10

Diversity deepens the engineering creative process, accelerating innovation and enriching our profession with new ideas and perspectives. We are committed to ensuring that our Faculty reflects the diversity of our society, and provides an environment that inspires our students to consider how engineers' contributions impact people of all backgrounds and abilities.

We are fostering a diverse, inclusive and respectful environment where these values are incorporated into the policies, guidelines and procedures of our Faculty. For the last two years, women have made up more than 40% of our incoming undergraduate cohort, the highest proportion of any Canadian engineering school. We expect a similar proportion in September 2018. Across all years of study, our undergraduate body is now more than 33% women, compared to the Canadian average of 20.7%*, which demonstrates our leadership in Engineers Canada's efforts to raise the percentage of newly licensed women engineers to 30% by the year 2030.

Our proportion of women professors in engineering has doubled over the last decade and is now more than 20%, the highest for any Canadian university in the U15 group of research-intensive institutions*. More than one third of our Canada Research Chairs are women, and women engineers lead many of our multidisciplinary research centres and institutes. They also hold positions of senior leadership at the University level.

The Eagles' Longhouse Indigenous Initiatives Steering Committee, chaired by Professor Jason Bazylak, our newly appointed Dean's Advisor on Indigenous Initiatives, has created a *Blueprint for Action* which outlines how we will increase Indigenous peoples' participation in engineering education. This year we also introduced a Dean's Advisor on Black Inclusivity Initiatives and Student Inclusion & Transition Mentor to enrich all students' experiences in our Faculty and to guide our efforts in increasing Black representation within our programs and the engineering profession. In addition, the Engineering Equity, Diversity and Inclusion Action Group (EEDIAG) was formed to bring together a variety of Faculty-wide diversity and inclusivity initiatives. It aims to ensure all members of our community support the shared mission of an enriching, inclusive learning and working environment.

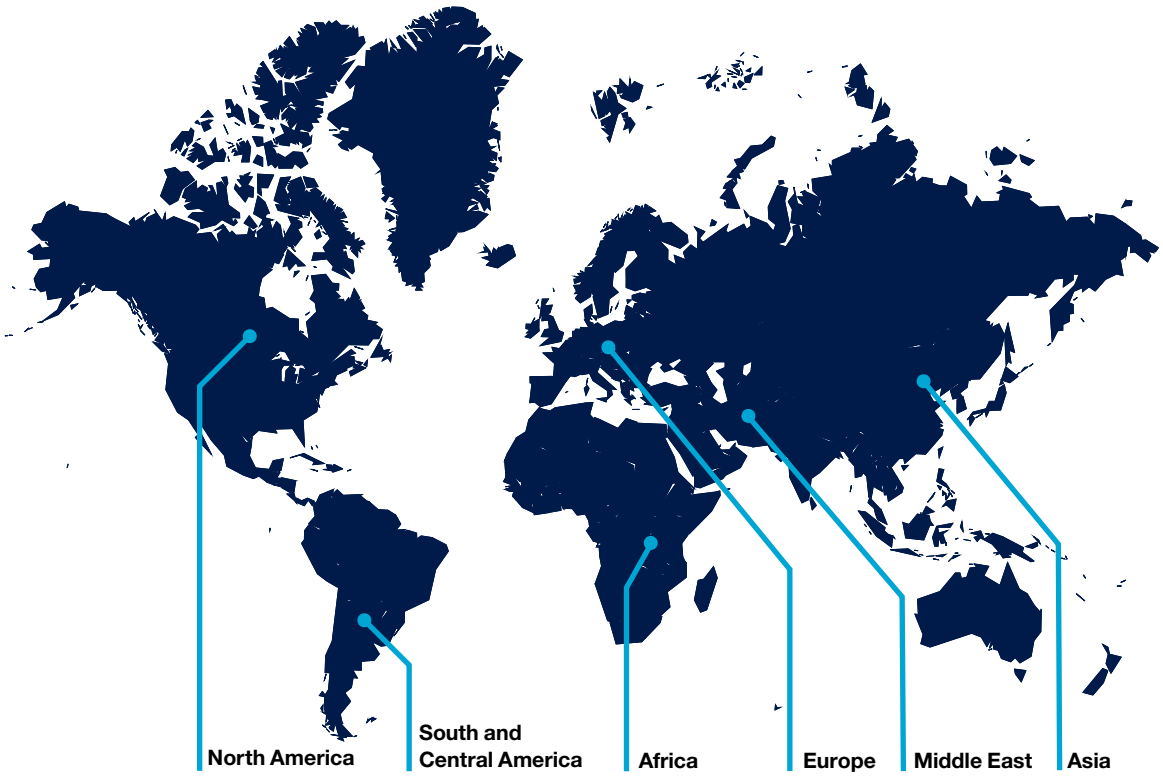
* Canadian Engineers for Tomorrow: Trends in Engineering Enrolment and Degrees Awarded, Engineers Canada, 2016

