



UNIVERSITY OF TORONTO
FACULTY OF APPLIED SCIENCE & ENGINEERING

Academic Plan 2011-2016

Year Three: Progress and Achievements

Cristina Amon, Dean

Faculty of Applied Science & Engineering
University of Toronto
October 2014

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1. Executive Summary

This year, U of T Engineering reached the midpoint of our 2011–16 Academic Plan – a vibrant, living document that guides our Faculty’s strategic activities. To assess and demonstrate our progress in achieving and exceeding our ambitious goals, we are pleased to present our Year Three progress report.

Through actively fostering a culture of excellence, our Engineering Faculty continues to be the leader among Canadian peers. We garnered 21.3 per cent of all major faculty awards in the country over the last year, and have been named Canada’s premier engineering school in every international ranking.

Enhancing the student experience has been our ongoing priority, and our innovative initiatives attract students of the highest calibre from across Canada and around the world. Applications to undergraduate programs grew by 10 per cent this year, and the Ontario high school average for our first year class is now at 92.3 per cent. Recognizing that brilliance is demonstrated by more than just grades, we are launching a more broad-based admissions approach that will include interviews with the applicants in addition to marks, extra-curricular activities and essays.

We surpassed our goal of 2,000 graduate students by 2015 two years early, and we are well on our way to balancing the undergraduate to graduate student ratio to 60:40. Internationally, we have attracted top exchange students from around the world including over 300 Brazilian students through the Science without Borders (SwB) program, and we have met our goal of 25 per cent international undergraduate enrolment. Having reached that target, we are now enhancing our regional recruiting efforts to achieve even greater diversity among our student body.

Our Faculty continues to be a leader in advancing the use of learning technology. In the past year, we developed a new Technology Enhanced Active Learning (TEAL) pilot classroom, and additional online and inverted classroom courses. We have added a new undergraduate minor and two new undergraduate certificates, and launched Canada’s first collaborative Engineering Education program for master and PhD students. We also appointed a task force to review and make recommendations to improve the first year curriculum.

In addition to enhancing the educational experience, supporting multidisciplinary and collaborative research is a key component of our Academic Plan. This year we established two new EDU:Cs – the University of Toronto Transportation Research Institute (UTTRI) and the Toronto Institute of Advanced Manufacturing (TIAM). We also achieved \$26.3 million per year in Tri-Council annual funding, surpassing our Academic Plan goal of \$25 million by 2015. We have now established a new goal of \$32-million in Tri-Council funding by 2015-16.

In 2013-14, the Faculty experienced our most successful fundraising year of the Boundless Campaign. Alumni, students and friends from around the world rallied behind our vision for excellence in engineering research, education and innovation, which includes our forthcoming Centre for Engineering Innovation & Entrepreneurship (CEIE). We raised \$22 million last year, which combined with funds raised at earlier stages of the campaign, brings us more than halfway to our \$200-million Engineering Campaign goal. Our success is a signal that our work is delivering value and promise. We are educating the brightest new engineers and making transformative innovations that are impacting our world. We will continue to pursue new relationships, industry partnerships and collaborations with external stakeholders to further enhance our impact.

We invite you to read more about our progress and achievements in the following report. These past three years have laid the foundation upon which we will build our future, and that future looks very bright.

2. Culture of Excellence

It is our pursuit of excellence that drives us each day to achieve, impact, and innovate. It is the goal of U of T Engineering to lead among the very best schools in the world. We measure our progress toward this goal in a number of ways.

Awards and Honours

Our Faculty continues to be the leader among Canadian peers in awards and honours, while making steady progress in increasing our nominations of junior faculty for early career awards. In 2013-14, we garnered 21.3 per cent of all major awards received by Canadian Engineering Faculties with only 5.9 per cent of the overall faculty members in Canada. Our early career professors and alumni also won a remarkable number of major emerging leader awards including:

- The McLean Award
- The Engineers Canada Young Engineer Achievement Award
- The Professional Engineers Ontario Young Engineers Medal
- and one Steacie Fellowship

In addition, our professors received more than 20 major awards and fellowships from national and international professional societies, including six Canadian Academy of Engineering Fellows, three Engineering Institute of Canada Fellows, the PEO gold medal, and the Engineers Canada gold medal. One of Canada's most prestigious scholarly awards, the Killam Prize, was also awarded in recognition of outstanding career achievement for work in new laser applications. In 2014, the University of Toronto also honoured our Faculty with three Inventor of the Year awards, the U of T Faculty Award, a Distinguished Professorship, and a University Professorship.

U of T Engineering is also exceedingly proud of the awards received in recognition of our outstanding educational achievements, such as the Alan Blizzard Award for an exemplary collaborative educational endeavour (presented by the Society for Teaching and Learning in Higher Education), and the Sharon Keillor Award for Women in Engineering Education and Donald E. Marlowe Award for Distinguished Education Administration, both from the American Society for Engineering Education.

Alumni Achievements

This pursuit of excellence inspires our students long after they graduate. One only has to glance through recent headlines to see the tremendous achievements of our alumni. Whether it be the first-ever sustained flight of a human-powered helicopter (AeroVelo), the world's most efficient light bulb (Nanoleaf), or biometric authentication solution (Bionym – which recently raised \$14-million in venture capital funds), U of T Engineering continues to have a profound impact on the world through our talented and entrepreneurial graduates.

Diversity in Faculty and Student Recruitment

Our reputation for excellence is a key driver in attracting world-class students and faculty. Our objectives to grow opportunities for interdisciplinary and collaborative research were recently bolstered with the recruitment of three excellent female professors, each of whom is cross appointed to two departments. The proportion of international and female students relative to our total enrollment numbers continue to grow. More than 35 per cent of the first year class is comprised of international students, and 30 per cent of the total first year class is female.

The strategic efforts to recruit women to careers in Engineering begins at an early age through the Faculty's pre-university outreach efforts. We created and deliver a number of programs targeted at girls from school age through high school to interest them in Science, Technology, Engineering and Math (STEM). Our recruitment office continues these efforts through special initiatives. For the third year in a row we have hosted GLEE (Girls' Leadership in Engineering Experience), which empowers and inspires female engineering applicants – most of whom later accept their admission to U of T – by connecting them with women faculty, students and alumni. New this year was a March Break Open House event specifically targeted to the recruitment of female students.

