



UNIVERSITY OF TORONTO
FACULTY OF APPLIED SCIENCE
Troost Institute for Leadership Education in Engineering
TROOST IL

INSPIRING LEADERSHIP 2018/19

Troost Institute for Leadership Education in Engineering

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Inspiring Leadership is the annual review from the Troost Institute for Leadership Education in Engineering (Troost ILead), Faculty of Applied Science & Engineering, University of Toronto. Thank you for reading.

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ENGINEERS LEADING CHANGE TO BUILD A BETTER WORLD



WELCOME

So much can happen in a year. Since becoming director of Troost ILead in 2018, I've come to marvel at how many moving parts there are! From completing our alumni impact study, to sharing our work with Professional Engineers Ontario (PEO), to researching the diverse career paths of engineers, we feel 2018–2019 was by any measure a productive year.

Our annual review highlights our impact on students. This year, we also shine the light on some of the people at Troost ILead who make things happen day in, day out.

On that note, I congratulate Teresa Didiano, our Special Projects Coordinator, who won the Quality of Student Experience Award for Behind-the-Scenes Staff for her vision and execution of our graduate student programs. I also congratulate our benefactor Bill Troost (ChemE 6T7) for receiving an honorary degree from U of T in recognition of his years of service to the university and unwavering support for ILead students.

I hope you enjoy reading about each story in this year's publication as much as I do.

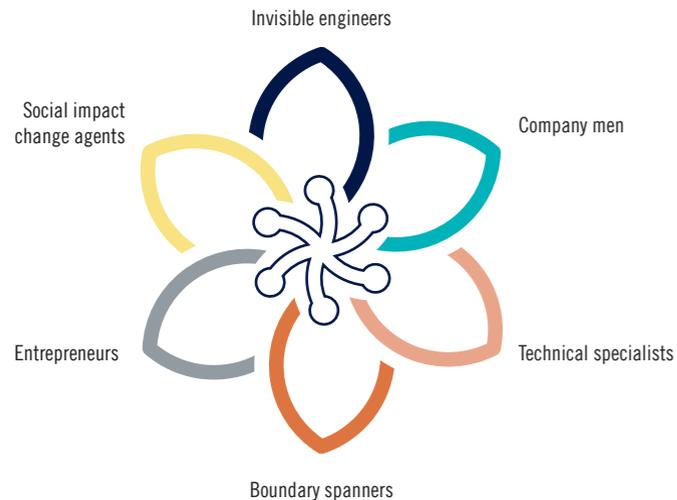


Professor Emily Moore, PhD, PEng
Director, Troost Institute for Leadership Education in Engineering



OPPOSITE, CLOCKWISE FROM TOP-LEFT: Alumnus speaks at Troost ribbon cutting celebration; students at Leadership Lab on meaningful networking; students at Leadership Lab on Public Speaking; our student-staff with team members Jordan Daniow, Teresa Didiano, and Albert Huynh; FIELD Summer Program participants at Evergreen Brickworks. THIS PAGE: ILead pop-up event; visiting scholars Jessica Smith and Juan Lucena at engineering leadership seminar; attendees at same; participants at Community of Practice (CoP) Conference; Summer Fellows with team members Jordan Daniow and Mike Klassen

SEEING UNTOLD CAREER PATHS



Since the 1950s we have assumed that engineers followed one of two career paths: become a manager or stick to the technical path. One of our research projects this year forced us to challenge this preconception.

Through 28 interviews with senior engineers from nine industries, we uncovered six distinct career paths.

Engineers can learn to lead without a formal curriculum, but it takes time and is rarely explicit. The six career paths that we have identified—all of which involve supervision, management, or leadership—reveal how engineers learn to lead while busy doing other things. Our findings suggest that opportunities for upward mobility and corresponding leadership learning differ depending on which career path an engineer is on, leading to equity-related questions ripe for future investigation.

To learn more about our research findings, including descriptions of these six paths and our recommendations to employers and engineering educators, reach out to us at info.ilead@utoronto.ca.