Diversity: Measures of Progress

International Diversity

Over the last 10 years, the number of international students has doubled, comprising 28.6% of all undergraduates in 2017–2018. Among graduate students, 32.4% hail from outside of Canada, up from 16.8% in 2008–2009. Not only are more international students choosing U of T Engineering, but they are also coming from a wider range of countries than ever before. This is due in part to strategic recruitment efforts in key regions, including Brazil, Colombia, Costa Rica, Ecuador, India, Malaysia, Mexico, Peru, Singapore, Trinidad & Tobago, Turkey, the United Arab Emirates and the United States. *(For more information about our international recruitment initiatives, please see Chapter 9: International Initiatives.)*

Figure 10.1 **Continent of Origin: Undergraduate and Graduate Students, Fall 2017**



	North America	South and Central America	Africa	Europe	Middle East	Asia
Undergraduate Students	56.0%	1.1%	0.9%	1.5%	3.6%	36.9%
Graduate Students	49.8%	1.5%	1.6%	3.1%	11.4%	32.6%
Overall	54.1%	1.2%	1.1%	2.0%	6.0%	35.5%

Data and highlights in this chapter are from September 2017 to August 2018.

Note 10.1: Not shown—0.1% of undergraduate and graduate students from Oceania, which includes Australia, New Zealand and other countries in the Pacific Ocean. Country of origin is derived from a combination of citizenship, location(s) of previous studies (e.g., elementary school, high school and university) and permanent address. This information does not indicate current Canadian immigration status, which is used to determine domestic/international student status for tuition and funding purposes.

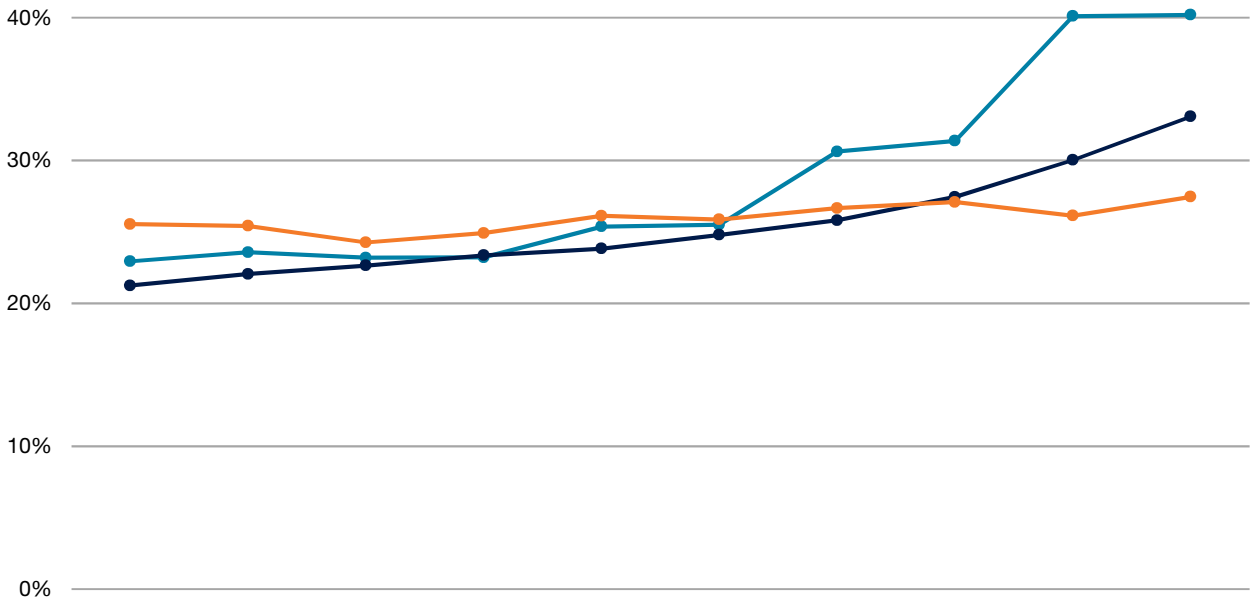
Outreach and Inclusivity

Across all of our programs, the proportion of women undergraduate students now stands at 33.1%, the highest in Canada. Our strategic approach to outreach and recruitment recognizes that talented women who would excel in other science disciplines would also excel as engineers. We aim to inspire these students by increasing awareness of the engineering profession and demonstrating the positive impact they can make as engineers.