Curriculum Innovation

We recognize that we cannot rest on our laurels as the top ranked engineering school in Canada and among the very best in the world. We must always lead, assess, and improve. To that end, we appointed a task force to review our first year curriculum, which had last been reviewed a decade before. The task force not only met with constituents to gather input at Faculty Council, town halls, and departmental meetings, but also looked at peer institutions and relevant literature. Feedback was synthesized into a number of recommendations that were discussed with Chairs and Directors in May 2014. Implementation will continue through 2014-15 and focus on areas such as improved first year teaching and course delivery, in-depth mathematics and science curriculum reviews, integration between courses, and transition to the University learning experience.

Additionally, we continue to measure our progress within departments through cyclical external reviews. This past year the Department of Materials Science & Engineering, the Edward S. Rogers Sr. Department of Electrical and Computer Engineering, the Department of Mechanical & Industrial Engineering, and the Engineering Communication Program (ECP) underwent reviews. These resulted in reflective self-studies, thoughtful recommendations and praise for the excellent quality of our educational programs, research, faculty and students. In tandem with these reviews, we conducted Chair searches in these departments and a Director search for the ECP. All three department Chairs were reappointed for five-year terms and a new Director was appointed to the ECP as of July 1, 2014.

2. CULTURE OF EXCELLENCE: YEAR 3 PROGRESS HIGHLIGHTS

2.1 Maintain a strong Faculty vision for excellence in engineering education and research.

- Maintained our position as the premier Canadian engineering institution in all international rankings
- Garnered 21.3 per cent of all major awards received by Canadian engineering Faculties with only 5.9 per cent of overall faculty members in Canada

2.2 Measure our progress in achieving our mission and vision.

- Assessed our progress through key metrics and published our 6th Annual Report of Performance Indicators
- Reviewed our actions towards achieving our Academic Plan goals and published our Year 3 Progress Report

2.3 Increase diversity, focusing on gender diversity among students and faculty.

- Attracted 4 new faculty members, 3 of which are women, in 2013-14
- Percentage of women academic staff rose slightly to 16.9 in 2013-14
- Achieved an impressive gender mix among undergraduate students: first year female students now comprise approximately one-third of the class; overall, one quarter of the undergraduate student body is female; similarly, international students also make up one-third of the first year class and one quarter of the undergraduate student body as a whole
- Increased the profile of female faculty members and students through nominations for awards and honours

2.4 Support the development of faculty members as outstanding engineering educators and researchers.

- Established a peer review or mentorship program in each department to support and guide faculty members in the development of their NSERC Discovery Grant (DG), Discovery Accelerator Supplements (DAS), and Research Tools and Instruments (RTI) grant applications
- Won a remarkable number of major emerging leader awards by early career professors and alumni, including the McLean Award, Engineers Canada Young Engineer Achievement Award, Professional Engineers Ontario Young Engineers Medal, and a Steacie Fellowship
- Continued offering the lunch time panel series: Best practices in research for faculty members and researchers
- Held second annual First Year Instructors Day
- Ran workshops on developing learning outcomes through the Teaching Methods and Resources Committee

2.5 Support our students by strategic efforts to build upon educational, extracurricular and co-curricular experiences.

- Experienced a 5% increase in participation in summer research abroad
- Participated for the second year in the Globex program with Peking University; 5 MIE students took part in an intensive four-week summer program in 2014
- Reached a historic high of 723 engineering students placed by PEY in 2014
- Established an undergraduate Certificate in Engineering Leadership
- Launched a graduate collaborative program (MAsc and PhD) in Engineering Education in partnership with OISE

2.6 Maximize the skills of our staff members and create opportunities to strengthen their performance and develop them as integral contributors to the Faculty's mission.

- Recognized the successes and contributions of staff through Faculty awards
- Through the newly established Human Resources office, engaged in discussions with business officers and Chairs and Directors to assess needs and priorities in this area
- Encouraged secondments throughout the Faculty, as appropriate, to enable development of new skills

2.7 Increase staff retention and enhance succession planning within the Faculty.

- Established a working group of business officers and human resources staff who meet regularly to share information and best practices
- Increased HR service delivery and resources for staff

2.8 Build upon alumni involvement with the Faculty to share their world-based expertise and perspectives, to strengthen our reputation and to inspire the next generation of U of T engineers towards innovation and excellence.

- Added recruitment and new student welcome receptions to alumni events abroad
- Created mentorship and sponsorship opportunities for alumni through the Entrepreneurship Hatchery; 59 mentors participated in 2014
- Hosted 61 alumni events with nearly a dozen taking place outside of Canada
- Proactively participated in events such as the U of T Arbor Awards
- Organized a successful Spring Reunion
- Engaged alumni through volunteer roles on advisory boards and the mentorship program

2.9 Enhance governance processes, cyclical reviews and quality assurance processes.

- Utilized the UTQAP review process at the local level by initiating a Decanal review of the Engineering Communication Program (ECP)
- Commissioned the first external review at the Decanal level of an EDU:C – the Institute for Leadership Education in Engineering (ILead) – to assess the quality of educational offerings
- Initiated regular reviews of all EDU:Cs and EDU:Ds by the Faculty Research Committee

3. Positioning

At U of T Engineering our vision is to continue to be a leader among the world's very best engineering schools in our discovery, creation and transfer of knowledge and technology through teaching and research. This vision guides our decisions and actions as we accomplish the objectives set out in our 2011-16 Academic Plan.

We consistently place first among engineering school in Canada, by a significant margin, in all international rankings. While rankings are only one of many measures of our excellence, they serve to enhance our international profile and strengthen our global reputation. This is evident in the growing number of international students, both undergraduate and graduate, who apply to our prestigious programs.