Around here, you don't do a whole lot of things by yourself. It's all teams. You depend on a lot of people that don't necessarily report to you, and yet you find a way to help them out, and they want to help you out.

—Carlos, “invisible engineer” (We used a pseudonym.)



OPPOSITE: Prof. Greg Evans, Director of the Institute for Studies in Transdisciplinary Engineering Education and Practice with industry partners and students at Community of Practice Conference, Nov 2018



MEETING OF THE MINDS: PEO'S NANCY HILL

PEO President Nancy Hill (CivE 8T1) is a longtime supporter of Troost ILead. She called on us to co-design and co-facilitate the agenda at PEO's 2019 Volunteer Leadership Conference, in partnership with the Engineering Change Lab.

This opportunity allowed us to share our leadership philosophy and vocabulary with an audience of engineers from across the province.

Session topics included feedback and tough conversations, accountability in volunteer teams, and high-performance teams. Drawing upon our research, we also facilitated conversations on ethics and equity and the nature of engineering leadership. Our materials reached over 120 councillors, committee and chapter representatives within PEO. At the end of the sessions, participants told us they left with new insights, and wanted to find out how to host similar workshops in their own chapters.

We hope our facilitation will help frame conversations on PEO's future direction as well as spark reflection on the changing engineering profession. We are proud to have been active partners in this important event, one that strengthened our voice within engineering organizations.



Troost ILead highlights for me the importance of being ready, willing, and able to take on a leadership role; being an active participant on a committee; being prepared to be a leader.

—Nancy Hill, President of PEO

SPOTLIGHT ON GREAT TEACHING

Mark Franklin (MEd, PEng, CMF) teaches our graduate course *Engineering Careers*. He's been a teacher with Troost ILead for five years. We chatted with him to learn more about his perspectives as an engineer, educator, and entrepreneur.



You've been teaching engineering leadership for years now. Can you tell us a bit about how you came to partner with Troost ILead?

Career management was one of the skills I felt I needed when I graduated from engineering, but was absent from the curriculum. So when I transitioned after a 10-year career in engineering to career management, I felt well-positioned to suggest such a course to ILead five years ago. Since launching *Engineering Careers* I've also been involved in the OPTIONS program to help PhD students and post-docs explore non-academic careers, and the Grad PACS initiative to help them start career planning.

Can you recall a particular student who approached you and let you know the impact that the material has had on their personal or professional lives?

It's been gratifying to hear positive feedback from so many students over the past few years. Gustavo, an industrial engineer like myself, told me that he engaged in a successful career transition after the course. Diane, an engineering manager, shared concepts that she'd learned in class with her whole team at work. Amy, a civil engineer, used the course to bring her own career transition experience into the classroom.

Looking back on leadership education when you first joined Troost ILead, what changes have you witnessed?

I'm impressed with the expansion of course offerings and the quality of those courses. Students in the MEng program frequently tell me they love ILead courses and wish they could take more of them. I've also noticed the spike in international students. The diversity of students I teach is

breathtaking, with people coming from China, India, Iran, Brazil, Philippines, Israel, Syria, Switzerland and so many more, contributing to our learning community and helping us all understand global engineering practice.

Looking forward, where do you see leadership education evolving? What challenges do you anticipate organizations like Troost ILead will need to tackle?

Being a graduate myself from U of T Engineering, I recognize both the strength of our core engineering education, and our continuous need to develop "power skills" (a.k.a. soft skills or leadership skills) and career management skills. The challenge is to provide relevant skills development that complements an engineering education so students can connect the dots once they find themselves navigating the workforce.

As the person at the head of the classroom, you're the one doing most of the teaching. But what have your students taught you over the years?

Students have taught me that stories matter. While I've been developing and using narrative tools and techniques for a long time, each time a student shares their professional or personal journey with me, I learn something new. I try to support deep reflection, for example, when students play my "Who You Are Matters!" game, so that these stories benefit all.

What's the most rewarding aspect of being a teacher?