Events such as the Young Women in Engineering Symposium (YWIES) and the Girls' Leadership in Engineering Experience (GLEE) provide this inspiration, and also enable prospective students to meet with the Dean, professors, alumni and current students and to learn about their experiences studying and working in engineering.

For the fourth annual YWIES event, we shifted our focus from young women in Grade 12 to those in Grade 11, enabling us to connect with students earlier in their decision-making process. In May 2017, we attracted 76 top female students from across the Greater Toronto Area to U of T where they learned more about engineering, participated in hands-on workshops and met students, faculty and alumni. Twenty-nine of the attendees ultimately applied to U of T Engineering. For our fifth annual symposium in May 2018, we attracted 84 students.

Figure 10.2 **Percentage of Women Students, 2008–2009 to 2017–2018**



	2008–09	2009–10	2010–11	2011–12	2012–13	2013–14	2014–15	2015–16	2016–17	2017–18
First Year Undergrad	22.9%	23.6%	23.2%	23.2%	25.4%	25.5%	30.6%	31.4%	40.1%	40.2%
All Undergrad	21.3%	22.1%	22.6%	23.4%	23.8%	24.8%	25.8%	27.4%	30.0%	33.1%
Graduate Students	25.5%	25.4%	24.3%	24.9%	26.1%	25.9%	26.7%	27.1%	26.1%	27.5%

The annual, weekend-long GLEE program inspires and empowers women who have received offers of admission to our undergraduate programs by connecting them with women faculty members, students and alumnae. It includes a dinner and reception, hosted by the Dean, as well as a keynote address from one of our women professors. Ninety-nine of the 115 students participating in GLEE 2017 accepted our offers of admission. Two events were held in 2018: one in March that attracted 12 students from outside Ontario, and one in May that saw 105 students from within Ontario.

In 2017–2018, we engaged more than 7,500 pre-university students, approximately half of whom are girls, through our innovative outreach programs, such as:

- Da Vinci Engineering Enrichment Program (DEEP) Summer Academy, which provides high school students from around the world with the opportunity to engage in experiential learning activities in a variety of engineering, technology, business and science disciplines;
- Jr. DEEP and Girls' Jr. DEEP summer day camps and Saturday programs, which enable students in Grades 3 to 8 to explore engineering; and
- Go Eng Girl and Go CODE Girl workshops, which enable girls in middle and high school to explore engineering and computer coding.

Since 2010, we have partnered with the U of T chapter of the National Society of Black Engineers (NSBE) to deliver ENGage, a week-long day camp for students in Grades 3 to 8 that provides participants with on-campus activities that demonstrate engineering principles and practices.

In 2016–2017, we piloted ENGage Community Camp, which offers one-week camps in schools and community centres in areas identified as under-served. While not limited to Black participants, this program, like all ENGage programs, operates on a barrier-breaking model and all participants come from underrepresented communities. In 2018, this program was renamed LAUNCH: Science & Engineering Community Camps. We expect approximately 140 participants this year. The engaging week-long program is based on popular activities, experiments and projects from our 30-year history of STEM outreach on the St. George campus, now offered in schools throughout Ontario.

In addition to ENGage programs offered through our Engineering Outreach Office, the Faculty delivers the Urban In-School Workshop program (ISW), which has been running for more than 20 years. The program provides more than 100 STEM-related workshops each May and June that are delivered in schools within at-risk communities by U of T Engineering students.

In February 2018, we partnered with the U of T NSBE chapter and two other chapters to host the NSBE Region 1 East Canada Zone conference. Held during Black History Month, the conference aimed to both inspire high school students to consider pursuing STEM fields in college and university, and strengthen the NSBE pipeline that will help those students successfully transition into their careers and excel in leadership positions. The theme of the one-day event was 'Ignite, Imagine, Innovate'. It included engineering activities, networking sessions and panel discussions around career development and diversity in the workplace.

