

1

Our exceptional academic programs, unparalleled co-curricular opportunities, world-renowned research and teaching, and reputation as a global leader in engineering education continue to attract the most promising future engineering innovators and entrepreneurs from across Canada and around the world.

We received a record number of undergraduate applications in 2016, enabling us to be more selective than ever in our offers of admission: for each space in our programs, we received more than 12 applications. Our students are entering with high achievements and grade point averages, which demonstrate the overall quality of our applicants. Once they are here, the depth and breadth of our resources that support student learning and well-being contribute to our increasing retention rate from first year to second year.

The thriving culture of inclusivity at U of T Engineering enhances creativity, collaboration, communication and innovation, which are at the heart of the engineering profession. In 2016, our entering undergraduate cohort was one of the most diverse first-year classes in our history. Women comprised 40.1% of our first-year class — the highest proportion of any engineering school in Canada — and more than one in four entering undergraduates came from outside of Canada. We also continue to work closely with U of T's First Nations House to strengthen our relationship with Indigenous peoples and communities and intensify our outreach and recruitment efforts.

We enhance the student experience by enriching our courses and co-curricular activities with opportunities for experiential learning. Through online courses, our Technology Enhanced Active Learning (TEAL) classroom, a wide variety of design team opportunities, Professional Experience Year (PEY) internships and international exchanges, we offer the ideal environment for the next generation of global engineering leaders to prosper.

This environment will be further strengthened by the forthcoming Centre for Engineering Innovation & Entrepreneurship (CEIE), which will open its doors in 2018. The CEIE will set a new standard of excellence in undergraduate teaching and research, and will house facilities that support innovative pedagogies as well as makerspaces to enable multidisciplinary collaborations among students, industry partners and alumni.

Admissions and First-Year Students

We received a record 12,298 applications for admission from across Canada and around the world in 2016, an increase of 7.7% from the previous year and more than 40.6% from five years ago. Our positive global reputation and the success of our international recruitment strategy drew 10.8% more international student applications than in 2015, while domestic student applications increased by 6.1%. (For more details, please see Chapter 10: Diversity.)

Figure 1.1a Applications, Offers, Registrations, Selectivity and Yield of First-Year Undergraduates, 2007 to 2016

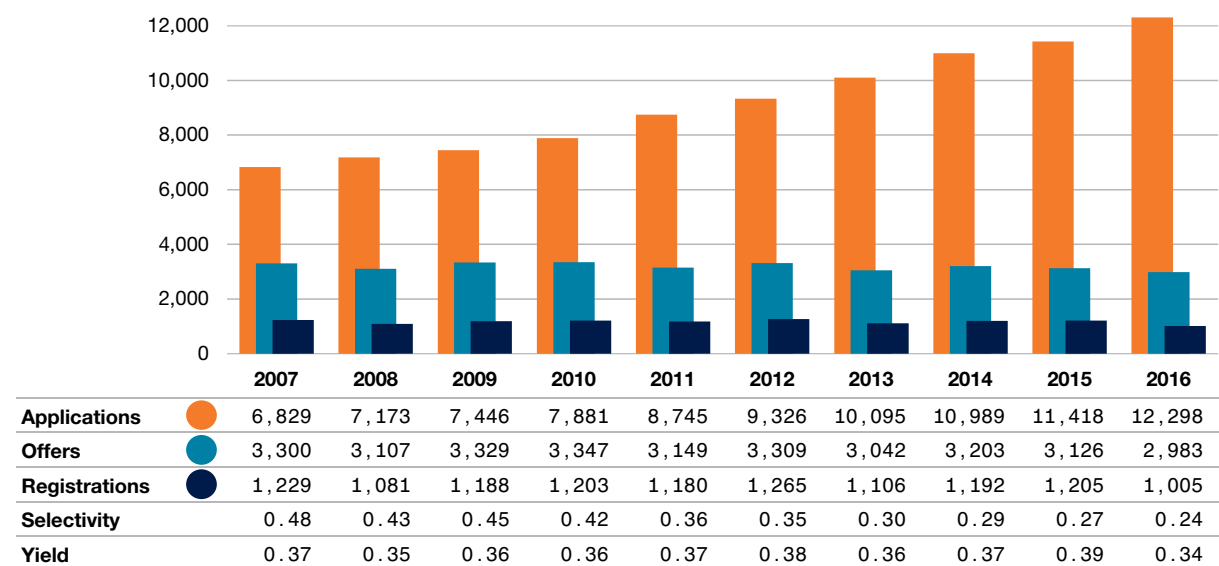
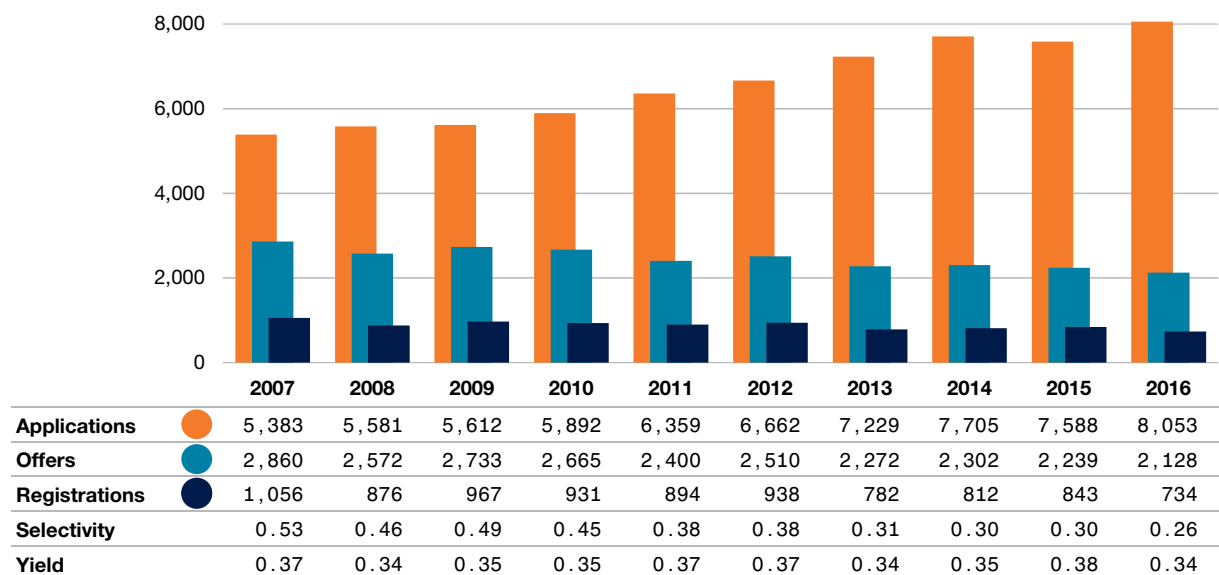


Figure 1.1b Applications, Offers, Registrations, Selectivity and Yield of Domestic First-Year Undergraduates, 2007 to 2016



Data in this chapter are presented by academic year (September to August). Highlights are from July 2016 to June 2017.

Note 1.1a, b, c: Student counts are shown as of November 1. Applications and offers are for the fall admissions cycle.

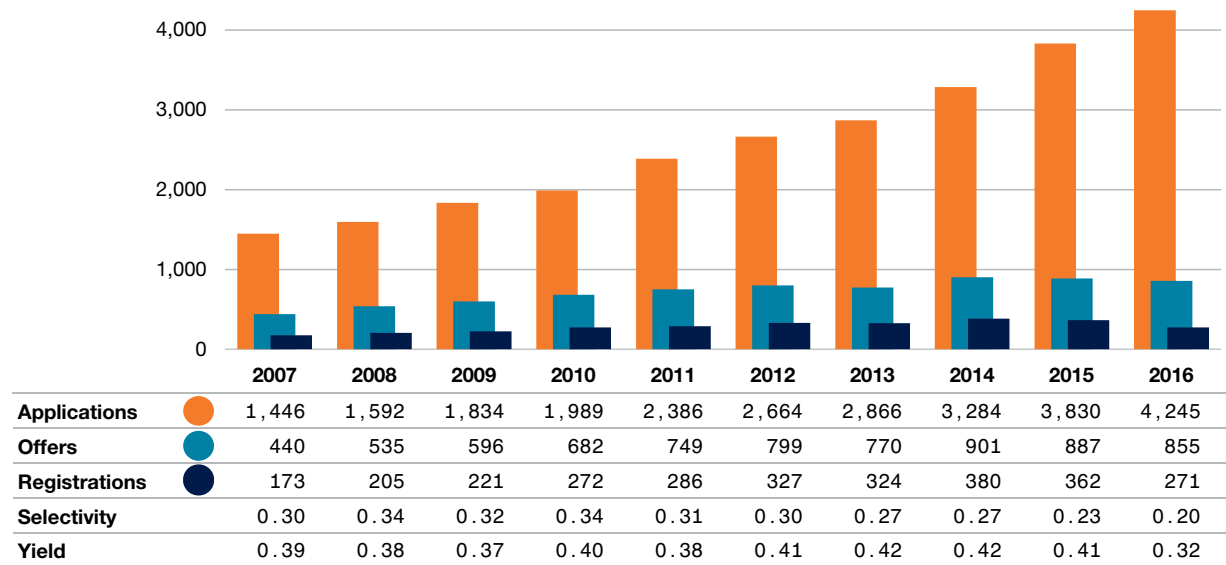
Selectivity = offers ÷ applications and represents the proportion of applicants who were offered admission. Yield = registration ÷ offers. Domestic students are defined as citizens (living in Canada or abroad) or permanent residents of Canada.

