Engineering the future

Midway through an ambitious expansion plan—and while facing uncertain economic times—Memorial's engineering school has launched creative new initiatives for placing co-op students in work terms in industry, the community, and internationally

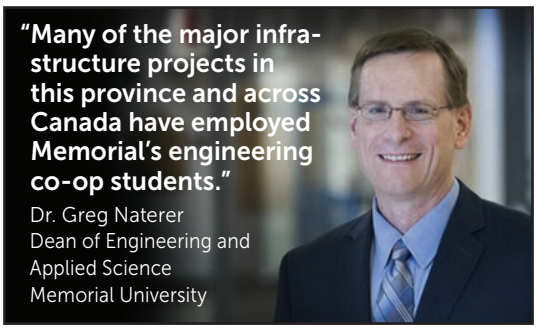
Memorial University's engineering school boasts one of the longest-running and most-respected co-op programs in Canada. Since 1969, the school has placed tens of thousands of students in work terms in a vast range of industries across the globe. In 2016 alone, over 1,100 placements were filled. Doing so requires the effort, creativity, and determination of staff, students, faculty, and employers.

"Many of the major infrastructure projects in this province and across Canada have employed Memorial's engineering co-op students," says Dr. Greg Naterer, Dean of Engineering and Applied Science. He points to the Hebron oil field and Muskrat Falls hydroelectric mega-projects as just two recent high-profile projects that have employed many co-op students. "The students bring fresh new perspectives, enthusiasm and energy, along with diverse technical skills, to contribute in significant ways in the workplace."

The engineering co-op program at Memorial has "a long, proud history and reputation of excellence," says Naterer. All engineering undergraduate students must complete at least four, and up to six, work terms alternating with academic semesters. It's one of the reasons why Memorial's engineering graduates are so sought-after by employers—and why admissions are so competitive, with high school entrance marks averaging about 90 per cent.

That demand and the broader need for more engineers across Canada are driving an ambitious eight-year engineering expansion plan, of which 2017 is the midpoint. Between 2012 and 2021, the number of undergraduate engineering graduates is increasing from 160 to 250 per year. Graduate student numbers will nearly double, from 360 to over 700. Forty new faculty members are being hired. A massive new infrastructure project on Memorial's St. John's campus — the Core Science Facility (425,000 sq ft) — is under construction and will house world-class science and engineering facilities. The facility will dramatically improve the functionality of Memorial's campus and foster multi-disciplinary collaboration between science and engineering.

The engineering expansion comes with a price tag, of course, and the provincial government is investing $1.1 million per year throughout the expansion. "We're grateful to Memorial and the province in recognizing this as a key investment for the economic growth and diversification of the province," says Naterer.



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Memorial University

Third-year mechanical engineering student Kimberly Jarvis during her work term at Nalcor Energy.

TIME FOR CREATIVITY

As more students walk the halls of the engineering building, the demand for work placements also increases—just as the economy of Newfoundland and Labrador has cooled off.

"There are a few more challenges now," says Sherrie Myers, one of 13 academic staff members for the co-op program. "The economy isn't where it was a few years ago, especially in Newfoundland and Alberta... We've reached out to additional employers and industry sectors across Canada, in the U.S., and overseas."

Like all of her co-op education colleagues, Myers has an engineering degree (she completed Memorial's mechanical engineering co-op program) which helps her work with both students and employers in finding the right fit. "We're looking further, and students are becoming more creative and entrepreneurial in seeking out new opportunities."

As well, new co-op opportunities and work experiences have been developed, which, far from being fall-back options, have opened new pathways for aspiring engineers to explore.

The Memorial Centre for Entrepreneurship, a partnership between the Faculty of Engineering and Applied Science and the Faculty of Business Administration, is a new resource for students with an entrepreneurial streak. Among other functions, the centre supports co-op students in launching their own businesses; provides start-up funding to develop business ideas, concepts or prototypes; and supports entrepreneurial work terms.

A new international fund is facilitating work terms abroad. This initiative is especially close to Myers' heart—she completed her fourth engineering work term with a subsea engineering consulting firm in London, England, and credits it for her career success, in more ways than she expected.

"The experience taught me new technical skills, and opened my eyes to life in a fast-paced city in another country," she says. "It also gave me the opportunity to work and socialize with people from different parts of the world … and, ultimately, the courage to later move to Vancouver, secure a position with another consulting company, and easily integrate into a fantastic and international team of engineers."

