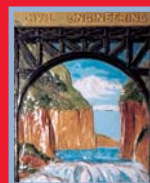


**McGill**

FACULTY OF ENGINEERING

Dean's Report



Dear Graduates and Friends,

Earlier this year, I was delighted to accept the position of Dean of the Faculty of Engineering at McGill. Given McGill's thriving, interdisciplinary research environment and international reputation for academic excellence, I could not resist the opportunity to join this diverse community made up of faculty and students of the highest calibre from across North America and around the world.

I look forward to bringing you Engineering news throughout the year: advancements in leading-edge research and teaching, outstanding student achievements and ways for you to get involved with your Alma Mater. Alumni can play tremendous and varied roles as ambassadors who build McGill's global community.

The Faculty itself continues a remarkable period of evolution in which dynamic young professors and researchers are joining our team, and innovative partnerships with other research institutions, govern-

ment and industry are flourishing from the local level up to the international community. Engineering disciplines are extending into other areas of study at an unprecedented pace – in medicine, science, management and the social sciences. This momentum is creating more opportunities for McGill to reinforce and expand its leadership position in research and discovery. It is important that the Faculty be a competitive force in this broadening academic landscape and meet the increasing expectations of industry and society.

In order for all of this to happen, we have to attract the best graduate students from across the globe. The continuing success of our research enterprise depends on them, and building this enterprise for the future means graduate student support must be a top priority. Financial incentives that not only compete with other institutions but surpass them will ensure these students choose McGill.

This in turn can help the Faculty recruit the best professors, especially in a period of robust academic renewal such as McGill is experiencing today. Engineering is hiring 17 new professors this year alone, and our goal is to increase the faculty complement to 150 members in the next three years.

We will be encouraging you to take part in this successful future. The Faculty has a proud tradition of philanthropy: plaques throughout our buildings pay tribute to generations of loyal graduates and benefactors who have contributed to engineering projects and campaigns. Our alumni and friends have also been instrumental in supporting many of the Faculty's initiatives for students through the Engineering Development Fund. That support is yet another reason we can all take pride in Engineering at McGill.

Christophe Pierre
Dean

ENGINEERING**ALUMNI PRIDE**



Christophe Pierre with Development Office staff Robyn Ouimet and Terry Tobin

Gifts to the Engineering Development Fund empower students, taking their education beyond the classroom and laboratory. The generosity of alumni and friends provides the Faculty with the flexibility to support new projects as they arise, enriching the learning experience for everyone.

Given the opportunity, our engineering students are quick to take on a wide variety of challenges, from experimental design projects to helping people in developing countries with technology and education. Student leaders often take the initiative to secure substantial private sponsorship for their projects, but the additional support they receive from the Development Fund ensures these projects can continue.

Recent student initiatives like the McGill Electric Snowmobile Team have benefited from Development Fund support. So has the cornerstone of student activity in the Faculty, the Engineering Undergraduate Society, which receives funding each year for programs like "How to Succeed in Engineering" during Frosh Week. Donations are increasingly important in providing extra funds for graduate students receiving NSERC and other research grants, helping McGill recruit the best and brightest and build on the success of its research enterprise.

We've sent women engineering students to conferences as part of the POWE program – Promoting Opportunities for Women in Engineering. And in bringing industry leaders to speak on campus, the Development Fund can help students gain valuable insights into the engineering field as it is practised today.

The Engineering Development Fund

Engineering Community Spirit

- ♦ Engineering Undergraduate Society
- ♦ Student Orientation Activities
- ♦ Department and School Student Societies

Graduate Student Support

- ♦ Top-up funds for NSERC and other grants
- ♦ Recruiting the best and brightest

Student Conferences and Competitions

- ♦ Quebec Engineering Competition
- ♦ POWE – Promotion of Opportunities for Women in Engineering
- ♦ iSun Solar Car Team
- ♦ Electric Snowmobile Team
- ♦ Concrete Toboggan Team
- ♦ Wooden Catapult Team

Humanitarian and International Projects

- ♦ Engineers Without Borders
- ♦ AIESEC Global Internships



McGill Hosts Quebec Engineering Competition

Students in the Faculty are looking forward to hosting the Quebec Engineering Competition from January 19-22, 2006. Over 250 delegates from schools across Quebec will gather to show off their engineering know-how by competing in six categories: Team Design, Senior Team Design, Innovative Design, Consulting Engineering, Debate, and Engineering Communication. The competition features collaborative projects completed on-site and puts engineering knowledge and teamwork to the test. Students will solve prob-

lems in prototype design, make presentations about their projects, and tackle subjects like sustainable development and communicating complex technical processes to the general public.