Our worldwide reputation as a leader in engineering education and research, strong global rankings, rigorous broad-based admissions process and targeted recruitment strategies resulted in one of the most accomplished entering classes in our history. In 2016, we increased our selectivity, resulting in offers of admission to 24% of applicants compared with 27% in 2015. The mean entering average of incoming Ontario secondary school students was 93.2%, up from 92.4% in the two previous years.

This year was the last in a three-year pilot project to assess applications using an enhanced broad-based process, which provides a more comprehensive understanding of each applicant’s candidacy than

grades alone. It allows us to extend offers to students who will best thrive in our enriched experiential and collaborative learning environment. This method considers both a candidate’s academic record and co-curricular accomplishments in combination with an online questionnaire with timed written and video responses. Trained alumni evaluate the responses based on key engineering qualities, such as logical thinking, communication skills, adaptability and perseverance. In 2016, we enhanced this process by increasing our number of alumni evaluators from 30 to almost 60 to include those from outside of the Greater Toronto Area (GTA), and by incorporating the results from evaluations more specifically into the admissions process.

Figure 1.1c Applications, Offers, Registrations, Selectivity and Yield of International First-Year Undergraduates, 2007 to 2016



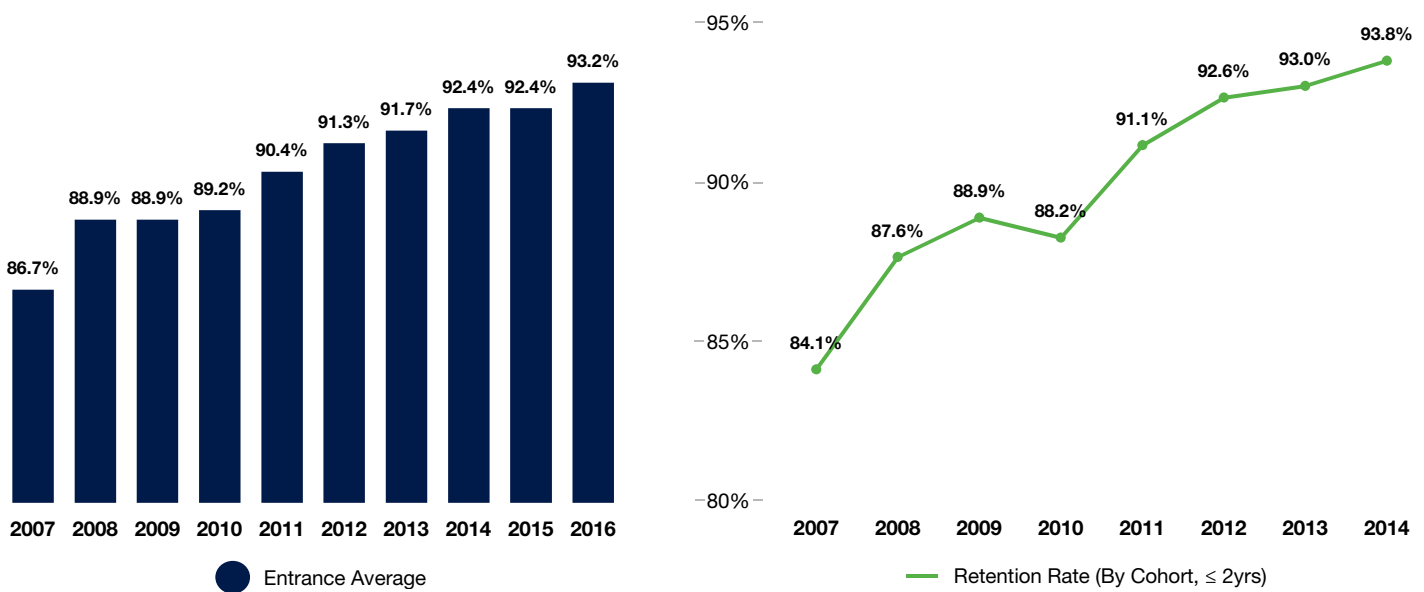
Our first-year undergraduate population was one of the most diverse in our history, which reflects our enhanced outreach and recruitment efforts and broad-based admissions process. Women comprised a record 40.1% of first-year students, the highest proportion of any engineering school in Canada.

At 27%, international students continued to account for a steady proportion of incoming students. Our ability to attract these students is enhanced by the Faculty’s International Scholar Awards, the MasterCard Foundation Scholars Program and the Lester B.

Pearson International Scholarships. (For more details, please see Chapter 9: International Initiatives and Chapter 10: Diversity.)

Our retention rate for students from first to second year increased to 93.8% (Figure 1.2), a new high, that can be attributed to our students’ academic strength and the robust programs and initiatives that we make available to support their success. (For more details, please see “Enriching the Undergraduate Engineering Experience” later in this chapter.)

Figure 1.2 Ontario Secondary School Averages of Incoming First-Year Undergraduates and Retention Rate Between First and Second Year, 2007 to 2016



To enhance our ability to attract the top students from across Canada and around the world, we augmented our recruitment activities. For the 2017 admissions cycle, key initiatives included:

- **National Recruitment** — We attended the Ontario Universities Fair at the Metro Toronto Convention Centre, where we distributed more than 12,000 viewbooks over the course of the weekend. We increased the number of school visits in the Greater Toronto Area to 70, up from 60 in 2015 and 30 in 2014. The schools were selected on the basis of historic admission data, with an eye to our enrolment priorities. We delivered a full day of U of T Engineering programming, including course sessions and engineering complex tours, at U of T's Fall Campus Day for prospective students. We also conducted fall and winter recruitment activities in Ottawa, Montreal, Vancouver, Calgary, Mississauga and Markham.
- **International Recruitment** — We conducted extensive recruitment activities in the fall and winter, including school visits, applicant events, information sessions, conference presentations and science fair participation in 12 countries. We also led a Canadian university recruitment delegation to five Latin American countries, including Colombia, Costa Rica, Ecuador, Mexico and Peru.
- **Online Events** — We hosted 19 live-streamed events, panel discussions, live chats and videos throughout

the admissions cycle to answer applicants' questions about such topics as completing an application, program showcases, PEY internships and living in residence. These events were highly successful and reached a total audience of more than 9,000 students, an increase of almost 7,000 from the previous year.

- **Young Women in Engineering Symposium (October 2016)** — The third annual YWIES attracted 53 top female Grade 12 science students from across the GTA. The event gave attendees an opportunity to learn more about engineering, participate in hands-on workshops and meet students, faculty and alumni. It also enabled us to connect with these students early in the 2016 admissions cycle. Thirty-one of the attendees applied to U of T Engineering.
- **March Break Applicant Event (March 2017)** — We hosted more than 700 applicants and their families during the invitation-only open house, which gave them an opportunity to learn more about the Faculty, specific programs, student life and our campus.
- **Engineer for a Day (March 2017)** — For this inaugural event we hosted 26 high-achieving Grade 11 math and science students from four Toronto District School Board schools that are typically underrepresented in our applicant pool, which enabled them to experience a day in the life of a U of T Engineering student.