I enjoy helping students become more resilient and able to "bounce forward" from inevitable setbacks. After taking my course students may not know exactly what they'll do, but they'll feel more confident, optimistic, and hopeful about managing a lifetime of career transitions. It's been fulfilling to learn together with them and the Troost ILead team!

Read the full interview at ilead.engineering.utoronto.ca/

OPPOSITE: Mark Franklin at Community of Practice Conference, Apr 2019
INSET: Prof. Patricia Sheridan (left) with students

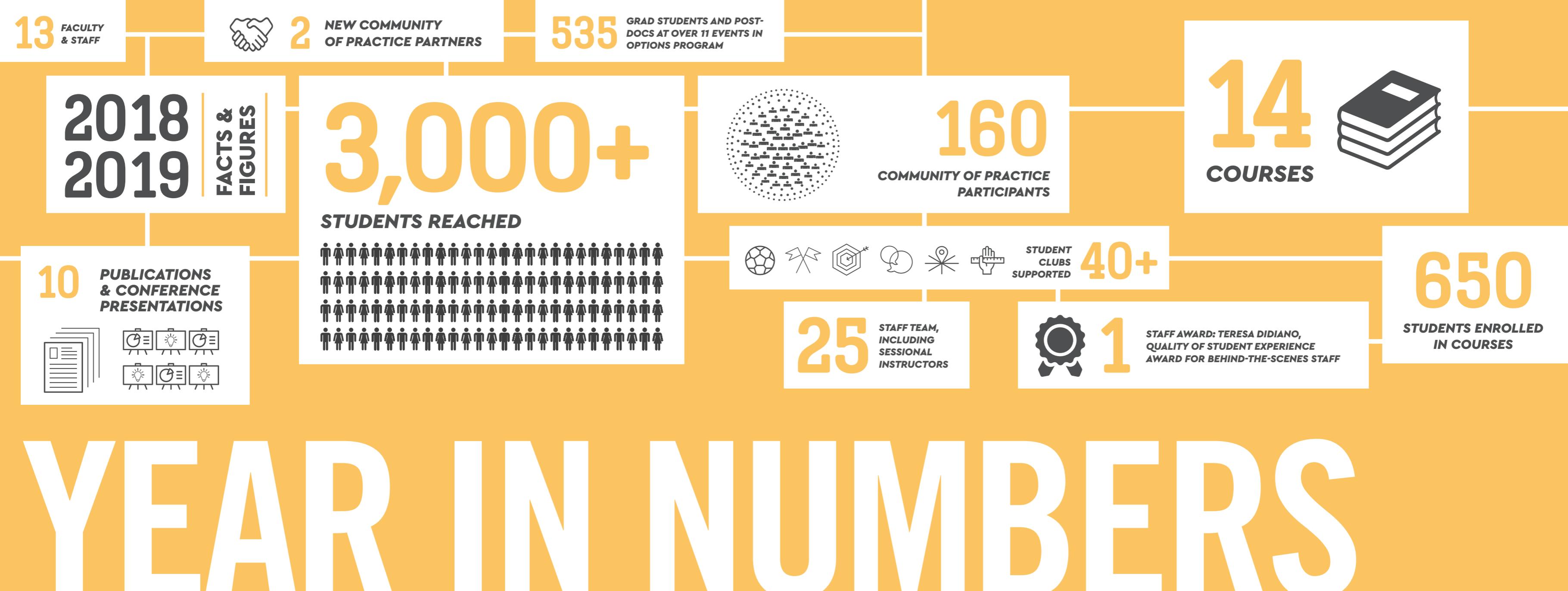


INTEGRATING LEADERSHIP LEARNING INTO CORE CURRICULUM

100%
OF FIRST YEAR STUDENTS

Every first year engineering student now experiences at least six hours of interactive learning on teamwork and leadership.

