspirations and future direct of the Faculty.

The Importance of the Forefronted Four

A faculty-wide survey was performed within each department to articulate their goals and needs over the next 3 to 5 years. The culmination of their requests for research, programs, courses, staff and faculty was distilled down into an ordered list of topics and infrastructure needed to achieve the Faculty's goals. The plan includes details concerning where the faculty is headed in terms of research, undergraduate and graduate programs.



THE FOREFRONTED FOUR

The Forefronted Four encompass developing programs and areas of research strength in the Faculty of Mathematics and Science. These four areas are overlapping and intertwined. The areas are highly dependent upon maintaining a strong foundation in the core disciplines of the sciences.

Sustainability

- Green Chemistry
- Bio-manufacturing – Applied Bio-manufacturing Centre
- Environmental Geoscience
- Energy and Materials
- Applied Ecology
- Environmental Sustainability Research Centre

Data Science, Software, Mathematics and Statistics, Computation

- Centre of Intelligent Systems e.g. artificial intelligence, data science, software systems
- Computational Mathematics, Physics, Biology, Chemistry
- Software and Computation Analytics
- Centre in Data Science and Analytics

Engineering and Technology

- Bioengineering
- Water Science
- Physics/Materials Science
- Brock-Niagara Testing, Prototyping and Manufacturing Institute
- Sustainable energy systems

Health

- Pharmaceutical Chemistry
- Bioengineering
- Centre for Neuroscience
- Centre for vector-borne diseases
- Biotechnology/Biomedical Sciences
- Computational Medical Physics

Vision, Mission and Principles

Vision

The Faculty of Math and Science will be a destination of choice for the world's brightest minds seeking the best learning experience at a University that is a leader in student satisfaction. FMS will work with faculty and staff members internally and with various University departments and act as a driving force in further enhancing the reputation of Math and Science and Brock University.

Mission

Our dedicated faculty and staff aim to inspire and develop a new generation of enlightened scientists, mathematicians and scientific leaders by providing students with an education that is both challenging and innovative.

Principles

Through research, discovery and community engagement, our students enhance their own scientific awareness, become responsible citizens and learn to apply their knowledge to solve problems toward a better world. We are proud of the many accomplishments of our undergraduate and graduate students as well as the success of our alumni. From prestigious scholarships and awards to careers in top companies, ground-breaking research, publications and community involvement, our students continue to impress and inspire us. Along with our ever-growing reputation for discovery, innovation and research excellence, we aspire to increase awareness of scientific issues for students and the community at large.

STRATEGIC ALIGNMENT

Strategic Priority 1 - Offer a transformational and accessible academic and university experience.

FMS has a long tradition of facilitating student's access to programs, faculty and hands on research. State of the art undergraduate laboratory experiences, exceptional BSc honours research thesis options coupled with strong graduate programs expose our students to cutting edge research and give them the tools they need to succeed. We plan to develop new and innovative programs which will continue to deliver our high degree of hands on experience as well as explore novel methods of program delivery.

University Goal: Deliver high-quality programs that meet the interests and needs of students, and support them to achieve their potential in life.

FMS Goals and Actions

- Develop and enhance curricula for graduate and undergraduate programs.
 - Develop Integrated Engineering and Technology programs such the new minor in Engineering Science
 - Develop and support new and existing programs aligned with transdisciplinary research institutes. Expand data sciences and analytics transdisciplinary streams
 - Develop integrated programs with other Brock Faculties and within FMS.
 - Offer joint graduate programs and courses with international or national universities
 - Be nimble in mounting programs in areas of emerging strategic importance
- Maintain and enhance our commitment to providing experiential education opportunities
- Ensure the quality and availability of academic advising services for students.
- Improve the transitioning of incoming students and the retention of current FMS students.

University Goal: Expand Brock's lifelong learning opportunities for our students and members of the community.

FMS Goals and Actions

- Commitment to offering alternatives to traditional program and course delivery
- Develop courses for adult education

University Goal: Provide an engaging campus experience that meets students' needs and affords social, cultural and recreational opportunities for all students.

FMS Goals and Actions

- Establish a red-flag pilot project system for the identification of FMS majors at risk
- Expand opportunities for more faculty/student interactions by organizing FMS social gatherings and Town Hall meetings, e.g. Establish a FMS 'science café' (internal) to foster interactions & general discussion.
- Encourage and support existing student clubs and the Math & Science Council, which offers social, mentoring and recreational activities. Create a FMS Graduate Student Council.
- Create scholarships and/or an improved funding model for graduate students (and especially international graduate students)
- Encourage graduate involvement in the GSA, acquire and refurbish a FMS Graduate Student Commons

University goal: Offer globally-oriented learning and experience opportunities.