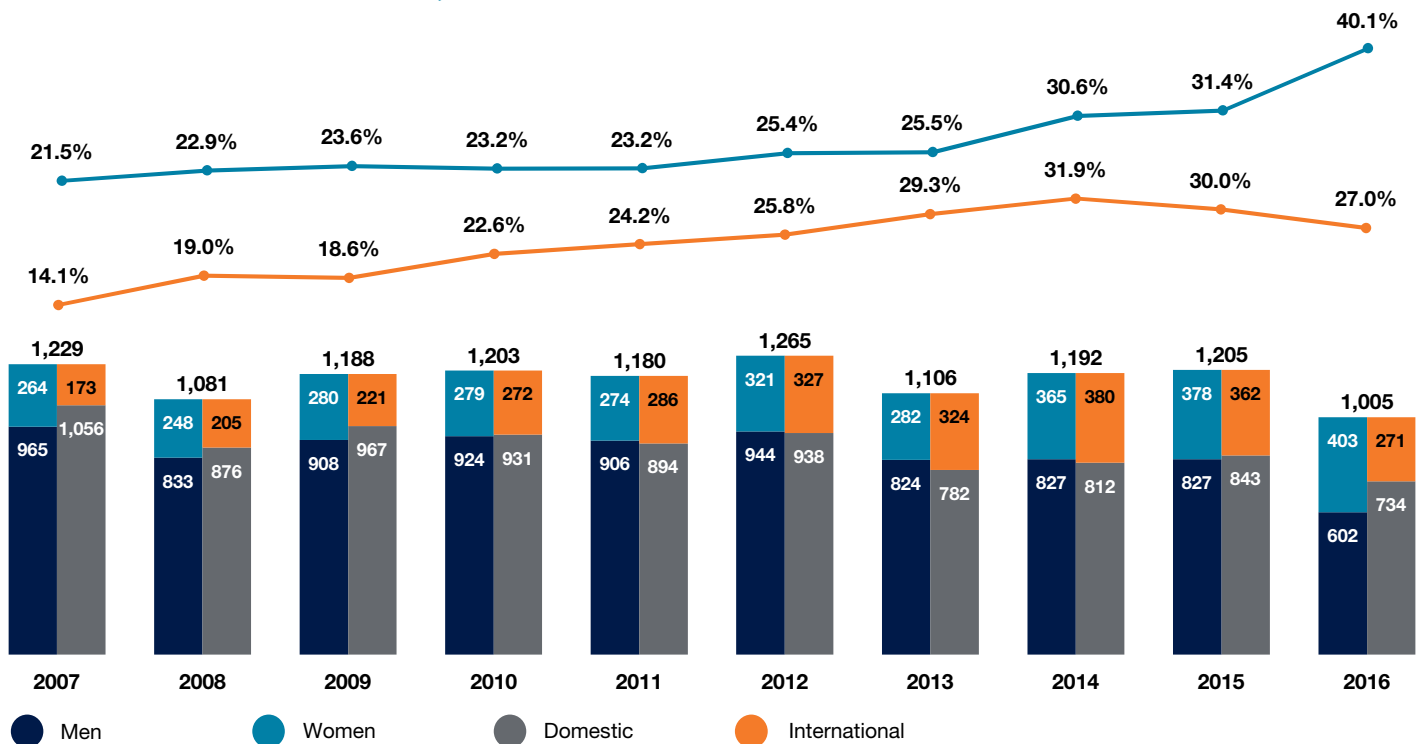
Note 1.2: Entrance average is calculated based on Ontario secondary school students. First- to second-year retention rate is indicated above year of first-year enrolment and is calculated as of November 1.

- **Admitted Student Calling Campaign (March/April 2017)** — Current U of T Engineering students called all admitted applicants from across Canada, U.S., Mexico, South America and the Caribbean to congratulate them on being accepted and answer their questions about our programs, with a focus on student experience.
- **Alumnae Calling Campaign (March/April 2017)** — This campaign connected more than 100 admitted female students across Canada and the U.S. with U of T Engineering alumnae who live in their regions.
- **Customized Individual Advising for International Students (March/April 2017)** — More than 700 admitted international applicants received personalized academic advising via Skype.
- **Girls' Leadership in Engineering Experience (GLEE) (May 2017)** — This annual, weekend-long program inspires and empowers women who have received offers of admission to our programs by connecting them with female faculty members, students and alumnae. Ninety-nine of the 115 students participating in GLEE accepted our offers of admission.
- **Welcome to Engineering (May 2017)** — This full-day event gave admitted students an opportunity to learn more about U of T Engineering before their final deadline

to accept offers from Ontario universities. More than 300 admitted students attended this event.

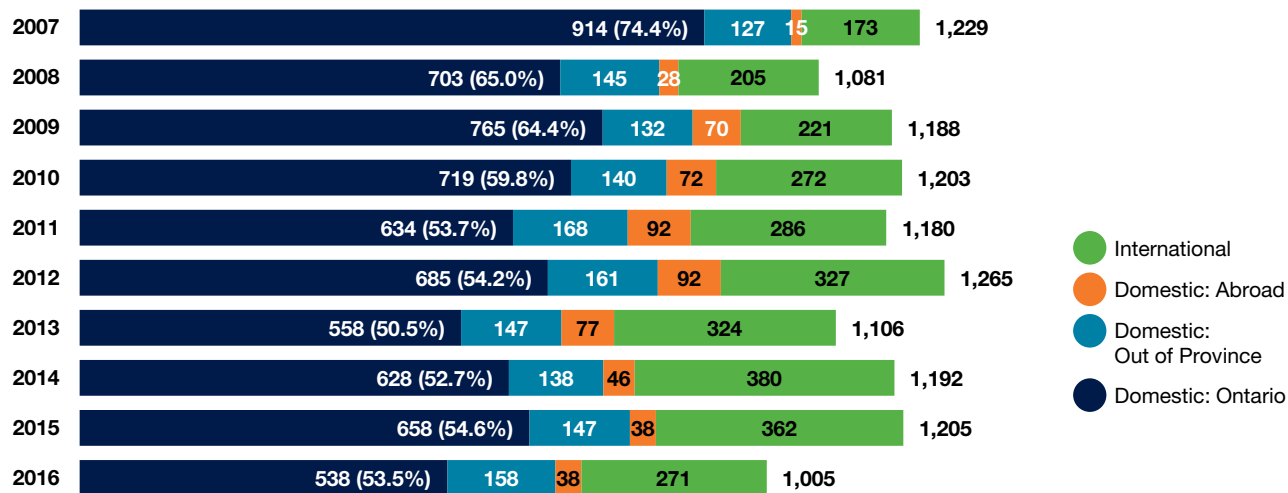
The Faculty is working with U of T's First Nations House and with Indigenous peoples and communities to increase the number of Indigenous students who apply to and enrol in U of T Engineering programs, and to ensure a welcoming, supportive and inclusive environment for students, faculty and staff. In winter 2017, U of T Engineering established the Eagles' Longhouse: Engineering Indigenous Initiatives Steering Committee, with members from across the Faculty and the Oneida Nation. The steering committee has a mandate to engage Indigenous representatives and engineering educators to design a *Blueprint for Action* to effect immediate and ongoing improvements in the relationship between the Faculty and Indigenous communities, including facilitating greater integration of existing outreach, recruitment and retention initiatives, both within the Faculty and across the University, that affect Indigenous engineering students. (For more information, see Chapter 10: Diversity.)

Figure 1.3 Incoming First-Year Undergraduates with Percentage of Women and International Students, 2007 to 2016



Note 1.3: Student counts are shown as of November. 1. Domestic students are defined as citizens or permanent residents of Canada.

Figure 1.4 Incoming First-Year Domestic and International Undergraduates, 2007 to 2016