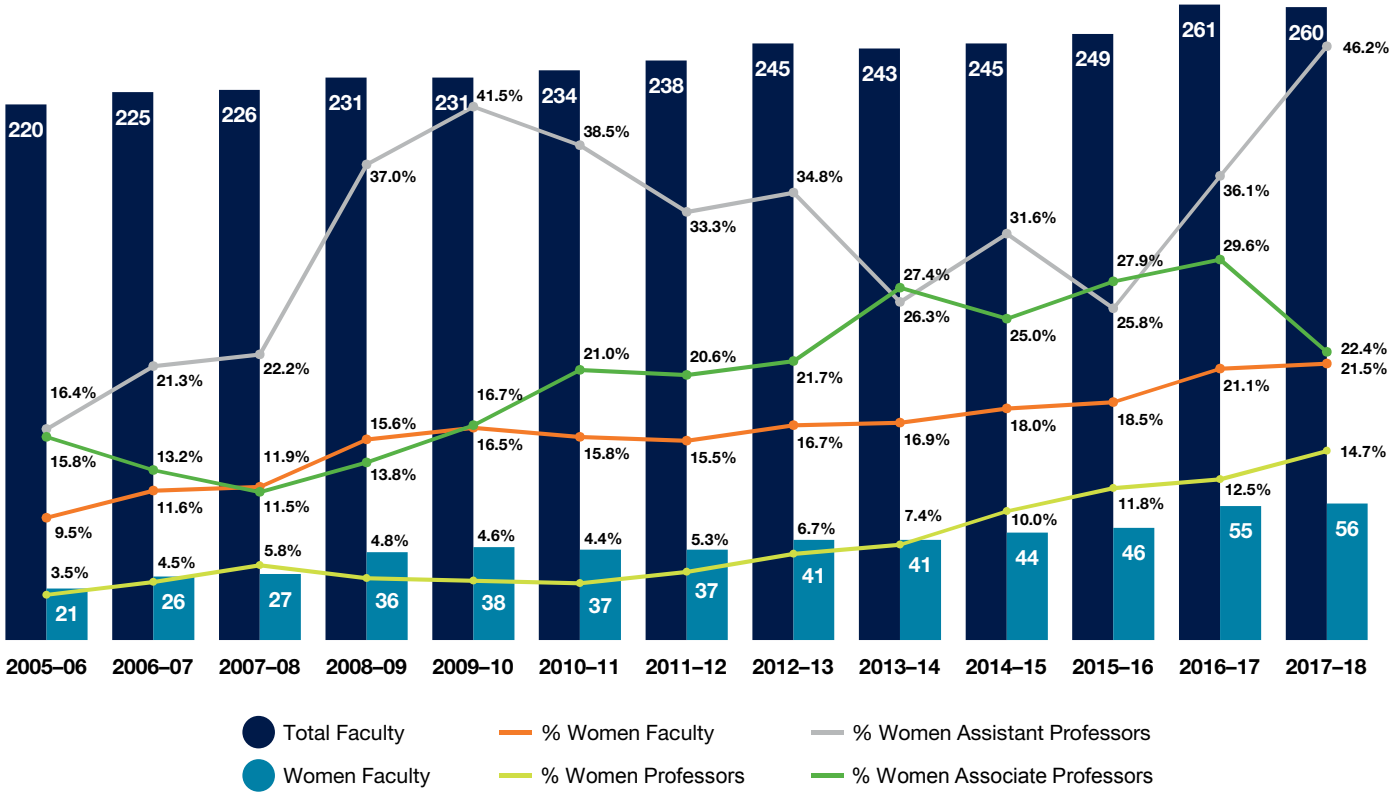
We also partner with U of T Engineering undergraduate students, including members of the Engineering Society's Hi-Skule outreach group and Women in Science and Engineering (WISE), to visit schools throughout the province each year. These STEM ambassadors lead students in immersive workshops on engineering topics, acting as mentors and sharing the boundless possibilities of an engineering education with students of all backgrounds.

- In 2017–2018, Hi-Skule visited 15 schools in the Greater Toronto Area, reaching more than 500 students. They interacted with approximately 500 more through five additional outreach events, including a Welcome to Engineering event on campus, a Mentorship Coffee House, the University of Toronto High School Design Competition and Designapalooza, a new event focused on students in Grades 5 through 8.
- WISE recruited 17 student ambassadors and delivered a total of 26 presentations through high schools and organizations such as Big Brothers/Big Sisters. WISE also led a successful high school mentorship program and organized events such as the on-campus event "STEM Student for a Day," a high school conference and design challenge. In total, WISE reached more than 1,700 students in 2017–2018.