Student organizers Egbert DeGroot, BEng'06, and Andrea Linsky, BEng'07, (pictured left) invite alumni and friends to come see the results for themselves on Saturday, January 21, when the student designs will be on display at the Montreal Science Centre in Old Montreal. They would also love to hear from potential sponsors and volunteers. For information, contact engineering.alumni@mcgill.ca or (514) 398-1371.

Good Vehicles for Innovation

Student design teams are another way the Development Fund is put to work, giving students real-world engineering opportunities at national and international competitions.

McGill's Team iSun has built one of the lightest solar cars in the world. Their work promotes innovative applications of alternative energy and has earned them coverage in media around the globe.

The McGill Racing Team builds small-scale Formula race cars, recently placing first among Canadian universities at the international Formula SAE competition, and in the top 15 overall.

And for transportation of a really different kind, there's McGill's Concrete Toboggan Team. Building a steel-framed toboggan with a concrete running surface means students apply civil engineering skills in planning, construction management, and steel and concrete design, taking the end product for a showdown with other universities at the Great Northern Concrete Toboggan Race.

Global Experience

Engineering students can add an international dimension to their education through programs like Engineers Without Borders (EWB) and AIESEC. EWB has sent students to help bridge the technology gap in developing countries, and this year the McGill chapter is building a leg-powered pump for irrigating crops in developing communities. As part of AIESEC, an international student organization offering exchange programs, McGill students can gain valuable experience through internships around the world.

CONNECTIVITY IS KEY

Providing the right tools to our students these days means ensuring they have access to the latest computing technology and software that is now central to engineering education, research and professional practice. But computers can be a big expense for those on tight student budgets.

So to help students connect with the technology they need, the Faculty has launched a pilot laptop program, allowing any student to purchase a custom-configured, high-end laptop through the McGill Computer Store at a special discount price. They'll get the tech help they require via on-campus service centres that are being established to provide hardware and software support throughout the year to students who purchase the recommended computers. And they can order their laptop directly through the McGill website. The model selected for the pilot laptop program this year is a highly rated Toshiba with built-in wireless capabilities.

The Faculty has also expanded its wireless network throughout the seven buildings that make up the Engineering complex and plans to install new high-speed wired connections and power outlets in other locations students use like the labs and common areas.

The pilot laptop program extends the services of Engineering's ten computer labs that offer students 24-hour access to over 100 software applications like specialized CAD packages, peripherals like large-scale scanners and printers, and the advanced learning materials they need.

Undergraduates make use of the resources in the John W. Pitts Computer Laboratory



Giving to Engineering



Your gift can support Engineering students directly. When you receive your pledge card through our Alma Mater Fund appeal, just check the box marked

Faculty or School and write "Engineering" or the name of your Department or School in the space provided.

Make Your Donation Online!

Now it's even easier to donate to McGill. You can make your gift online at www.alumni.mcgill.ca/online-giving/. Don't forget to select the Faculty of Engineering or specify your Department or School as your preferred area of support.

Matching Gifts

If you're an employee of a company with a matching gift program, your gift can do twice as much for McGill students. Simply ask your corporate donations officer or HR department for a matching gift application form. Retirees, spouses and board members can also take advantage of these opportunities to double the impact of their gifts. These programs bring thousands of dollars in corporate matches to McGill and allow you to give more – for free. Find out more about matching gift programs at www.mcgill.ca/alumni-support/match/. Contact Robyn Ouimet at robyn.ouimet@mcgill.ca or (514) 398-7138.



An Advanced Learning Environment

Adapting to changes in technology is one of the many challenges for the Faculty. A stimulating, technologically advanced environment in our classrooms and research labs is a top priority. Teaching and research will drive any technology we adopt, but preparing students for industry or graduate studies means ensuring that they keep pace with technology as well – inside and outside of the classroom.

Pedagogical resources today are just as likely to be digital as paper-based. For example, students are increasingly consulting journals online and using web-based course resources. Such interactivity can help them become more engaged in their learning.

Acquiring technologies that match professors' and students' needs effectively means the integration of technology will truly enhance learning. Some offer tantalizing possibilities: for instance, tablet computers have been tested in the field by students to record data into spreadsheets, saving time and helping to ensure accuracy.