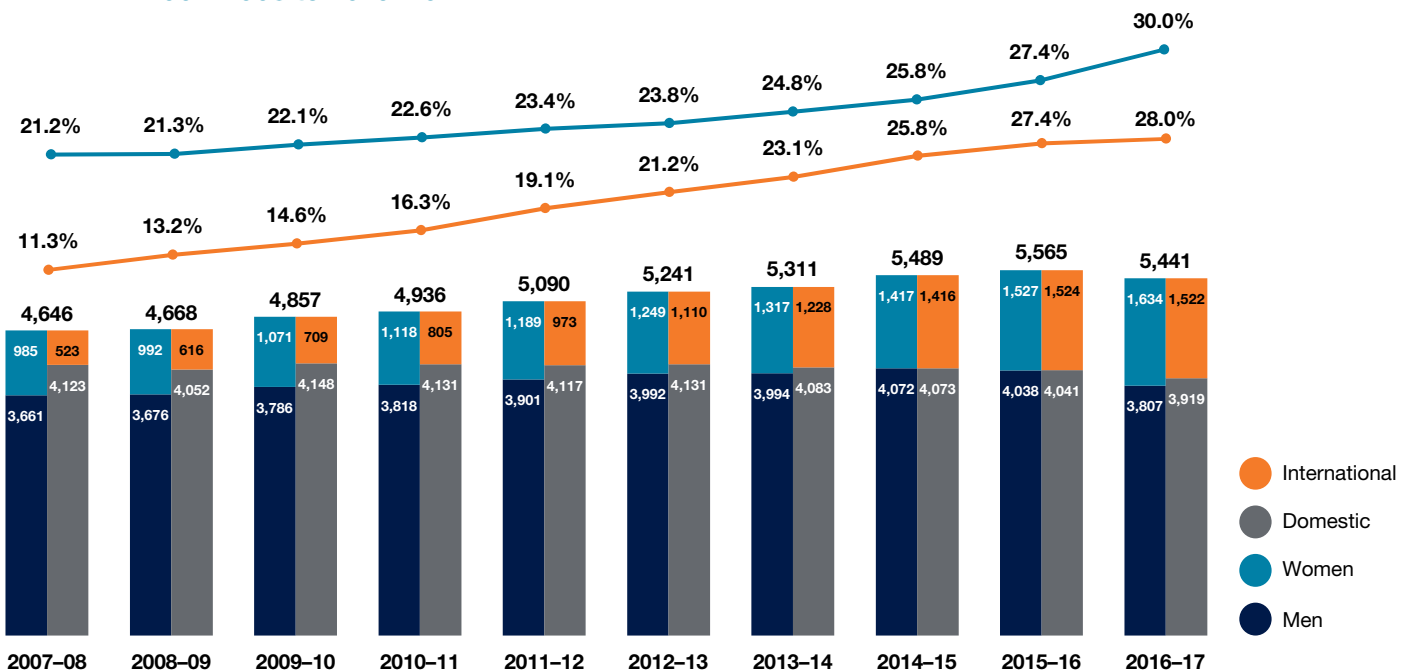


Enrolment

In 2016, enrolment by women increased across all programs and our overall female undergraduate population reached 30.0%, up from 27.4% in 2015–2016. This growth is expected to continue as the number of women students in our entering class increases year over year.

Our international student population continued to grow and enrich our global U of T Engineering community with diverse perspectives. International students now comprise 28.0% of all undergraduates, up from 11.3% in 2007–2008.

Figure 1.5a Undergraduate Enrolment with Proportion of Women and International Students, 2007–2008 to 2016–2017



Note 1.4: Student counts are shown as of November 1. Domestic students are defined as citizens or permanent residents of Canada.

Note 1.5a: Includes full- and part-time students and those on Professional Experience Year (PEY) internships. Does not count students with special (non-degree) status. Student counts shown as of November 1. Domestic students are defined as citizens or permanent residents of Canada.

Figure 1.5b Women as a Proportion of Total Enrolment by Program, 2007–2008 to 2016–2017

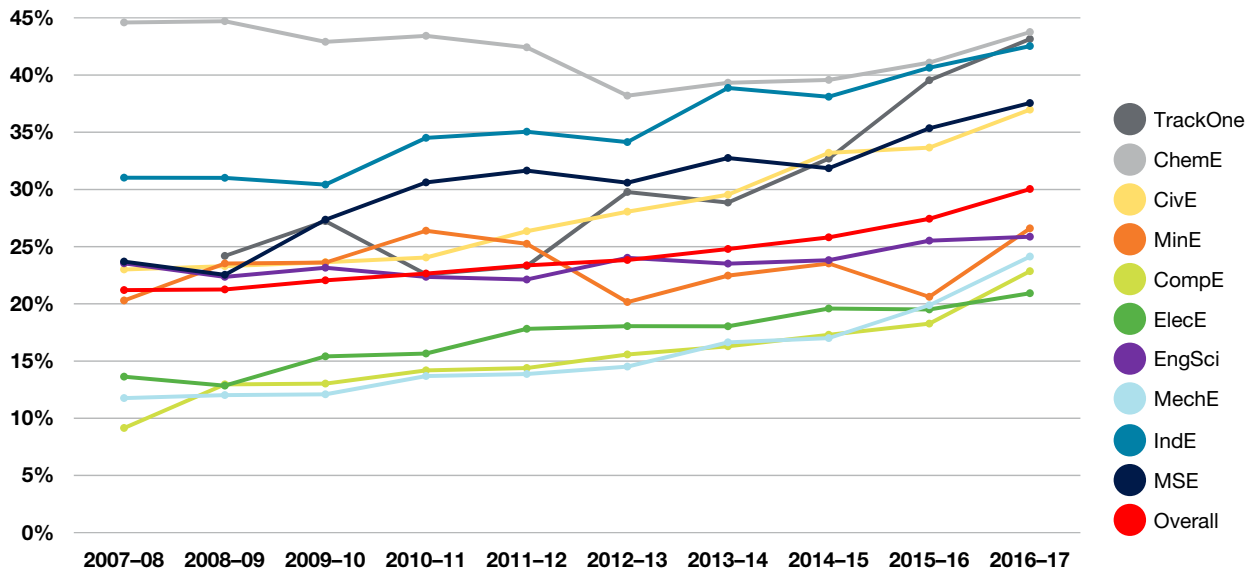
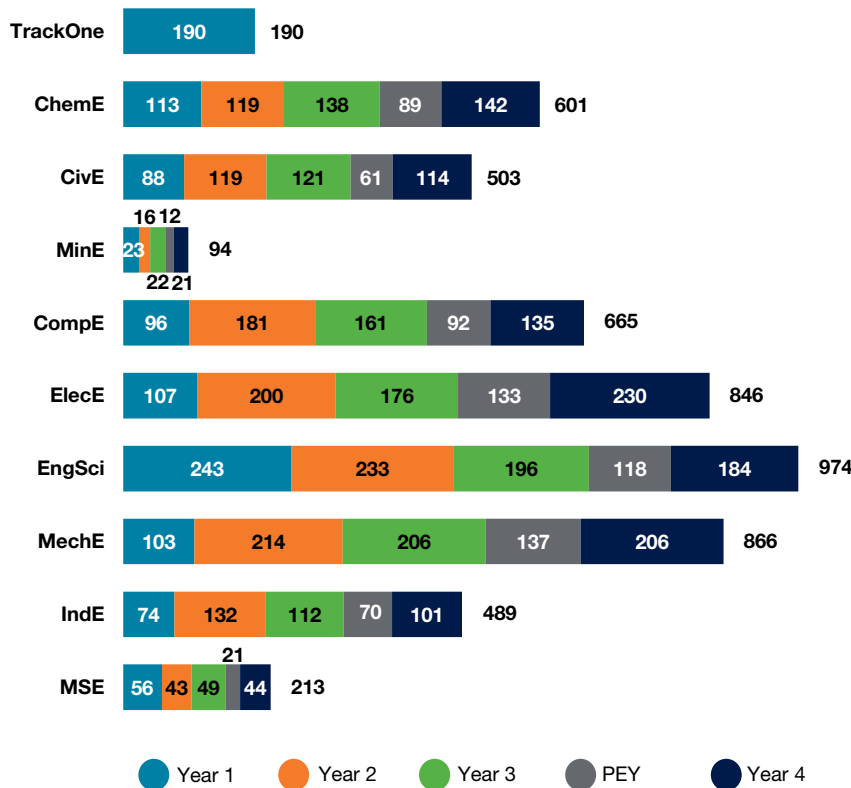