The impact and span of our research, paired with the diversity of our activities and community, offers a wealth of stories to tell. We continue to employ a variety of communication vehicles to showcase our leaders at the forefront of innovation. In the past year, we gained the most attention from online news outlets, followed closely by radio, websites/blogs, television, and print newspapers. Local media coverage helped to raise the profile and awareness of several key Faculty initiatives:

- ILead: TTC CEO Andy Byford spoke to students at the Faculty (*Toronto Star*)
- Entrepreneurship Hatchery: *Reddit* co-founder Alexis Ohanian shared his advice with budding entrepreneurs (*Toronto Star*)
- Research and Innovation: Professor Yu Sun's (MIE) groundbreaking research on robotic in-vitro fertilization gained national coverage in the *Globe and Mail*

We are also gaining traction in our international coverage; nearly half of the 9,000 stories published were generated by media outlets outside of Canada. A selection of stories that gained international attention include:

- smart traffic lights invented by several U of T civil engineers,
- invisibility cloak device developed by two ECE researchers, and
- the first sustained flight of a human powered helicopter achieved by two U of T Engineering alumni.

Keeping faculty, staff, students, and alumni engaged in establishing our priorities, activities, and future plans is instrumental in fostering a culture of engagement and pride. Our three newsletters and topical town halls were designed with these audiences in mind. They endeavor to open dialogue and are returning positive results - specifically with faculty. The most recent COACHE survey showed that 71.5 per cent of tenure-stream faculty members surveyed are satisfied by the communication of priorities by the Dean. This is significantly higher than the University as a whole (which stands at 42.9 per cent) and speaks to the power of consultation and information sharing.

Transparency in Faculty communications is epitomized in our Annual Report of Performance Indicators, now in its sixth edition. The Annual Report measures our progress over the past 10 years in key areas and highlights major activities from the past year. While the Annual Report of Performance Indicators primarily serves an internal audience, its companion document - the External Annual Report –serves our alumni, prospective donors, and industry partners. The external annual report distills the more comprehensive information found in our performance indicators report and provides a snapshot of the Faculty’s progress and success in the areas of education, research, awards, finances, philanthropy, and provides updates on the progress of the Centre for Engineering Innovation and Entrepreneurship (CEIE). We published the first edition of this report in 2013, with plans to publish the next edition in spring 2015.

Raising awareness among prospective and existing industry partners on the diverse range of impactful research and opportunities for collaboration is fundamental to our ongoing success. To facilitate this, we created a flexible corporate brochure that highlights our areas of strength. Departmental and research specific inserts allow us to customize each brochure to meet the needs of the various audiences.

Building on the success of last year’s *Discover Engineering* hybrid viewbook, we have implemented a similar strategy in creating the *Guide to First Year*. This streamlined print publication provides key information to help students navigate their first year, while directing them to various areas of our website for more information. This new searchable site also enables our First Year office to provide the most up-to-date information to incoming students. This strategy has been incredibly successful: we received over 1,900 unique page views on the guide’s landing page within one month of the mail out, from an incoming class of just over 1,000.

As the appetite for mobile content continues to grow, the Faculty is keeping pace. We are migrating content and redesigning Faculty-level microsites to a mobile and tablet friendly platform (WordPress). These sites now meet all accessibility standards and allow users to easily share information on social media. Implementing the new WordPress platform has also enabled us to respond quickly when new research centres, such as the University of Toronto Transportation Research Institute, require an online strategic web presence. We have taken initial steps toward moving our main Faculty website to this new platform. The planning phase was completed this year and we are now building the architecture and designing the wire framing for this important project.

Our social media presence is also growing. Using Twitter, Flickr, Facebook and YouTube, we are showcasing the amazing talents of our students and faculty. Videos such as “the Jedi Wars Flying Robotics Competition,” have proven to be excellent promotional tools. The Jedi Wars video has received more than 1,400 views since April 2014. Flickr has seen equally impressive results: within four days of posting our convocation photos on Flickr, we received over 70,000 hits, up dramatically from the 5,000 hits received the previous year.

As we move forward in positioning ourselves among the very best engineering schools, we will build on the work to redesign the main Faculty website with particular focus on improved navigation, content, and marketing. Our anticipated launch is spring 2015. In tandem, we will also redesign and migrate our undergraduate website. We will also continue to strengthen our

media relations strategy by developing and promoting stories that showcase our innovative educational programs and outstanding research, and by aligning those stories with the core themes identified by our Faculty and the University.

3. POSITIONING: YEAR 3 PROGRESS HIGHLIGHTS

3.1 Deliver a plan that articulates our communication goals, maintains consistency of our branding and products, keeps on top of markets, and clearly outlines methods so that we can remain competitive and set the Faculty apart.

- Completed in early 2013; to be updated as appropriate by new Executive Director, Communications

3.2 Strengthen the Faculty's key messages and customize them for target audiences.

- Assessed metrics in key areas and published our 6th internal Annual Report of Performance Indicators
- Created a themed issue of our *Skulematters* alumni magazine highlighting entrepreneurship and commercialization
- Developed a corporate brochure that highlights our key research strengths and the benefits of partnering with U of T Engineering; it can be tailored to target specific audiences with customized inserts that feature specific departments or research areas
- Reviewed faculty and staff newsletter statistics and developed plan to improve content delivery for maximum impact

3.3 Establish the Faculty as the go-to resource for media looking for comments and engineering expertise on breaking news issues.

- Re-launched Engineering news site on new platform, incorporated revised search engine optimization strategy which resulted in significantly increased pick up by google news
- Increased public exposure received from media outlets in Canada and around the world
 - Nearly three quarters of coverage appeared in online news outlets, blogs and other websites
 - Approximately half of all stories were published by outlets outside of Canada, indicating a strong interest from international media
- Made news headlines throughout 2013–14 on several innovations and breakthroughs, including:
 - *Smarter traffic lights win global recognition for U of T grad*
 - *An invisibility cloak that actually works*
 - *U of T Engineering grads make aeronautical history with Sikorsky Prize*
 - *"Asia's richest philanthropist," major Silicon Valley firm invests in alumni's Nanoleaf light bulb*
 - *U of T Engineering Grads Invent World's Most Energy-efficient Light Bulb*
 - *Iron brew: Canadian wins grant to develop fortified tea to help save lives*
 - *New algorithm finds you, even in untagged photos*
- Leveraged a growing contributor media model: disseminated U of T Engineering-drafted stories through mainstream and niche media channels (such as Huffington Post), we shared our story on the national James Dyson Award winners, Phys.Org posted our story on a research advance in the field of turbulence

3.4 Continue to increase the quality of our storytelling, journalism and communications processes and tools to make our practices best-in-class and in pace with emerging technologies and their uses by our target audiences.