- Prof. Patricia Sheridan is developing "Leadership and Professional Skills Spines" that will integrate leadership and professional skills instruction in years 1–4 of all undergraduate engineering programs. This work is financially supported by the Dean's Emerging Innovation in Teaching Professorship.
- The Team-effectiveness Learning System expanded to 15 undergraduate courses and one graduate course. All undergraduate students in the Faculty have now used it to provide feedback to their team members a minimum of four times over their degree.
- Dr. Rottmann's ethics and equity case studies expanded into nine courses this year.



13 FACULTY & STAFF



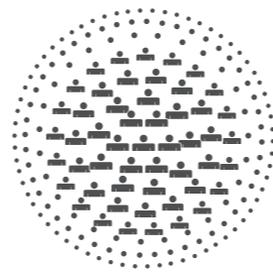
2 NEW COMMUNITY OF PRACTICE PARTNERS

535 GRAD STUDENTS AND POST-DOCS AT OVER 11 EVENTS IN OPTIONS PROGRAM

2018 2019 FACTS & FIGURES

3,000+

STUDENTS REACHED

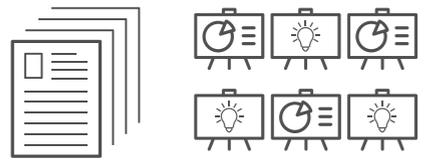


160 COMMUNITY OF PRACTICE PARTICIPANTS

14 COURSES



10 PUBLICATIONS & CONFERENCE PRESENTATIONS



STUDENT CLUBS SUPPORTED **40+**

25 STAFF TEAM, INCLUDING SESSIONAL INSTRUCTORS



1 STAFF AWARD: TERESA DIDIANO, QUALITY OF STUDENT EXPERIENCE AWARD FOR BEHIND-THE-SCENES STAFF

650 STUDENTS ENROLLED IN COURSES

YEAR IN NUMBERS



A good engineer is a technical expert in his field of work. But an effective engineer is a leader that can elevate his or her team by inspiring others while creating a comfortable atmosphere for learning and growth. Leadership education is a crucial component in fostering these engineering leaders by creating a foundation to succeed.

—Morris Huang, Summer Fellow



Leadership education is a tool for engineers to problem solve and produce high-quality results. ILead's courses, workshops, and Summer Fellowship program gave me the confidence to fully own my leadership style and pursue opportunities to develop it further.

—Julia Filipic, Summer Fellow





THE GIFT OF SPACE

In July 2018 the Troost ILead team packed up boxes upon boxes of learning materials and moved them from their cramped space in the Wallberg Memorial Building to the seventh floor of the Myhal Centre for Engineering Innovation & Entrepreneurship.

Our new home, made possible by the enduring philanthropic support of Bill and Kathleen Troost, demonstrates the importance of leadership programming to the Faculty.

We are now located in a transdisciplinary space where we can benefit from proximity to organizations such as the Centre for Global Engineering, the Entrepreneurship Hatchery, the Office of Advancement and Alumni Relations, and the School of Cities. Students have more room to experiment with leadership concepts. Researchers and program experts can access facilities that reflect the ambition of their work. Our position within the Myhal Centre anchors us to an engineering-wide hub of activity.



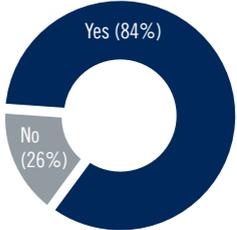
Our move to Myhal signifies Troost ILead's maturity and recognizes the growth and success of our team's dedicated work. In the new space we have room to spread our wings and to build exciting collaborations that will further enhance our reach and our impact.

—Annie Simpson, Associate Director of ILead

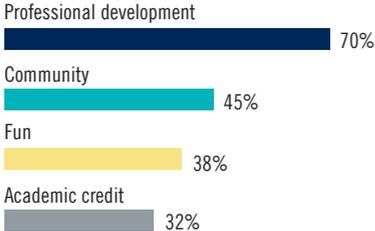
OPPOSITE, CLOCKWISE FROM LEFT: Students at Leadership Lab on public speaking; Kathleen and Bill Troost at ribbon cutting ceremony of new office suites in Myhal; Troost ILead team with Bill Troost and then Dean Cristina Amon

FINDINGS FROM ALUMNI IMPACT STUDY

Do alumni identify as leaders?
Most respondents said “yes.”