FMS Goals and Actions

- Promote internationalization of programs and curriculum development and delivery
- Expand our 2+2 and exchange programs with international universities
- Enhance the international exchange and research collaboration program
- Expand opportunities for visiting international scholars
- Establish matching FMS funding to augment the existing support that students, who participate in international conferences, get from the Faculty of Graduate Studies.

Strategic Priority 2 -Build research capacity across the university

FMS has the strongest research capacity per faculty member at Brock. There is much room for growth and increasing the number of faculty members within FMS, including Canada Research Chairs and Endowed Research Chairs is a guaranteed path to increasing Brock's research capacity and impact. Smart hiring in areas of current strength and in areas of emerging importance is planned and will support our strong fundamental research and our targeted areas of sustainability, software and computation, engineering and technology, and health. We will also continue to build research infrastructure at Brock by pursuing large grant opportunities with Research Services.

University Goal: Nurture a culture of research and creative excellence.

FMS Goals and Actions

- Foster and enhance excellence in research and innovation, scholarship and creativity
- Enhance recognition of, and public awareness of, the research accomplishments of faculty, research associates and graduate students
- Allocate space for FMS research students to meet, network, and study together
- Establish a FMS 'science café' to foster interdisciplinary research opportunities
- Assist faculty in investigating alternative funding opportunities
- Ensure adequate start-up funds for new faculty
- Continue work with Research Services to pursue large grant opportunities

University Goal: Invest in research infrastructure and support to ensure sustainable and accessible research services for the Brock scholarly community.

FMS Goals and Actions

- Ensure sufficient and appropriate (affordable) space for researchers
- Bring funding from new sources to the university

- Increase mechanisms to maintain state-of-the-art research infrastructure
- Continue work with Research Services to pursue large grant opportunities

University Goal: Enhance transdisciplinary research and high-impact research practices.

FMS Goals and Actions

- Increase faculty numbers in strategic research areas
- Encourage transdisciplinary initiatives such as seminars and research proposals within FMS and with other Faculties.
- Work with Advancement to establish Endowed Research Chairs and infrastructure
- Continue work with Research Services to pursue large grant opportunities

University goal: Build Awareness of Brock University as a centre of research excellence.

FMS Goals and Actions

- Communicate the successes of our faculty, staff, researchers, alumni and students to national and global media
- Increase faculty involvement in international academic and professional activities, e.g. teaching, seminars, editorships, roles in international societies, funding panels, etc.
- Work with Advancement to establish Endowed Research Chairs and infrastructure
- Use traditional and social media to grow awareness of faculty research

Strategic Priority 3 - Enhance the life and vitality of our local region and beyond.

Brock University arose in response to regional needs and FMS has been a leader in regional research activities and programs of regional interest from the outset. The coupling of our OEVI program with our development of CCOVI is an excellent example. Research on ecological health, water quality, mosquitos and West Nile disease, and our recent success with the Brock-Niagara Testing Prototyping and Manufacturing institute are all examples with a large impact on our local region. We plan to continue to serve with programs and research targeted towards our local region as well as increasing support to community outreach activities.

University Goal: Increase and enhance enriching opportunities for our students, alumni, faculty and staff to engage with the community.

FMS Goals and Actions

- Increase the accessibility and awareness of FMS to the community
 - Scientist for a day program to enhance community outreach e.g. CSI, genealogy, water sampling, ecology (on campus)
 - Deliver workshops in areas of community interest or concern at community centres for off-campus outreach
 - FMS open houses welcoming the community on campus and within the region
 - Create certificate programs that match community needs irrespective of educational background

University Goal: Support regional economic, social and cultural vitality.

FMS Goals and Actions

- Work to develop new and innovative research collaborations with a focus on the community
- Provide our expertise to support community initiatives
- Promote the current research programs and initiatives that support the local community e.g. Brock-Niagara Testing, Prototyping and Manufacturing Institute, CCOVI, OEVI, Centre for vector borne diseases
- FMS to hold networking meetings for/with DSBN/NDCSB Science Teacher (discussions & tours).
- Enhance our interactions with local schools through our existing programs/initiatives as well as create opportunities for Faculty and/or graduate students to visit/talk/answer questions.
- Encourage and assist faculty to submit for grants that support the community

University Goal: Enhance engagement with Indigenous communities in the spirit of reconciliation.

FMS Goals and Actions

- Work with the Vice-Provost, Indigenous Engagement, towards the indigenization of our curriculum.
- Actively search for indigenous faculty and staff
- Provide greater support for indigenous students

- Greater education for faculty and staff on issues of importance to indigenous students and the indigenous community
- Increase faculty and student awareness of indigenous science

University Goal: Cultivate outstanding relationships with our alumni starting with their earliest interactions with the University.