Providing the right environment for students also means creating more spaces that encourage teamwork. The Lorne M. Trottier Building offers advanced teaching laboratories, interactive learning centres and multipurpose workrooms that promote creative interaction: intelligent minds coming together to solve complex problems. The Faculty is creating more of these spaces, because we know this kind of learning environment fosters the teamwork skills today's employers demand of our students.



The GM Canada Research Chair is promoting new discoveries in the application of magnesium alloys in the automotive industry

A Meeting of Minds

As little as ten years ago, says Frank Ferrie, Associate Dean of Research and Graduate Studies, most university research was a solitary business. "The typical model was a lone academic working with a small group of graduate students." Flash forward to the Faculty of Engineering today and the research arena presents a radically different picture. Collaboration across departments and disciplines is the rule rather than the exception.

"The world of research has become global and interdisciplinary, and the universities that meet the challenges posed by these changes will become the leaders," says Dean Christophe Pierre.

Emerging areas in the research milieu at McGill like biomedical engineering, nanotechnology and new materials are "where the future is," says Ferrie. Other fields are dealing in new ways with increasingly important public concerns, like environmental design and infrastructure planning. And they are all interdisciplinary, spanning everything from theoretical science to real-world applications.

Ferrie points to Rosaire Mongrain's work in biomedical engineering, which explores the design of cardiovascular devices like coronary stents and blood flow modelling in circulatory diseases. His CardioVascular Engineering Laboratory partners McGill Engineering with the Montreal Heart Institute. Melica Popovic's research in computational electromagnetics has applications in breast tumour detection systems. Srikar Vengallatore is the Canada Research Chair in Advanced Materials for Micro- and Nanosystems whose research will enable the creation of innovative microdevices for products like fuel cells or implantable biosensors, and he joins colleagues from a variety of disciplines at the McGill Institute for Advanced Materials (MIAM).

Research in new materials is leading to important developments in communications and IT, energy generation, transportation and health care. It is a priority area for McGill, and MIAM research brings experts from across the Faculty's departments together with leading researchers in the faculties of Science, Medicine, and Dentistry to discover, understand, design and fabricate new materials.

Joining Forces

Hand in hand with the interdisciplinary research climate at McGill come collaborative partnerships and inter-institutional initiatives. Joining forces with other universities, government and industry is critical in today's research environment. Technical development is expensive: collaboration distributes costs, keeps the Faculty competitive and, as it turns out, attracts more partners.

"The research centres here are world-class and competing on the very edge," says Frank Ferrie. "Companies are seeking us out because they're starting to understand – 'Oh, we need to compete with the rest of these guys who have access to the best people on the planet.' That's a positive position to be in."

Dean Christophe Pierre himself brings a lot of experience with international and inter-institutional collaborations to McGill and will be encouraging more partnerships. McGill certainly has a history in collaborative research networks. The Pulp and Paper Research Institute of Canada, for instance, was established here in 1926. And participation in a variety of networks has grown through the federal government's Networks of Centres of Excellence, such as GEOIDE (Geomatics for Informed Decisions).

McGill's recently launched SYTACom (Centre for Advanced Systems and Technologies in Communications) includes more than 30 experts from across Quebec whose research will have applications in network security, e-commerce, traffic control, telemedicine and more. The Centre's director, Engineering professor David Plant, also heads up the McGill-based Agile All-Photonics Network, where breaking through the bottlenecks in optical networks by creating all-photonic alternatives will revolutionize broadband communications and the Internet.

Engineering faculty members are also part the Centre for Biorecognition and Biosensors, which conducts bioengineering research in nanostructured systems used to develop diagnostic tools for medical, agricultural and environmental applications.

There will be many more such collaborations, Ferrie predicts. Gone are the days of the solitary researcher. "The really big breakthroughs now are likely to come through research teams. The scale of collaboration is matching the progress of engineering."

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Office of Development & Alumni Relations ■ Frank Dawson Adams Building ■ McGill University ■ 3450 University Street, Room 20 ■ Montreal, Quebec, Canada H3A 2A7 ■ Tel: 514.398.1371 ■ Fax: 514.398.7696 ■ www.mcgill.ca/engineering/

Writer: Andrew Mullins ■ **Photographs:** Owen Egan, Nicolas Morin ■ **Design:** Lisa Kisiel, McGill Instructional Multimedia Services

Please direct comments and enquiries to engineering.alumni@mcgill.ca.