Motivations for engaging with Troost ILead



How does our work affect students after they’ve graduated? To answer this question, we surveyed 806 alumni and interviewed 25 others who’ve engaged in our co-curricular programs and academic courses.

KEY FINDINGS

We reached out to 4000 alumni who graduated between 2002–2018. This time frame represents 16 years of programming going all the way back to Troost ILead’s earliest beginnings as a small leadership program in the Department of Chemical Engineering & Applied Chemistry. We wanted to understand which courses and programs our alumni had participated in, and what the impact had been. We learned that high intensity engagement translated into leadership development. Alumni who had engaged in both curricular and co-curricular programming reported the greatest impact.

In our interview with 25 alumni, we found that three themes emerged:

1. ILead equips students with professional skills not present in engineering curriculum, helping with workplace readiness.
2. ILead provides a space for engineering students to explore who they are.
3. ILead has a larger societal impact, creating engineers who see themselves as leaders and purveyors of positive change.

Our alumni impact study encourages us to engage more with alumni as well as to continue our work embedding leadership education more deeply into core curriculum.

I believe ILead has been of incredible support for professional growth. This led to my interest in developing a technology-backed product/service...the support from ILead has been of phenomenal help in achieving that ambition.

—Ahsan Malik, MechE 2017
Project Management Intern at Magna International





LOOKING BACK, LOOKING FORWARD, WITH EMILY MOORE

What's your favourite part of the job so far?

Being focused on engineering leadership full time. I have always had a passion for developing people, but it was only a small part of my day-to-day work as a business leader. Now, everything I do is unified by the question "How can we help engineers to become better leaders?"

What's it been like interacting with U of T Engineering students?

I have been so impressed by their curiosity and their passion. Our leadership courses ask students to explore areas that conventional engineering courses don't cover. The students are incredibly willing to jump in and experiment, to explore aspects of themselves that they haven't had to look at before. The discussions in our classes are fantastic.

What's the biggest surprise you've encountered going from industry to academia?

The pace! There is a misconception that academia is slow moving. Institutionally things change slowly because of the complexity of the system, but the university is incredibly entrepreneurial. If a professor has a great idea, they can introduce it into a lecture, create a new course, or generate a research proposal to move it forward. Good ideas and creativity are rewarded. The development of Troost ILead under previous director Doug Reeve is a great example of this.

We end our annual review with a chat with Director Emily Moore to learn more about her perspectives and her vision as ILead's current director.

What challenges do you see on the horizon for engineering education and how do you think we should tackle those challenges?

It is widely accepted that our graduates are heading into a rapidly changing, highly complex world. We need to find ways to help students navigate that complexity. The engineering curriculum is already packed with technical requirements so it is impossible to keep piling courses on to cover new skills. We need to get creative in infusing transdisciplinary skills and experiential learning into the core curriculum.

If you could wave a magic wand and change one thing about the way people thought about Troost ILead, or leadership education more broadly, what would it be?

That engineering is a leadership profession, and leadership skills should be part of any engineer's skill set.

Looking back on 2018-2019, how would you summarize the impact that ILead has had on students, researchers, or industry partners?

We continue to advance the conversation on what engineering leadership is and I believe that we are inspiring more engineers to step into leadership.