Building a Diverse Professoriate

Increasing gender diversity among our faculty is an important effort toward creating a culture of inclusivity at U of T Engineering. The proportion of women among our faculty population has increased over the last decade and now stands at 21.5%. This is higher than any other Canadian engineering school in the U15 group of research-intensive institutions*. Nine women working at the forefront of engineering education and research were among the 14 professors who joined our Faculty in 2016–2017. Each brings a unique passion for experiential engineering education and research expertise that addresses important engineering challenges around the world, from sustainability in the mining sector to optimizing health-care systems.

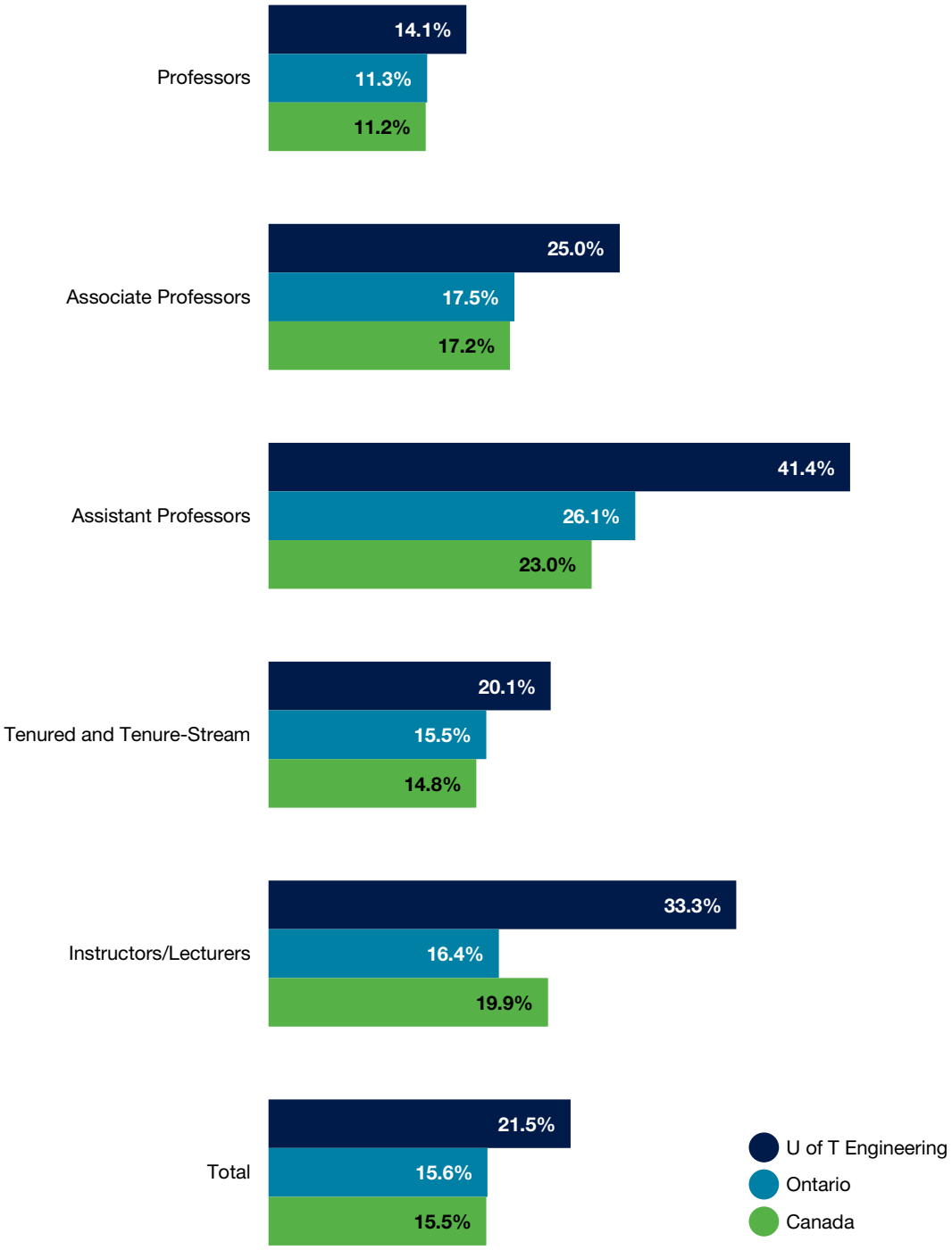
Figure 10.3 **Total Number of Faculty with Percentage of Women Overall and by Academic Rank, 2005–2006 to 2017–2018**



Note 10.3: Data for this figure are based on headcount.