Engineering students may apply for a research assistantship work term with a professor or a collaborative research project with an industry partner—ideal for students considering graduate studies or an academic career.

Memorial's engineering co-op program has also partnered with local not-for-profit community groups. "Giving back and contributing to the community are important values to be developed by students entering the engineering profession," says Naterer.

"Service learning semesters have huge benefits for the local community and our students," says Darlene Spracklin-Reid, a senior instructional designer at Memorial. "Our students have served not-for-profit community groups who benefit from their excellent technical skills.

56%

Proposed increase in Memorial University undergraduate engineers between 2012 and 2021 (from 160 to 250 graduates a year), thanks to an eight-year expansion program. Graduate-program engineering student numbers are expected to jump to 700 a year—almost double the 360 who registered in 2012. This ambitious growth agenda is being fuelled by the hiring of 40 new faculty members and the construction of a 425,000 sq. ft. Core Science Facility (now under construction).

"For example, students working at the St. John's Northwest Rotary Club designed a reliable power source for a school. Another student at a high school in Mount Pearl supported staff, students and teachers in a project that raises awareness of careers in science, technology, engineering and math [STEM]."

Myers and her colleagues help students find rewarding co-op work opportunities by partnering with employers and coaching students on resume and interview preparation, time management, communication, and other professional skills.

"We are here to help students, but it is also the student's responsibility to pursue opportunities," says Myers. "We find and post hundreds of jobs each term, but we also encourage students to search out and investigate other companies and industries that they're interested in. We see more and more students possess this level of determination and entrepreneurial initiative."

The student job search process itself has changed and improved drastically in the past few years. The previous employer-student "match day" is now a "continuous match" process. Job postings are listed as they arise, and applications, interviews, and placements happen throughout the term. JobFinder@MUN, a continually updated database of national and international engineering co-op opportunities, is an additional new resource.

BENEFITS FOR ALL

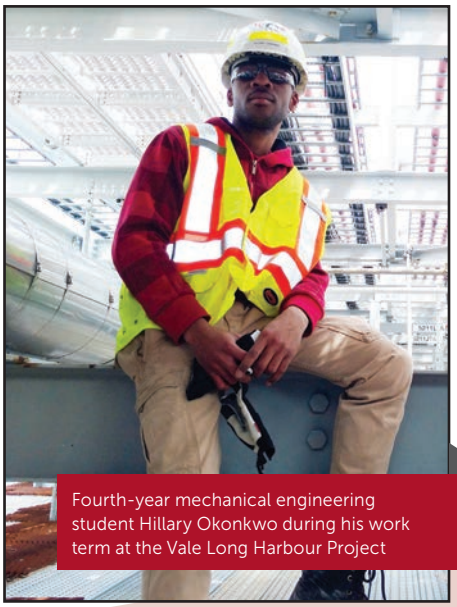
Mechanical engineering student Adam Keating sums up the advantages of a Memorial co-operative education as "the edge needed to be successful": practical work experience, skills development, networking, and the financial benefit of paid work.

"The simple fact that you can graduate from Memorial's program with strong technical competence along with two years of applicable work experience is invaluable," Keating says. Keating won an Honourable Mention, among 80,000 students, at a national Canadian Association for Co-operative Education award.

Myers agrees. "The exciting part of the program as a student is that you can explore different work experiences and environments. Students learn a lot about what's possible in their future careers and they're able to create a path forward."

The benefits for employers are just as multi-faceted, and valuable.

"Students are studying the latest and emerging new technologies—sometimes they can walk in and help companies with projects that staff simply don't have time to address," Myers says. "Or maybe a junior engineer is away for a few months, and a senior student can fill the gap." Supervising a co-op student can be valuable professional development for a staff member looking to build management experience.



Fourth-year mechanical engineering student Hillary Okonkwo during his work term at the Vale Long Harbour Project

A co-op placement can play the part of a four-month job interview, too. "In terms of succession planning, it's a wonderful advantage to evaluate a student in the work environment. If it's a good fit they can return for another work term, or even be hired after graduation."

Naterer takes pride in reporting that Memorial's engineering co-op program was recently accredited for the maximum six years by the Canadian Association for Co-operative Education.

"From the beginning, Memorial, and the province, have invested in our co-op program," he says. "We've built a wonderful reputation based on our unique model, and we constantly hear from employers that the calibre of our graduates, in terms of maturity, professionalism, and other work skills, is much higher than those from programs without co-op education." •

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