- Continued the use of social media during events to increase engagement and public awareness of our events
- Integrated more multimedia components into web communications to enhance our storytelling
- Developed research inserts on emerging areas for our corporate brochure , with ongoing production of new inserts to remain current
- Maintained the practice of showcasing our newest faculty members through biographies and videos on our dynamic academic appointments microsite
- Revitalized the *Guide to First Year* through the creation of a hybrid print and online publication ensuring that the most accurate information is available at all times; received over 1,900 hits within the first week of mail out
- Enhanced graduate student recruitment tools with redesigned brochures for research and professional stream students; this will be carried through to the redesigned website; launch expected this fall
- Began the process of redesigning the main Faculty website, with particular focus on improved navigation, content, and marketing; launch expected in 2015
- Re-launched the Faculty's news microsite with improved storytelling capability and search engine optimization
- Developed effective new websites for the Institute for Leadership Education in Engineering, University of Toronto Transportation Research Institute, Division of Engineering Science, and Engineering Student Recruitment & Retention Office
- Created and streamlined several internal tools for our network of 30+ communicators, such as a new Engineering Communications Network hub and email listserv

3.5 Remain flexible to changing media and technologies, nurture blogger and social media relationships, and build relationships and communications with traditional media.

- Established regular updates to our social media platforms such as Twitter and Flickr
- Achieved improved reach in online coverage with almost three quarters coming from online news outlets, blogs and websites
- Through pitches to national newspapers, garnered stories featuring our impact on research and education, such as in the Toronto Star (TTC CEO Andy Byford speaks to ILead students) and Globe and Mail (Professor Yu Sun's research on robotic in-vitro fertilization)

3.6 Increase the Faculty's presence, visibility and reputation on modern social media platforms.

- Transitioned the Faculty's videos from Vimeo to YouTube; the channel and playlists are now highlighted in marketing and promotional pieces
- Established the practice of posting all new news stories to our Twitter account, reaching over 6,000 followers, and our Facebook account, reaching over 1,100 followers
- Released a news video for the Jedi Wars Flying Robotics Competition which has resulted in over 1,400 views

- Received over 70,000 hits to our Convocation Flickr gallery within four days of posting; up dramatically from the previous year's 5,000 hits

4. Educating Future Engineers & Student Experience

Our commitment to providing the highest quality education and enriching the student experience has never been stronger. As we continue into the second half of our five-year Academic Plan, we have taken a number of actions to meet these goals, and to support and promote the ongoing development of global engineering leaders. Several of these goals have already been met.

To prepare our students for success in our complex and globalized environment, we must ensure that they are exposed to a wide range of perspectives, experiences, and beliefs. For this very reason, we are extremely proud of our improved cultural and gender diversity. As a Faculty, we have established a goal of 25 per cent international students at both the undergraduate and graduate levels. We are close to achieving that goal. Our preliminary data for 2014-15 show that international students now comprise 25.9 per cent of the overall undergraduate class. Having reached our target of 25 per cent undergraduate international students, we are now taking this opportunity to investigate how we can diversify the regions of the world that our students come from.

We also understand that by attracting more female students to our undergraduate programs, many will move into graduate programs and industry, ultimately benefiting the engineering profession as a whole. We continually assess and refine our strategic recruitment activities in this area. In addition to hosting the third annual Girls' Leadership in Engineering Experience (GLEE) event, we added a new component to our March Break Open House that specifically targets prospective female students. For 2014-15, our preliminary data indicate that our overall undergraduate female population grew to 25.8 per cent compared to the previous year's 24.8 per cent. We will actively pursue continued growth in this area.

The diversity of our student body is further enriched by undergraduates who participate in exchanges and country-sponsored programs. Last year we hosted nearly 50 exchange students from countries including Australia, India, China, France, Mexico, and South Korea. We remain the number one choice in the world for undergraduate Science without Borders (SwB) students from Brazil with over 300 enrolled in classes in 2013-14.

U of T Engineering experienced yet another record-breaking year in applications to our undergraduate programs, both in terms of quantity and quality. We received 11,132 applications for 1,130 spots, a 10 per cent increase over last year. The final average for students from Ontario high schools is 92.3 per cent, the highest ever recorded by the Faculty. Recognizing that this brilliance is demonstrated by more than just grades, we are taking this opportunity to invest in a broad-based admissions approach that will not only take into account marks, extra-curricular activities and essays but will also include interviews with the applicants to assist in our decision making process.

We are also pleased that our first-to-second year retention rate has increased to 94.6 per cent. This is a result not only of our increased selectivity and high calibre of students, but of the support programs and services we have developed and introduced. These include First Year Foundations, Success 101, first year math support, and an extensive advising program that provides embedded counsellors, an international transition advisor, a learning strategist, and a wellness coordinator.

We continually assess the effectiveness of both our curriculum and our course delivery. Over the past year, we have piloted and refined a number of technology-enhanced and hands-on learning opportunities for our students. On the technology side, we piloted two online first year courses in calculus with engineering applications (APS162 and APS163) with 30 and 20 students participating, respectively in 2013-14. The online version of APS162 was also made available during the summer for incoming students wishing to complete one credit before starting in September 2014. Fifty-one students participated, with 86 per cent passing the course. The Faculty was also awarded funding for three proposals through the Ontario Ministry of Training, Colleges and Universities' Shared Online Course Fund to further develop the above mentioned "Calculus with Engineering Applications I and II" courses, and a mechanics course, that will be made available to students at other Ontario universities. As mentioned in our Year 2 Progress Report, we developed our first massive open online course (MOOC) entitled "The Energetic Earth." It was featured on the edX platform and received over 10,000 registrations. Materials created for the MOOC were repurposed in CIV300 "Terrestrial Energy Systems." Following this experience, we developed a new MOOC entitled Wind, Waves and Tides: Alternate Energy Systems that was launched on the Coursera platform in October 2014.