**THANK YOU FOR
YOUR SUPPORT.
SEE YOU NEXT YEAR!**

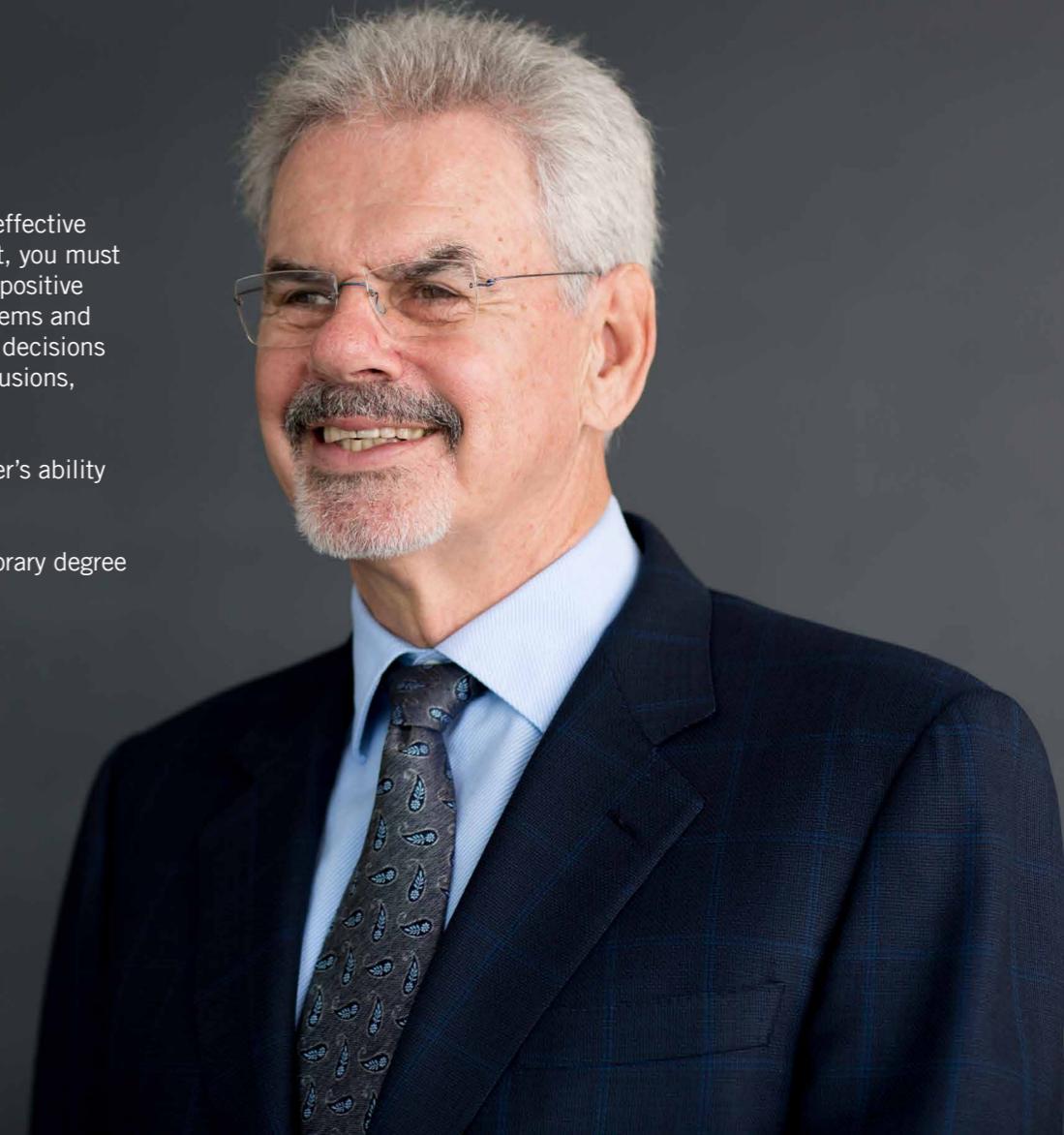


Message to the Class of 2019:

Technical mastery by itself does not make you an effective and efficient engineer. To be effective and efficient, you must be able to translate your technical knowledge into positive change. You must be able to quickly identify problems and opportunities, and you must be able to make right decisions based on incomplete information, leading to conclusions, recommendations and action.

Thus leadership is a core component of an engineer's ability to translate technical skills into practice.

—Bill Troost, ChemE 6T7, recipient of U of T honorary degree



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