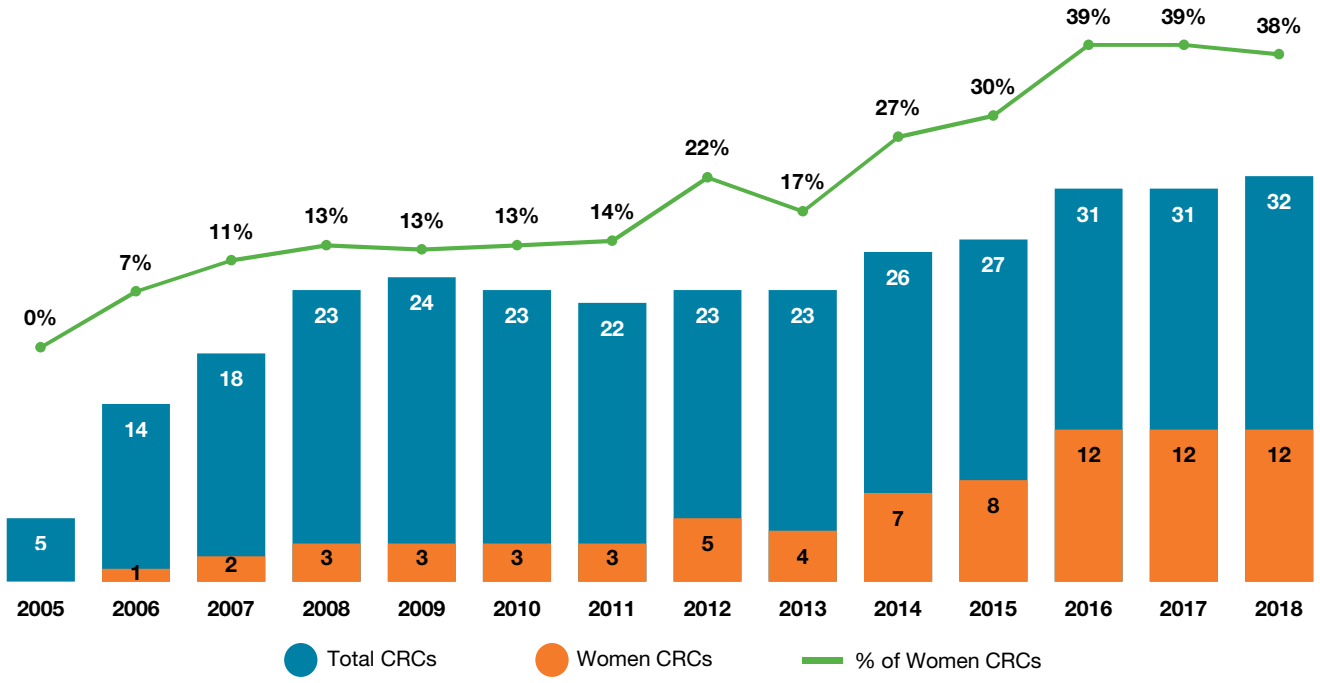
* Canadian Engineers for Tomorrow: Trends in Engineering Enrolment and Degrees Awarded, Engineers Canada, 2016

Figure 10.4 Percentage of Women Faculty at U of T Engineering Compared with Women Faculty in Ontario and Canadian Engineering Faculties, 2017



Note 10.4: Data in this figure comes from Engineers Canada. Counts are based on full-time equivalent (FTE) faculty as of November 15, 2017.

Figure 10.5 **Canada Research Chairs with Number and Percentage of Women Chairholders, 2005 to 2018**



Indigenous Youth and STEM

We are working with U of T's First Nations House and with Indigenous peoples and communities to increase the number of Indigenous students who apply to and enrol in U of T Engineering programs, and to ensure a welcoming, supportive and inclusive environment for all students, faculty and staff.

Following the Truth and Reconciliation Commission of Canada's call to eliminate educational gaps between Indigenous and non-Indigenous peoples, the University of Toronto published a report, *Answering the Call: Wecheehetowin,* which outlined proposed actions in six key areas: Indigenous spaces, Indigenous faculty and staff, Indigenous curricula, Indigenous research ethics and community relationships, Indigenous students and co-curricular education, and institutional leadership and implementation.