More and more, our educators are adding value to the student experience by developing reusable learning tools and capturing lectures in digital formats that can be made available to students outside of class time. This allows for more discussion and problem solving during class. The lecture capture of all first year Core 8 courses (with the exception of APS105) for the first time in fall 2013 is a step in this direction. Additionally, we offered two inverted classroom model courses with ECE221 "Electricity and Magnetism" (for the second time) and CIV235 "Engineering Graphics." This experimentation with alternate methods of course delivery allows us to engage our students in different ways and assess the effectiveness of learning strategies on the quality of education. The new Centre for Engineering Innovation and Entrepreneurship (CEIE) will house several Technology Enhanced Active Learning (TEAL) classrooms that will facilitate this type of interactive classroom engagement. Over the summer, we renovated a classroom in Sandford Fleming (SF3201) into a TEAL room to gain more experience in this area. We currently have 24 tutorials and lectures utilizing the space and we will use what we learn over the next year to inform our decisions for the TEAL rooms in the CEIE.

While technology plays an important role in both teaching and learning, we must also encourage the hands-on "tinkering" that engineering requires, and is traditionally known for. We have increased the number of opportunities for students to nurture their inner "maker" and work in teams to effectively bring their ideas to life. This year, we implemented our Multidisciplinary Capstone Projects (MCPs) course through the University of Toronto Institute for Multidisciplinary Design and Innovation (UT-IMDI), which brought together teams of four-five students (all from different departments) to develop solutions to industry-sponsored problems.

The pilot was very well received, with 17 projects and 65 students garnering outstanding feedback from industry involved (e.g. Bombardier, Magna). Our cross-cultural capstone course, where mechanical and industrial engineering students partner with peers at Peking University in China, continues to flourish. Students work together on client-based projects with companies that have operations in both Canada and China, and have two face-to-face meetings throughout the year, with the remaining interactions being conducted online. Participation has grown from 12 students in 2011-12 to 17 in 2013-14, speaking to the increased appeal of this type of program.

The Engineering Instructional Innovation Program (EIIP) was created in 2013 to develop innovative teaching approaches for larger undergraduate courses that have broad impact across the curriculum. The inaugural projects approved through the EIIP focused primarily on developing reusable learning objects to facilitate teaching and improve the learning experience, and are now into their second year. Recently, we approved three projects that will focus on: (i) curriculum renovation of a core second year ECE course, (ii) improving students' ability to make informed and meaningful decisions when ethical situations arise, and (iii) creating resources to support instruction of team effectiveness in non-traditional classroom settings.

Over the past year, the Faculty has introduced new certificates and a minor to allow undergraduate students to further customize and receive recognition for their focus on specific areas. The Certificate in Engineering Leadership focuses on the cognitive and psychological foundations of effective leadership, helping students to think analytically and systematically, and to effectively handle complex challenges. The Certificate in Renewable Resources Engineering offers interdisciplinary courses, in collaboration with the Faculty of Forestry, in sustainable resource management, bio-economies, sustainable energy production, product manufacturing and sustainable communities. The new Biomedical Engineering Minor prepares students for direct entry into the applied biomedical engineering industry, offering courses on the technologies, systems and policy in the field. This is also the first minor to include supporting curricular and co-curricular activities such as mentoring, a seminar course, and optional courses in biostatistics and biodesign.

The value of our cross-disciplinary minors and certificates is certainly recognized by our students. Enrolments continue to increase, with 825 students participating in our five minors in 2013-14. The most popular by far remains our Engineering Business Minor. Classes fill up within minutes and there are long wait lists. To meet demand, we further expanded offerings for the three joint core courses. These core courses are now offered in 20 sections throughout the year. We also expanded the number of summer course offerings to include all three of these courses, along with a technical elective in nuclear engineering for the new Nuclear Engineering Certificate program, and an energy policy course for the Sustainable Energy Minor.

Our culture of entrepreneurship has been further strengthened by the contributions of the Entrepreneurship Hatchery. In addition to speaker seminars and other events throughout the year, students are offered the dedicated space and guidance to develop their fledgling business ideas. This past year, we more than doubled the number of student teams participating in the Hatchery's summer program from 18 to 37. This surpasses our four-year goal – in less than three years – of 20 student teams. Thirteen teams presented their prototypes at the annual demo day held in September 2014 with the \$20,000 Lacavera Prize going to FuelWear, a

company which offers “the first smart heated base layer” for users looking to stay warm for up to five hours.

Creating opportunities for students to build on their competencies through professional development opportunities is vital to expanding their understanding of the world and developing global engineers. Through a mix of Faculty and student-run programs and initiatives, these opportunities have continued to increase.

Over 2,000 students attended the 2014 You’re Next Career Fair organized by the You’re Next Career Network, a student led organization. This year a larger number of industries were represented and over half of the employers participated for the first time, speaking to the growing reputation of this annual event. A second event hosted by the You’re Next Career Network, the inaugural Start-up Career Exposition, was a tremendous success with over 85 start-ups participating from across North America.

The Faculty’s Professional Experience Year (PEY) program is one of the most recognized paid internship programs in Canada. Over 60 per cent of our third-year students participate in the program and many come back for their fourth year with job offers for after graduation. The program has fully recovered from the economic downturn of 2008 and 2009 with placements rising steadily to an all-time high of 723, up from 704 in 2013-14. These students will earn over \$45-million collectively during their PEY term. PEY placements abroad have remained steady with 61 placements this year.

At each Dean’s town hall, job preparation and professional experience is a topic of discussion. We know that we can always do more to give our students the competencies and support they need to succeed in the world post-graduation. With this in mind, we created a task force to holistically review the professional development services offered by both the institution and student run organizations. The task force, comprised of academic, administrative, and student leadership, along with alumni, met over the summer and have scheduled stakeholder consultations for the fall of 2014.