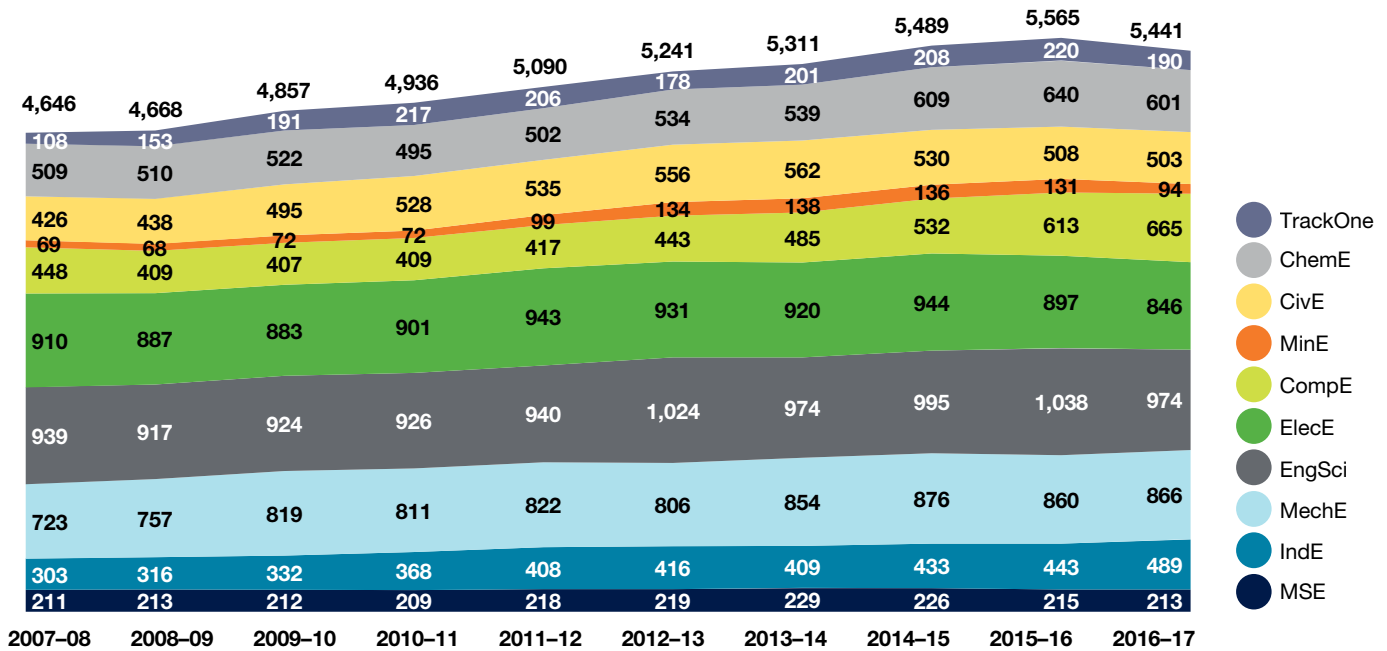
Figure 1.6 Undergraduates by Program, Year of Study and Professional Experience Year (PEY), 2016–2017



Engineering Science Majors	Enrolment
Aerospace Engineering	57
Biomedical Systems Engineering	48
Electrical and Computer Engineering	85
Energy Systems Engineering	34
Infrastructure Engineering	14
Mathematics, Statistics and Finance	43
Nanoengineering	2
Engineering Physics	29
Robotics Engineering	68
Total	380

Note 1.6: Student counts are shown as of November 1. Engineering Science Majors show only students in Year 3 and Year 4 and do not count students on PEY internships.

Figure 1.7 Undergraduates by Program, 2007–2008 to 2016–2017



Note 1.7: Student counts are shown as of November 1.

Need-Based Funding

We ensure that all students are able to enrol in our degree programs and complete their course of study regardless of financial means. We provide funding for undergraduate students through a variety of sources, including individual donors and the University of Toronto Advanced Planning for Students (UTAPS) program.

The number of undergraduate students receiving need-based awards in 2016–2017 was 1,518. The total amount of student support was \$10.1 million. This funding is distributed relatively evenly across all four years of study.

The amounts shown in this chapter do not include merit-based scholarships or awards, or funding from provincial assistance programs such as the Ontario Student Assistance Program (OSAP).

Figure 1.8a Number of Awards Received by Cohort with Total Number of Undergraduate Need-Based Award Recipients, 2009–2010 to 2016–2017

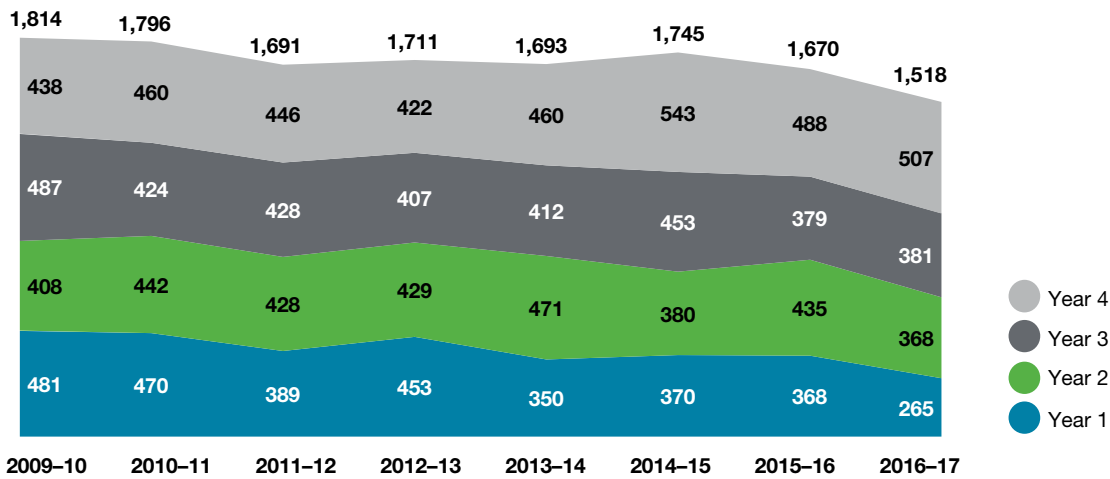
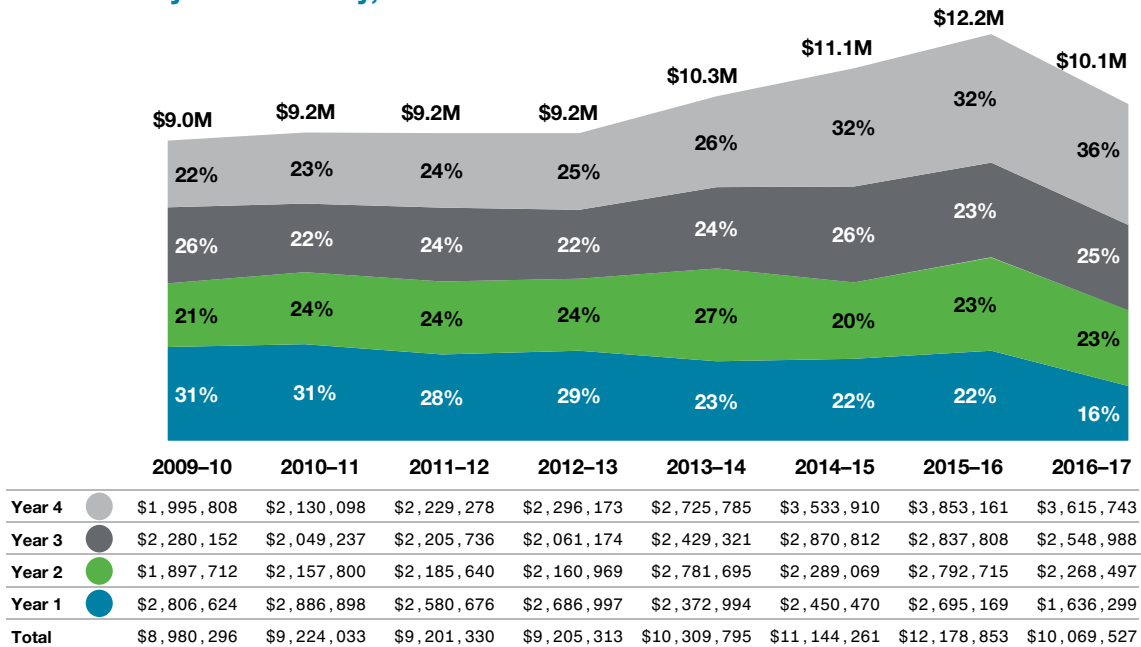


Figure 1.8b Total Value of Undergraduate Financial Assistance and Percentage Distributed by Year of Study, 2009–2010 to 2016–2017



Note 1.8a, b: Data for these figures were obtained from the new Student Accounts Reporting Cube. In previous Annual Reports, data were obtained from the Faculty Registrar's Office. For more information, see Data Sources.