In 2017, we established the Eagles' Longhouse, our Engineering Indigenous Initiatives Steering Committee, with members from across our Faculty and the Oneida Nation. The mandate of the Eagles' Longhouse is to engage Indigenous representatives and engineering educators to design a *Blueprint for Action* to ensure a welcoming and supportive environment and to intensify engineering outreach to these underrepresented communities. The committee is chaired by Professor Jason Bazylak (MIE), who was also appointed to the newly created role of Dean's Advisor on Indigenous Initiatives.

The *Blueprint for Action* was delivered in June 2018 and is available online (www.uoft.me/BlueprintforAction). Its recommendations are divided into four areas with immediate, short-term and long-term actions, including:

- **Indigenous Spaces:** Form an ongoing Indigenous Space Committee, involving Indigenous community members, to develop or redevelop existing spaces as Indigenous spaces, commission Indigenous artwork and create educational installations.
- **Indigenous Curriculum:** Integrate Indigenous content into existing curricula.
- **Indigenous Student Access:**
  - Tailor recruitment activities to Indigenous students, including scholarship opportunities and a website with specific content for Indigenous students.
  - Create a network of Indigenous engineers and educators to support mentorship and outreach programs.
  - Initiate an engineering outreach program for Indigenous high school students, and create a transition program for Indigenous students in Grade 10 math to enter engineering at U of T.
- **Indigenous Faculty and Staff Recruitment and Hiring:** Support a program focused on the recruitment and hiring of Indigenous faculty and staff.

Diversity: Selected Highlights

Dean's Advisor on Black Inclusivity Initiatives and Student Inclusion & Transition Mentor

In March 2018, Mikhail Burke (MSE 1T2, IBBME PhD 1T8) was appointed to the new role of Dean's Advisor on Black Inclusivity Initiatives and Student Inclusion & Transition Mentor at U of T Engineering. As a student, he was instrumental in founding the ENGage outreach program and served as president of the National Society of Black Engineers' U of T chapter. The new role is an important part of our Faculty's commitment to addressing the local and systemic issues that result in overt and subtle racism, which impact the welcoming and respectful nature of our community. Burke is leading our effort to develop a plan for creating a more inclusive learning environment, serving on a steering committee that has a mandate to improve the experience of Black students, and acting as a Faculty liaison for relevant internal and external groups to ensure good communication of shared efforts and priorities. He is a supportive contact within our Faculty in a mentorship capacity for all students that may be facing difficulties in their transition into the community.

Indigenous Community Outreach Projects

U of T Engineering is spearheading three Indigenous community outreach projects, with support through the Dean's Strategic Fund (DSF).

- **Engineering outreach in Labrador:** Led by professors Erin Bobicki (MSE, ChemE) and Naomi Matsuura (IBBME, MSE), this project aims to alleviate the geographic, financial and cultural challenges faced by Indigenous students in accessing engineering education in Labrador, and to spark interest in engineering as a career path. The week-long program will be offered in five local schools for students ages 13 to 18, who will work on design projects that address engineering challenges relevant to their communities.
- **Drone design at high schools:** Partnering with the Dennis Franklin Cromarty High School in Thunder Bay, this project aims to teach science students to design and build drones, providing insight into the many applications that could benefit their communities. The project is led by UTIAS professors Craig Steeves and Jonathan Kelly.
- **Reconciliation Through Engineering Initiative (RTEI):** This project, led by the Centre for Global Engineering (CGEN), aims to identify pressing engineering challenges facing geographically disparate Indigenous communities across Canada; work to co-design sustainable solutions and help build the technical capacity to support them; and enable pathways for future research. Researchers will spend time embedded within a number of Indigenous communities and work collaboratively with their members and elders.

Diversity Climate Survey

The Community Affairs and Gender Issues (CAGI) of Faculty Council is developing a Diversity Climate Survey. The goal of this initiative is to assess diversity and inclusion within our community along various dimensions, including ethnicity, gender and sexual orientation, religion, age, ability, legal status and socioeconomic background. By providing baseline data, the survey will serve as an important first step to identify underrepresented groups and issues of marginalization, discrimination, disparagement or alienation and to inform policies and initiatives as needed to support these groups.

Throughout 2017–2018, CAGI consulted widely with faculty, staff and students on the scope of the questions asked. The final survey is expected to be ready for implementation during the 2018–2019 academic year.