FMS Goals and Actions

- Foster the development of a Brock FMS identity through their undergraduate years and beyond
- Create new communication touchpoints in channels our current and future alumni use
- Encourage and support alumni involvement in undergraduate and graduate student clubs, councils and networking events
- Include alumni in the organization and participation of community outreach initiatives

Strategic Priority 4 - Foster a culture of safety, inclusivity, accessibility, reconciliation and decolonization

The Faculty will work with the Universities' strategic partners both in-house and in the community to ensure we are continually developing programs of support. We will meet and surpass all benchmarks for a culture of safety, inclusivity, accessibility, reconciliation and decolonization.

University Goal: Promote effective human resource practices and philosophies that improve safety, inclusivity, accessibility, reconciliation, and decolonization.

FMS Goals and Actions

- Increase awareness of barriers to ensure the accessibility of our programs to everyone
- Coordinate with HR to ensure that our hiring practices improve inclusivity, accessibility, reconciliation, and decolonization
- Implement the Brock University policy for respectful work and learning environment and promote the principles of dignity, respect, inclusion, equity and diversity for all people.
- Create a safe place to learn and work including safe practices, setting and enforcing protocols and regular updates to safety and maintenance plans.
- Increase and promote practices to avoid biases in allocation of resources

FMS, and all departments/units within it, will actively seek qualified candidates from disadvantaged/under-represented communities (Indigenous people, women, racial/ethnic minorities, people with accessibility problems, LGBTQ2S+) in (for) all future academic as well as non-academic hiring.

University Goal: Strengthen relationships of trust with indigenous communities and partners across all sectors and activities of the University.

FMS Goals and Actions

- FMS will work with the Aboriginal Student Services to meet with indigenous students to discuss their concerns and the ways to alleviate them
- FMS will work with the Aboriginal Student Services and Six Nations Schools in the region to increase participation in the annual event 'BOWS' (Bridging Our Worlds through Science). Increase representation on the Two Row (One Dish with One Spoon) Council
- Greater education for faculty and staff on issues of importance to indigenous students and the indigenous community
- Work with the Vice-Provost, Indigenous Engagement, towards the indigenization of our curriculum.
- Actively search for indigenous faculty and staff
- FMS will strive to incorporate indigenous perspectives and wisdom in its curriculum, wherever possible and appropriate (e.g., courses such as Science and Society).
- FMS will seek advice/expertise from the Office of Indigenous Engagement and the Two Row (One Dish with One Spoon) Council, to develop proper 'Code of Conduct' for all FMS students when interacting with the Indigenous community

University Goal: Further celebrate the success of our faculty, staff, students and alumni.

FMS Goals and Actions

- Communicate the successes of our faculty, staff, researchers, alumni and students to national and global media

ACTION ITEMS

FMS will pursue these action items and others on an ongoing basis.

- Work to improve transition year success of students pursuing post-secondary studies by growing course offerings such as FMSC 1P00, NEUR 1P01, and preparatory courses for high school and international students
- Support the work of the Recruitment Office by recognizing faculty & staff participation in recruitment activities (e.g. Ontario University's Fair, Fall Preview and Spring Open House).
- Establish a feedback mechanism for FMS students and use it to improve services.
- Develop new specialized graduate degree and diploma programs such as course-based Masters' programs.
- Secure stability for Faculty Academic Advising position and plan for further service growth.
- Assist the Student Development Centre (SDC) in servicing drop-in help for FMS courses. Give the SDC access to course material and assist with training their Help Centre personnel.
- Review existing exchange agreements and articulation programs within FMS and assess their scope and prospects. Then encourage Departments/Programs to bring forward proposals for new revenue generating initiatives.
- Focus on students that are at academic risk in hopes of maintaining/increasing our retention rates.
- Develop programs created to accept students whose backgrounds are not strong enough for a major science program and for those that require assistance with the development of lab skills
- Strengthen the marketing of existing FMS programs, and enhance the marketing of our existing international activities
- Develop a course or workshop titled: Professional Conduct with First Nations People with the office of learning services and indigenous engagement
- Create a new PhD program called Intelligent Systems and Data Science. It will be a joint program between the department of Mathematics and Statistics and the department of Computer Science
- Create a new Mathematics and Statistics undergraduate BSc program in Data Science and Analytics in collaboration with Computer Science and the Goodman School of Business and expand its streams in other application domains.
- Continue to create excellence in research and support organizing international conferences both at Brock and at other centers such as the Fields Institute.