Another mechanism the Faculty uses to solicit student feedback is course evaluations. In the fall of 2013, we moved to a new professionally validated evaluation system, designed to give both summative and formative feedback on teaching. It informs our leadership about how well instructors are meeting the perceived teaching needs of our students and provides input on ways to improve. One immediate outcome has been a marked increase in the amount of qualitative feedback students have provided. And, notably, even on the first round of evaluations, scores were especially high overall on the question that asked how well instructors related course concepts to practical applications and/or current research.

A recurring theme in past evaluations related to the varying quality of tutorial teaching by Teaching Assistants (TAs). Over the summer, we launched an aggressive effort to prepare our TAs who lead tutorials. The TAs are trained on how to run an active, collaborative tutorial effectively so our students have the opportunity to practice applying concepts and principles in a supportive, facilitated tutorial environment. The techniques taught in the training session are based on current best practices in engineering education.

Our first year curriculum is the foundation upon which all future years of study rest. With this in mind, the Faculty undertook a review of our first year curriculum, something last done a decade ago. We appointed a task force who met with constituents at Faculty Council, town halls, and departmental meetings to gather input. They also reviewed best practices at peer institutions as well as relevant literature. Feedback is being synthesized into a number of recommendations that will start being implemented throughout 2014-15. The focus will centre on areas such as improved first year teaching and course delivery, in depth mathematics and science curriculum reviews, integration between courses, and transition to the University learning experience.

Our world-renowned graduate and research programs continue to attract the world's brightest engineering minds. In 2013-14, the Faculty reached an all-time high of 2,064 graduate students, an increase of nearly 40 per cent over the last five years. This surpasses our Academic Plan goal, two years early, of 2,000 graduate students by the year 2015.

As previously mentioned, enriching the environment with diversity of thought, background, and experience leads to new ideas and collaborations that would otherwise not have been possible. Enrolment of women in our graduate programs was relatively on par with last year at 25.9 per cent, while our international enrolment rose to an all-time high of 24.6 per cent in 2013-14. We anticipate that these numbers will continue to climb, particularly as we continue to increase our gender and cultural diversity in our undergraduate program. Additionally, we have expanded our involvement in the Science without Borders program to offer new scholarship options to Brazilian PhD students and, if our experience with the undergraduate program is any indication, we will be the destination of choice for these students in the near future.

Recruitment initiatives and our global reputation influence applications to our graduate programs, as demonstrated in the 25 per cent increase to our professional master's program over last year. For the second year, we have partnered with the top Canadian engineering schools for the Canadian Graduate Engineering Consortium. Events are held across the country to connect with high quality domestic applicants to encourage them to learn more about our programs. Additionally, this is the first year that we are organizing a Faculty-wide recruitment weekend (scheduled for February 2015) that will bring promising domestic students to U of T, providing them an opportunity to discover the benefits of learning and working with our world-renowned researchers.

We continue to develop new programs to offer graduate students opportunities to collaborate across the Faculty and the University. This past year, U of T Engineering partnered with the Ontario Institute of Studies in Education (OISE) to develop and launch Canada's first collaborative program in Engineering Education (EngEd) at both the master and PhD levels. This initiative brings together graduate students from disciplines in engineering and education with shared interests in the research and learning that is at the nexus of education and engineering practice. Ultimately, the program will yield research findings that will benefit STEM learning in K-12, university-level engineering instruction, and continued professional training after post-secondary education.

The Centre for Global Engineering's *Interdisciplinary Approach to Addressing Global Challenges* course brought together graduate students from across U of T to address childhood

malnutrition in Bangladesh. Students developed integrated solutions that combined expertise from U of T Engineering, the Dalla Lana School of Public Health, the Rotman School of Management, and the Munk School of Global Affairs.

The Faculty also expanded our offerings at both the MEng and PhD levels. Two new emphases, Advanced Water Technologies & Process Design, and Sustainable Aviation, provide students with in-depth knowledge of water treatment methods and development of sustainable aircraft, respectively. During 2013-14, we also introduced 15 new graduate courses, including a number of APS courses that are offered to graduate students Faculty-wide. Finally, the Faculty MEng Entrepreneurship, Leadership, Innovation and Technology in Engineering (ELITE) certificate courses are now being administered centrally, which increases efficiency and better accommodates the needs of instructors and students.

The flex-time PhD option, previously only available in mechanical and industrial engineering, is now offered in our chemical engineering and applied chemistry, and aerospace programs. The expansion of this program enables us to attract highly qualified and motivated engineers who work full-time in research and development roles, to pursue doctoral degrees in areas of interest to them and their employers. In doing so, new partnerships are formed that transfer vital knowledge and skills between U of T researchers and industry collaborators.

In the coming year we will continue to assess and refine many of the activities and initiatives discussed throughout this section. The list below highlights our progress thus far toward our goals of educating future engineers and enhancing the student experience.

4.1 EDUCATING FUTURE ENGINEERS: YEAR 3 PROGRESS HIGHLIGHTS

4.1.1 Maintain and strengthen our high-quality education through continued review and assessment of our programs and curricula for currency, vision and relevance. Establish desired learning outcomes for graduate and undergraduate students to ensure they are well prepared as future engineers. Evolve our cyclic reviews and plan for continuous quality assessment within the new UTQAP and CEAB Graduate Attribute systems.

- Established a task force to review the first year curriculum; following broad consultation with students, faculty and staff, recommended changes to Chairs & Directors with implementation planned for 2014-15
- Collected outcomes data through the Graduate Attributes Committee
- Continued development of analytic rubrics to measure learning in several areas related to Graduate Attributes and Undergraduate Degree Level Expectations (UDLEs)

4.1.2 Further integrate professional competencies, such as global engineering, entrepreneurship, leadership and communication into undergraduate and graduate curricula. Define, assess and measure our programs and curricula successes through the UTQAP UDLEs, GDLEs and cyclic reviews and through the CEAB Graduate Attributes.