Degrees Awarded

U of T Engineering students earn either a Bachelor of Applied Science (BASc) or Bachelor of Applied Science in Engineering Science (BASc EngSci). Both degrees can be completed in four years. However, many of our second- and third-year students choose to complement

their degrees with a 12- to 16-month PEY internship, which adds 12 months to their time-to-completion. *(For more information on PEY, please refer to Chapter 4: Cross-Faculty Education and Experiential Learning.)*

Figure 1.9a Undergraduate Degrees Awarded by Program, 2007–2008 to 2016–2017

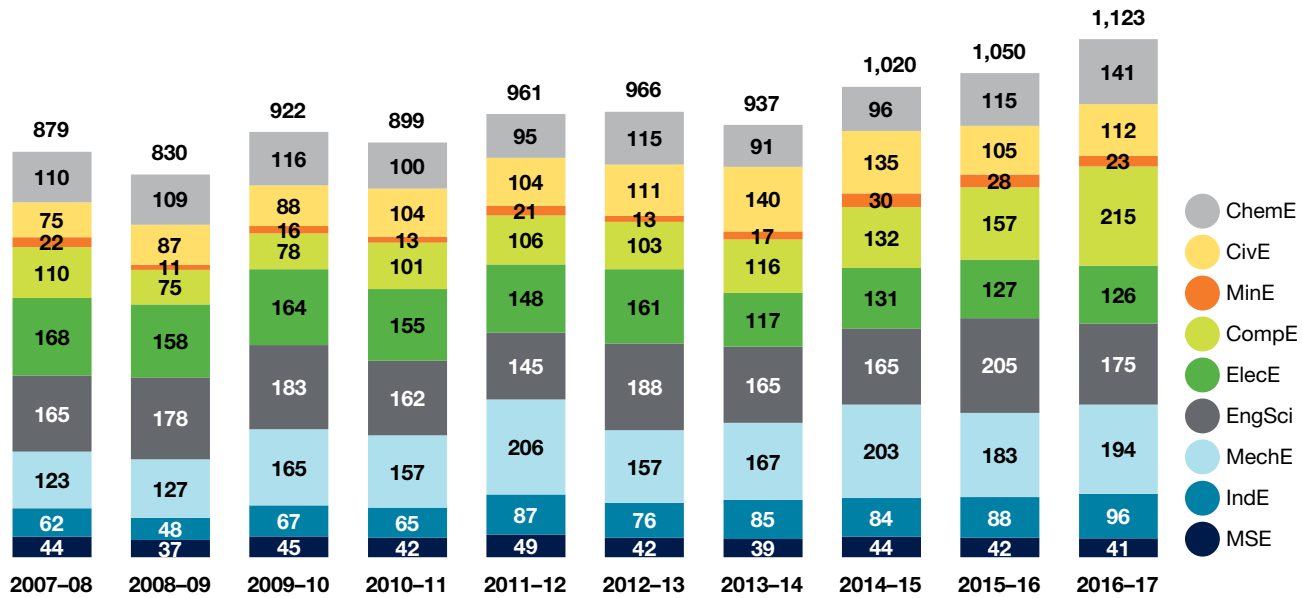
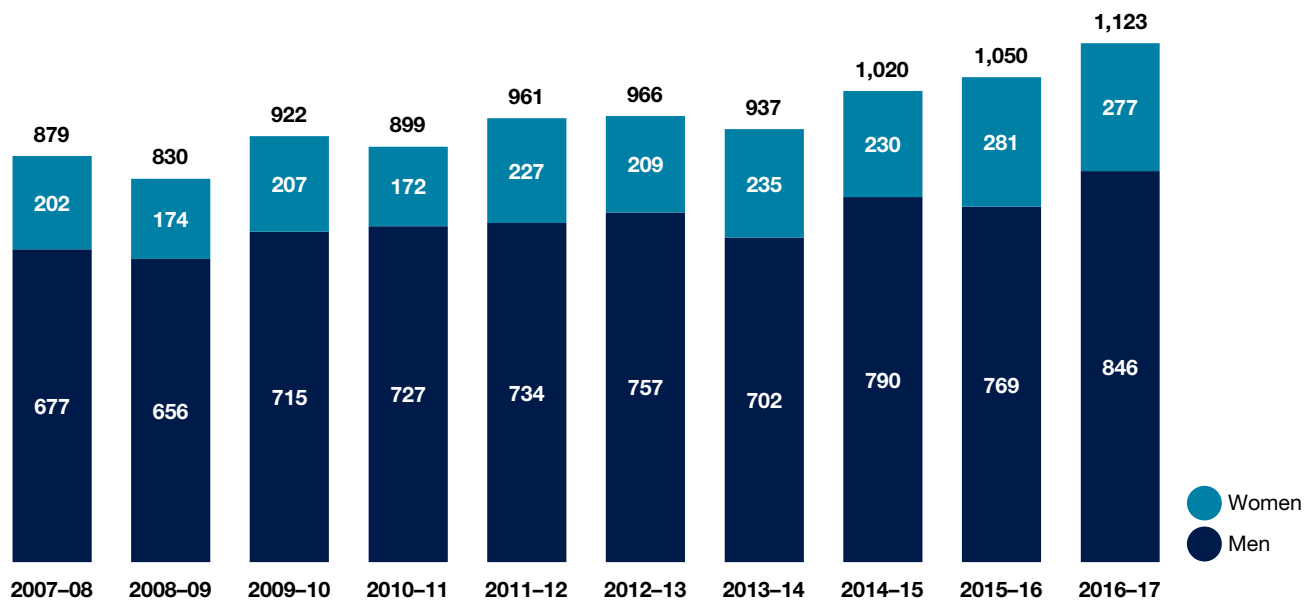
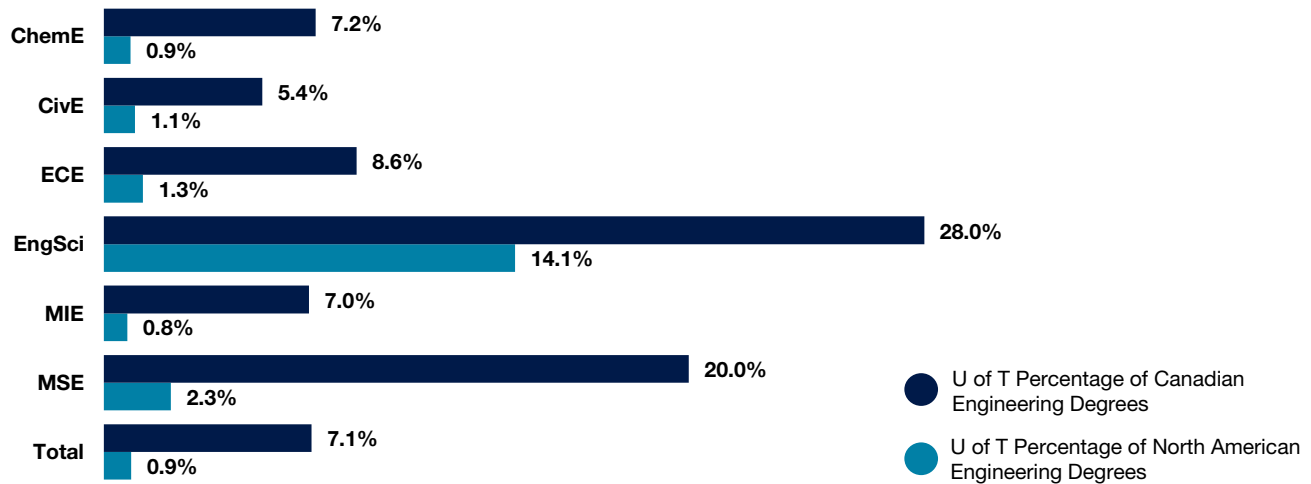


Figure 1.9b Undergraduate Degrees Awarded by Gender, 2007–2008 to 2016–2017



Note 1.9a, b: Data reported by academic year (September to August).

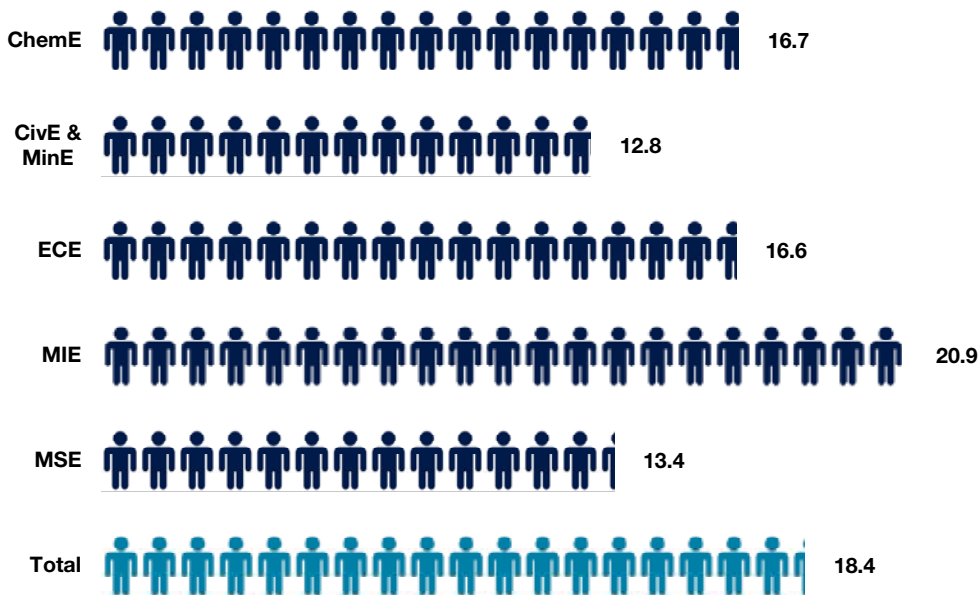
Figure 1.9c U of T Engineering Degrees Awarded by Academic Area Compared with Canadian and North American Degree Totals, 2015



Student-to-Faculty Ratios

Figure 1.10 shows the number of undergraduates relative to the number of faculty in each department. Students in programs that employ a cross-faculty teaching approach, such as Engineering Science and TrackOne, are included only in the “Total” bar. The overall student-to-faculty ratio has decreased to 18.4 from the previous year’s value of 19.0 as a result of the addition of 14 new faculty members.