Symposium on Inclusive Learning Environments for First-Year Students

On June 26, 2018, U of T Engineering hosted the second annual Ontario First Year Engineering Experience Symposium (OFEE). Created at U of T Engineering and unique in Canada, OFEE brings together students, academic advisors, faculty, student support professionals and administrators to discuss enhancements to the experience of first-year engineering students. This year's event focused on co-creating inclusive learning environments that enable students to develop their professional engineering identities. Attendees discussed strategies for acknowledging and celebrating the diverse experiences of students, adopting inclusive classroom practices, strengthening student support and building communities to share knowledge across institutions. More than 60 people from 11 Ontario engineering schools attended. The long-term goal is to expand this annual conference into a national event.

WISE Conference Highlights Professional and Personal Development

More than 300 leading academics, industry professionals and students from universities across Canada convened at U of T Engineering in February 2018 for the sixth annual Women in Science and Engineering (WISE) national conference. The two-day event serves as a catalyst to inspire and empower young women to pursue their passions, broaden their horizons and form meaningful connections. This year's theme was Transcend Boundaries, and the organizing team doubled both the number of sponsor companies and the number of workshops, which covered topics ranging from energy and automation to blockchain technology, bioinformatics and career building.

U of T Engineering Partners with SOAR Indigenous Youth Gathering

Since 2009, U of T's Faculty of Kinesiology & Physical Education has invited approximately 20 Indigenous youth aged 14 to 17 to the University during March Break for SOAR Indigenous Youth Gathering. The event enables these students to experience life at U of T, visit Toronto landmarks, and participate in a series of recreational and Indigenous-focused events and activities. This year, Professor Jason Bazylak (MIE) partnered with the program to deliver a workshop that introduced key concepts of the engineering design method. The workshop ended with a discussion about the need for more Indigenous engineers to help build stronger Indigenous communities.

Engineering Equity, Diversity and Inclusion Action Group (EEDIAG)

The newly created Engineering Equity, Diversity and Inclusion Action Group (EEDIAG) is committed to creating a culture of diversity, equity and inclusion that represents, acknowledges and respects all members of our community.

With representation from students, staff and faculty, the group will work to accomplish the goals related to equity, diversity and inclusion in our Academic Plan for 2017–2022 by identifying barriers to access and inclusion of underrepresented groups in engineering, as well as fostering more inclusive spaces within our Faculty.

We are liaising with our counterparts across the University — including peers at Rotman Commerce, Kinesiology & Physical Education, the Centre for Teaching Support and Innovation, and the Sexual and Gender Diversity Office — to develop EEDIAG's mission and values. We will also consult with others working on equity, diversity and inclusion initiatives in the broader engineering profession.

Rainbow Railroad Fundraiser and Pink Shirt Day

Our Faculty continues to raise awareness of LGBTQ+ perspectives and experiences, and has been represented on the U of T Positive Space Committee since its inception in 1996. The committee promotes safe and inclusive spaces for LGBTQ+ students, staff, faculty, alumni and allies. These spaces are marked by rainbow triangle stickers posted on doors and in offices across campus. U of T Engineering is also home to Queer Sphere, the student chapter of EngiQueers Canada, which promotes and advocates for the inclusion of LGBTQ+ students (and their allies) in engineering schools across Canada. On February 14, 2018, Queer Sphere hosted an event in the Sandford Fleming Atrium to raise money for Rainbow Railroad, an organization that supports and assists LGBTQ+ people who have faced physical violence, threats of violence or imprisonment in their current country of residence, including helping these individuals find safe local resources and routes for escape if the situation becomes dire. Queer Sphere and the Engineering Positive Space Committee also led the celebration of Pink Shirt Day on February 28, 2018. The annual event, which aims to end bullying, began after students at a Nova Scotia high school wore pink shirts to support a boy who had been bullied for wearing a pink shirt. Members of the U of T Engineering community posted photos of themselves wearing pink shirts on social media using the hashtag #pinkskule.

New Verses for Godiva's Hymn

The song known as "Godiva's Hymn" is a long-standing tradition in Skule™ and at many other engineering schools across Canada and around the world. The Godiva's Hymn contest, held by U of T's Engineering Society (EngSoc) for the last two years, encourages students to contribute verses that echo the spirit of the 21st-century engineer. This year's winning verse, contributed by MSE student Calvin Huynh, was:

At Frosh Week Does It All Begin, With Cheers and Purple Dye /
And Then Before We Know It We've Returned From PEY /
We Made It Through The Many Years With Blood And Sweat And Tears /
Though Time May Pass We Shan't Forget – I Am An Engineer!