- Established the undergraduate Certificate in Engineering Leadership
- Created new undergraduate and graduate courses offered through the Institute for Leadership Education in Engineering (ILead)

- Provided multi-year start-up funding through the Dean's Strategic Fund in support of proposals to enhance leadership education, entrepreneurship activities, and global engineering initiatives
- Conducted external review of the Engineering Communication Program in November 2013

4.1.3 Enrich the quality of undergraduate academic experience by increasing flexibility in the undergraduate curriculum, continuing to develop progressive opportunities for students to pursue their professional interests, and integrating professional competencies throughout the curriculum.

- Through the Undergraduate Curriculum Committee, continued to assess and adjust curriculum in all programs, as necessary
- Launched the undergraduate Biomedical Engineering Minor
- Expanded sections and summer offerings of core Engineering Business Minor courses to meet demand
- Developed undergraduate certificates in Engineering Leadership and Renewable Resources Engineering
- Realized steady growth in our Professional Experience Year (PEY) program with 723 engineering students placed (up slightly from 704 the previous year)

4.1.4 Continue to support and enhance undergraduate students' opportunities for self-directed learning and study time, and participation in the enriching extracurricular activities within our Faculty, across the University, and beyond.

- Piloted online courses for Calculus with Engineering Applications I and II (APS 162 and 163) with the online version of APS 162 also offered during the summer for incoming students wishing to complete one credit before starting in September 2014
- Developed an online version of CIV 100 – Mechanics (APS 160 – Mechanics) for the 2014-15 academic year
- Created our second massive open online course (MOOC), this time on the Coursera platform, in Wind, Waves and Tides: Alternate Energy Systems (offered beginning October 2014)
- Provided lecture capture for the majority of our first year Core 8 courses, allowing students to review lectures outside of class
- Piloted an inverted classroom model in Electricity and Magnetism (ECE 221) and in Engineering Graphics (CIV 235), enabling students to review material in advance and use class time for more hands on engagement with instructors

4.1.5 Enhance our instructional space to facilitate innovative teaching methods and create efficiencies on how we share space. This includes flexible interactive teaching space for substantial numbers of students, design and group project space and lecture/lab combination space.

- Established a prototype Technology Enhanced Active Learning (TEAL) classroom in SF3201; 24 tutorial and lecture sections are actively using this space in fall 2014
- Through matching from the Dean's Strategic Fund, significantly upgraded equipment in the IBBME Undergraduate Teaching Lab
- Developed plan for a new 64 seat capacity computer lab in the CEIE building, along with significant informal student study seating in common areas throughout the building

- Commenced third phase of our space audit to address the significant shortage in undergraduate teaching labs space through the establishment of selected generic undergraduate labs that would be used to support multiple courses across departments

4.1.6 Provide reliable, accessible, effective computing services and study spaces within and outside computer laboratories, library and classrooms to enhance efficient interactive learning and socialization where today's student 'lives'.

- Added 88 student study spaces to the Bahen Centre inventory of hallway seating
- Upgraded half (200) of the ECF lab PCs and all (400) of the monitors to high quality 24" LCDs
- Established a new MIE computer lab in the Lassonde Mining Building
- Approved funding for 5 Dean's Strategic Fund proposals to improve design, club, and meeting spaces throughout the Faculty
- Renovated SF3201 into a Technology Enhanced Active Learning (TEAL) classroom

4.1.7 Link the quality of student learning, the quality of their education and their improved future performance with teaching effectiveness. Continue to inspire and support the Faculty's culture of teaching excellence and encourage Faculty members and teaching assistants to reflect upon their teaching effectiveness through enhanced feedback mechanisms. Support teaching initiatives and opportunities that will improve their professional development as educators.

- Moved to a professionally validated course evaluation system which informs our academic leadership about how well instructors are meeting the perceived teaching needs of our students and provides input on ways to improve
- Implemented new TA training over the summer of 2014 to improve quality of tutorials
- Hosted 2nd annual First Year Instructors Day in summer 2014 to discuss best practices

4.1.8 Continue to attract and retain diverse, outstanding students from a wide range of backgrounds in order to provide an exceptional education for future global engineers and leaders. In particular, we must strive to attract more female students into our programs.

- Hosted the third year of Girls' Leadership in Engineering Experience (GLEE), with the majority of participating female students accepting their offers to U of T Engineering
- Added a new component to the March Break Applicant Event – Engineering Mythbusting – featuring panel sessions run by students targeting common misconceptions
- Female applications rose in 2014 to 23% from 21% the previous year; women currently make up 30.5% of the first year class and 25.8% of the overall class (preliminary, 2014-15), and 26% of the graduate class
- International students comprised 25.9% of the overall undergraduate class, surpassing our goal of 25% (preliminary 2014-15) and 25% of all graduate students

4.1.9 Strategically award admission scholarships to meet our student recruitment goals.

- Continued participation in the University-wide President's Scholars of Excellence Program with unique elements added for engineering students

- Reviewing all scholarships and awards with the goal of improving visibility and participation

4.1.10 Reduce the dwell time for MASc and PhD students and address time-to-graduation issues.

- Reduced time-to-graduation to 5.2 years (overall) compared to 5.3 the previous year
- Began development of detailed data on time-to-completion and fast tracking with the goal of using the data to identify and share best practices, as well as identify problems to be addressed

4.1.11 Continue to develop vibrant MEng programs and offer a larger variety of courses suitable to MEng students.

- Introduced 15 new courses, including a number of APS courses that are offered Faculty-wide
- Launched new graduate emphases in Sustainable Aviation and Advanced Water Technologies & Process Design
- Developing graduate emphases in sustainable energy and advanced manufacturing

4.1.12 Increase graduate student enrolment to reach 2,000 graduate students by 2015, with particular focus on increasing PhD and MEng students and aiming to reach an average of one PhD graduated annually per faculty member. At the same time, we will endeavour to reduce our undergraduate student enrolment to 4,000 by 2015, with 25% of undergraduates consisting of international students. In fall 2010, Full-Time Equivalents (FTEs) were 4,599 undergraduate and 1,527 graduate students, a percentage ratio of 75.1% to 24.9%.