Figure 1.10 Undergraduate Students per Faculty Member by Academic Area, 2016–2017



Note 1.9c: Data sourced from reports produced by Engineers Canada and the American Society for Engineering Education. Total percentages represent all engineering degrees in North America, including those in fields that are not specifically identified at U of T.

Note 1.10: Student and faculty counts are shown as of November 1. For full-time equivalency (FTE), each part-time student is counted as 0.3 FTE. Students with special (non-degree) status or on PEY internships are not included. Faculty counts include tenure-stream and teaching-stream faculty.

Dean's Honour List

In 2017, 41.6% of graduating students achieved Honours or High Honours (Figure 1.11a). To graduate with Honours, a full-time student must achieve a cumulative average of higher than 79.5% across second, third and fourth years and a weighted sessional fourth-year average of 74.5% or higher. The designation of High Honours, created in June 2015, distinguishes students who obtain a cumulative average of 87.5% or higher and a weighted sessional fourth-year average of 82.5% or higher. Both designations provide a measure of the outstanding achievement of our students.

The number of students who attained Dean's Honour List standing in 2016–2017 reached its highest ever, reflecting the high calibre of our students and the many programs we offer to support students throughout all years of study.

Figure 1.11a Number of Students and Percentage of Class Graduating with Honours, 2008 to 2017

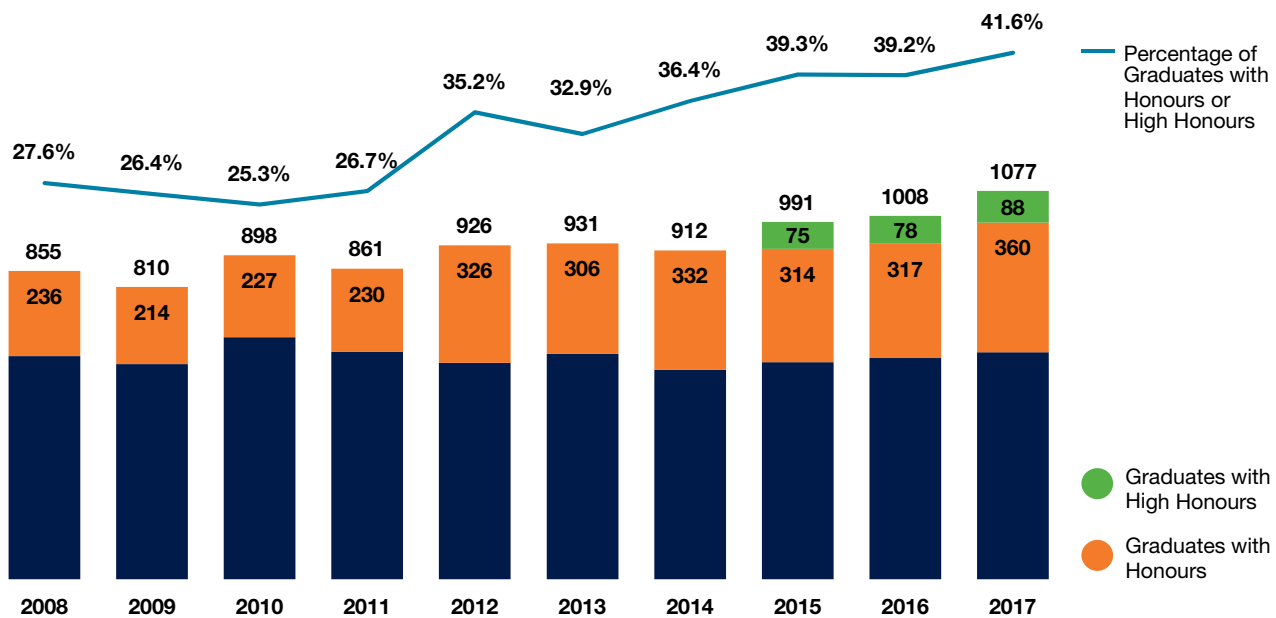
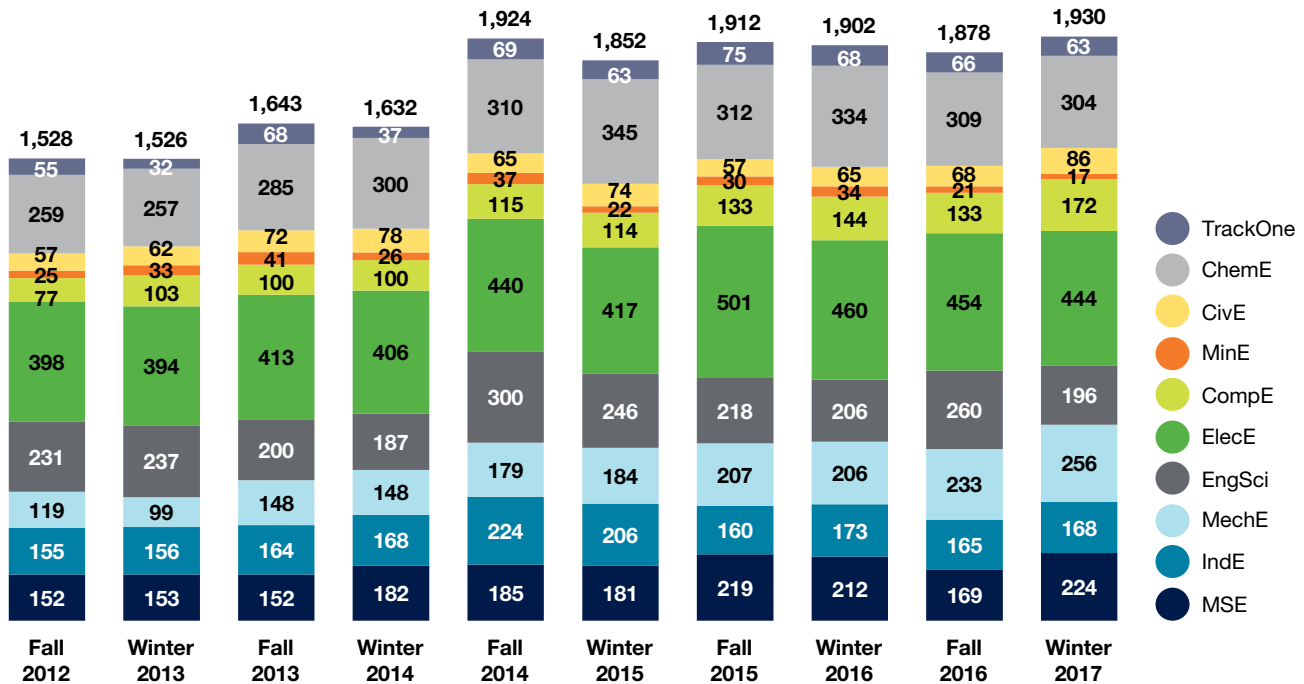


Figure 1.11b Number of Students on the Dean's Honour List by Term and Academic Area, Fall 2012 to Winter 2017



Enriching the Undergraduate Engineering Experience

We continue to strengthen our rich undergraduate programming, including innovative curricular and enhanced experiential learning opportunities, co-curricular and entrepreneurship offerings, and multidisciplinary collaborations, to ensure that our students are prepared to address the world's most pressing challenges.

In 2016–2017, we introduced 16 new undergraduate courses:

- APS110 Engineering Chemistry and Materials Science
- APS447 The Art of Ethical & Equitable Decision Making in Engineering
- BME430 Human Whole Body Mechanics
- CHE416 Chemical Engineering in Human Health
- CHE450 Bioprocess Technology & Design
- CIV401 Design and Optimization of Hydro and Wind Electric Plants
- ECE412 Analog Signal Processing
- ECE424 Microwave Circuits
- ECE430 Analog Integrated Circuits
- ECE437 VLSI Technology
- MIE311 Thermal Energy Conversion
- MIE465 Analytics in Action
- MIE519 Advanced Manufacturing Technology

- MIE523 Engineering Psychology and Human Performance
- MSE438 Introduction to Computational Materials Design
- MSE451 Advanced Physical Properties of Structural Nanomaterials

Our First-Year Summer Research Fellowship launched in summer 2016 with its first cohort of eight research fellows. The Fellowship provides \$5,000 in support to students seeking to gain research experience immediately after their first year of study. Students from all Core 8 programs, Engineering Science and TrackOne are eligible.

Enrolment in all four of our online first-year courses increased from their 2015–2016 numbers:

- APS160 Mechanics rose 11.6%
- APS162 Calculus I rose 14.6%
- APS163 Calculus II rose 65%
- APS164 Introductory Chemistry from a Materials Perspective rose 575% (inaugural cohort was four students in 2015)

In fall 2017, we will launch one new minor and one new certificate. The minor in Advanced Manufacturing will draw on the Faculty's strengths in three key areas — advanced materials, processing and logistics — to prepare

Note 1.11b: Honours standing is normally granted to students carrying a full academic load (2.5 credits per session, excluding extra courses) if the session is not being repeated. During fourth year, a student may reduce their course load in either semester (but not both) and still be eligible for Honours standing, provided the other conditions are met.

tomorrow's engineering leaders to design the products of the future, as well as the systems for fabricating their components and delivering them to customers. It will include courses that emphasize management competencies, delivered in collaboration with the Institute for Leadership Education in Engineering (ILead). Our new certificate in Forensic Engineering will enable students to find and analyse data from disasters, automobile and aircraft accidents and product failures, and to present an unbiased assessment of the underlying cause(s).

The first cohort of TEAL Fellows was named in spring 2017. This program provides support to enable 23 instructors to design or redesign courses to include active learning approaches that leverage the unique nature of the TEAL classroom environment. U of T Engineering currently has one TEAL classroom, and will add five more in the forthcoming CEIE.

For the second year, we delivered a weeklong Calculus Summer Boot Camp for entering students who want to review key foundational mathematical concepts. Enrolment for the boot camp more than doubled, from 103 students in 2015 to 207 in 2016. We also deliver an array of programs to first-year students to support their learning, including:

- **Success 101**, a three-day mini-course that is part of the First Year Foundations program, that runs three times over the summer, providing guidance on time management, effective note taking and classroom etiquette and communication;
- **T-Program**, a Transition Program that allows first-year students faced with academic challenges to redistribute their course load, defer courses to the summer session and retake up to three fall courses in the winter term;
- **Peer-assisted** study sessions delivered by upper-year students;
- **Embedded counsellors** who provide students with personalized support for learning strategies, health and well-being, and international transition;
- **Engineering Learning Strategist**, a new full-time staff member who develops academic programming and workshops to assess and enhance students' academic competencies related to task prioritization, note taking, critical thinking, problem solving, exam preparation, and coping with stress and anxiety.

(For further information about experiential learning and multidisciplinary collaboration, please see Chapter 4: Cross-Faculty Education and Experiential Learning.)

Pre-University Engineering Outreach

The Engineering Student Outreach Office designs and delivers more than a dozen programs that engage students in Grades 3 to 12 in science, technology, engineering and mathematics (STEM). The aim is to inspire pre-university students to pursue careers in science and engineering, recruit undergraduate students by giving them positive engineering educational experiences, enhance the student experience for our current undergraduate and graduate students, and foster positive relationships between the University and the community.

The U of T Engineering students who provide instruction and support for these programs serve as ambassadors for the Faculty. They gain valuable experience in youth education and project management, strengthen their leadership, team-building and communication competencies, and deepen their understanding of basic engineering principles. We also bring together elementary and secondary school teachers to share innovative ways to bring STEM into their classrooms.

Every summer, our Da Vinci Engineering Enrichment Program (DEEP) Summer Academy draws motivated high school students from around the world to weeklong courses, where they explore a variety of engineering, business and science disciplines. We also offer March Break and summer

camp, Saturday programs and in-school workshops that inspire elementary school students to explore topics ranging from aerospace engineering to coding to regenerative medicine. We are particularly proud that our programs successfully connect girls and youth from underrepresented communities — including Indigenous youth — with STEM.

In 2016–2017, we reached more than 5,000 pre-university students through our outreach programs. See Appendix B for a full list of these programs.

Highlights of our outreach programs include:

- **Go North**, Canada's largest STEM event for children in Grades 4 to 8. This one-day event, held in May 2017, was run in partnership with Google Canada and Actua, a national STEM charity. It attracted more than 1,200 students and teachers from across the GTA.
- **Engineering for Educators**, a day-long event held in November 2016 that brought together science and math teachers from across the GTA for a series of interactive and collaborative workshops on teaching and learning STEM.

(For more information on these initiatives, see Chapter 10: Diversity.)

Selected Undergraduate Highlights

First-year engineering students inspire retrofit for U of T's Fisher Rare Book Library

As part of their first-year Engineering Strategies and Practices (ESP) course, a team of six students designed a strategy to prevent rising humidity levels in U of T's Thomas Fisher Rare Book Library. When the library's insulation began to fail, causing condensation, increased humidity and a greater risk of mold, property managers, building engineers and architects recommended reinsulating the building from the inside, necessitating removing the collection and closing the library. In 2014, the library turned to students in the ESP course for other options. The team of Jennifer (Yewon) Son, Michael Lancaster (Year 3 MIE), Jackie Lunger, Toby (Yishun) Ou, Alice Wolfe (Year 3 MIE) and Tom Zhang (Year 3 EngSci) explored more than 50 ideas before settling on their final solution: installing a heated envelope and insulated external surface over the existing concrete, with a finishing layer that replicates the current appearance. Over the next two years, the concept to repair the building from the outside received approvals from the University's administration, and architectural firms were brought in to draft models and ensure the idea would work. After adjustments to the design, in November 2016 – nearly three years after the students were first assigned the project – the retrofits to the Thomas Fisher Rare Book Library began. Construction is scheduled to be complete in summer 2017.

U of T Engineering student athletes recognized for excellence

Twenty-five U of T Engineering student athletes were honoured at the seventh annual U of T Varsity Blues Academic Excellence Breakfast. Each received special pins to mark the achievement. Recipients included:

- Corrine Bertoia (CivE MASc candidate) – lacrosse
- Paige Clarke (Year 3 MinE) – mountain biking
- Lia Codrington (Year 2 EngSci) – cross country
- Caitlin Elliott (Year 3 MechE) – curling
- Keith Eriks (Year 4 MechE) – swimming
- Antonina Gorshenina (Year 3 EngSci) – tennis
- Brandon Hadfield (Year 3 EngSci) – baseball
- Matthew Hart (Year 4 MinE) – water polo

- Liam Horrigan (Year 3 MechE) – water polo
- Beston Leung (Year 2 CompE) – fencing
- Jonathan Luk (MechE 1T1, MIE MASc candidate) – mountain biking
- Alex Magnan (Year 3 CivE) – swimming
- Caitlin Maikawa (Year 4 ChemE) – ice hockey
- Nathalin Moy (Year 4 EngSci) – swimming
- Osvald Nitski (Year 2 MechE) – swimming
- Kylie O'Donnell (MASc 1T4, ChemE PhD candidate) – fast pitch softball
- Nicole Parkes (Year 3 ChemE) – soccer
- Ross Phillips (Year 4 ChemE) – swimming
- Yusuf Shalaby (Year 3 IndE) – squash
- Sever Topan (Year 4 CompE) – water polo
- David Urness (Year 4 EngSci) – rowing
- Christopher Vinelli (Year 4 IndE) – golf
- Marko Vojinovic (Year 2 IndE) – rowing
- Jacob Weber (Year 2 EngSci) – curling
- Tanner Young-Schultz (Year 3 CompE) – baseball

U of T Engineering student earns Rhodes Scholarship

Stephanie Gaglione (ChemE 1T7) was selected as a 2017 Rhodes Scholar, a prestigious annual scholarship to the University of Oxford. She plans to use the scholarship to continue postgraduate study in biomedical engineering, and hopes one day to advance biomaterial platforms for vaccines and drug delivery. Last year, she received a Fulbright Canada undergraduate scholarship and spent 10 months studying at in the lab of Professor Robert Langer at the Massachusetts Institute of Technology, where her work focused on drug delivery to cells in the immune system.

U of T Engineering welcomes two new Schulich Leaders

James Xu and Kevin Han (both Year 1 EngSci) were named 2016 recipients of the Schulich Leader Scholarship. Established in 2012 by businessman Seymour Schulich, the Schulich Leader Scholarships were created to foster the next generation of global pioneers in science, technology, engineering and mathematics (STEM).