- Met and surpassed goal with 2,064 graduate students enrolled in 2013-14
- Marked progress towards our long term goal of a 60%:40% undergraduate to graduate student ratio (currently 2.6:1 from 3:1 in 2010)
- Applications to our MEng programs increased by 34% over last year and more than 100% over 5 years ago

4.2 STUDENT EXPERIENCE: YEAR 3 PROGRESS HIGHLIGHTS

4.2.1 Ensure that all our undergraduate curricula provide students with sufficient self-directed time to fully reflect on and understand the material in their program, the vision and relevance to 'learn how to learn,' and the advantage of taking opportunities to experience and engage in University life outside the classroom through extracurricular and co-curricular activities.

- Piloted Facilitated Study Groups (FSG) in 2013-14, hired 11 leaders to support 17 first year courses through the supplementary instructional model that promotes the development of critical thinking skills
- Rebranded these FSG sessions in 2014 as Peer Assisted Study Sessions (PASS) and implemented more intentional scheduling and marketing to improve attendance; currently supporting 6 courses this term (3 Core 8 and 3 EngSci)
- First year retention rate increased to 94.6% in 2013-14 from 93.7% the previous year

- Engaged the inverted classroom model in two courses (ECE 221 and CIV 235), allowing students more time in class for inquiry, application and assessment of material with instructors
- Provided tools and resources in support of 37 project teams (109 students) taking part in the Entrepreneurship Hatchery's summer program

4.2.2 Engage more undergraduates in faculty research activities. Enhance summer opportunities for our undergraduates by expanding the Engineering Summer Internship Program (eSIP) and by increasing summer research opportunities both within the Faculty and through agreements with international institutions.

- Summer research abroad participation increased from 9.7% in 2012-13 to 15% in 2013-14
- Proactively researched and identified eligible eSIP opportunities from a wide variety of sources and made them available on the Engineering Career Centre portal, offering 40 additional opportunities
- Targeted outreach to industry partnerships to create more eSIP opportunities
- Signed Memorandum of Understanding (MOU) for student exchange with TU Darmstadt, one of Germany's highest ranked universities in both teaching and research, opening the door for some of our brightest Engineering Science students to participate in summer research

4.2.3 Enhance our students' access to electives outside technical courses.

- Continued discussions with the Faculty of Arts & Science regarding a mutual interdivisional teaching agreement
- Improved access to popular Arts & Science courses for undergraduates with 670 spaces reserved for engineering registration
- Significantly increased the number of sections in our Joint Rotman School-Engineering courses for the Engineering Business Minor and Certificate over the last 3 years from 5 to 20

4.2.4 Enhance our undergraduate and graduate students' non-traditional educational opportunities, including international academic exchanges and internships, courses offered abroad, field courses, and credit for work in extracurricular activities such as design teams.

- For the second year, participated in the Globex Program at Peking University (PKU) with 5 MIE students taking part in an intensive four-week summer program at PKU, exposing them to new ideas, research, people, and culture
- Select MIE students worked with counterparts at PKU on cross-cultural capstone projects; students work together (virtually and in person) to arrive at solutions to problems proposed by clients who hold operations in both Canada and China, such as GM and Bombardier
- Implemented a new route to exchange through the APS 299 course, which will be a credit bearing course for some students who do research abroad and choose to structure it as a course
- The Entrepreneurship Hatchery provided guidance, tools and resources to 109 students in 37 project teams as they developed their business ideas and technical innovations

4.2.5 Continue to inspire the Faculty's culture of teaching excellence and support teaching initiatives that improve student experience, support their connections with course content, increase in-class engagement and strengthen students' understanding of course relevance.

- Hosted 2nd annual First Year Instructors Day with approximately 30 people in attendance
- Appointed a task force to review the first year core curriculum; following broad consultation, presented recommendations to Chairs and Directors, implementation is anticipated for 2014-15
- As previously mentioned, renovated SF3201 into a TEAL classroom, and piloted two inverted classrooms
- Through the Engineering Instructional Innovation Program, funded 3 projects that will: (i) create case studies on ethics and decision making, (ii) renovate second year ECE courses that have broad implications in future years, and (iii) train instructors on teaching and evaluating teamwork beyond traditional methods

4.2.6 Promote extracurricular activities through communications, faculty mentoring and suitable space and facilities.

- Consolidated student clubs' space at 256 McCaul Street and 70 Spadina Ave, including music clubs, establishing a new multi-purpose room for events and rehearsals
- Approved funding for 5 Dean's Strategic Fund proposals to improve design, club, and meeting spaces throughout the Faculty
- Installed a large-scale projection system, tied to the Faculty's digital display network, which allows the Engineering Society and its affiliated clubs to display digital banners

4.2.7 Actively engage and support students in their unique academic and non-academic experiences as soon as they enter our Faculty, so they can thrive throughout their studies.

- Enhanced several elements of First Year Foundations; over 150 students attended Success 101 in summer 2014
- Prepared a series of short videos based on Success 101 material (e.g. study habits, time management, academic orientation) and posted these on YouTube for international students and students outside the GTA
- Offered the math transition program which allows students entering first year to assess their math skills and attend remedial tutorials early on if necessary
- Developed and implemented new programming to support international student transition, expanded our mentorship program, and created a new International Transition Advisor role

4.2.8 Engage Master of Engineering (MEng) students to improve the quality of their experience.

- Expanded MEng offerings with new emphases in Sustainable Aviation and Advanced Water Technologies & Process Design
- Introduced 15 new courses, including a number of Faculty-wide graduate courses
- Streamlined the administration of our Faculty-wide Entrepreneurship, Leadership, Innovation and Technology in Engineering (ELITE) certificate courses to facilitate the needs of students and instructors
- Moved to a new online course evaluation system for graduate courses in fall 2014 to provide enhanced feedback to instructors on the quality of their teaching

4.2.9 Enrich graduate students' academic life and build a stronger sense of community

among graduate students across the Faculty.

- Launched Canada's first collaborative program in Engineering Education (EngEd) at both the master and PhD levels in partnership with OISE; bringing together graduate students from disciplines in engineering and education with shared interests in the research and learning that is at the nexus of education and engineering practice
- Implemented new TA training over the summer 2014

5. Research Foci

The tremendous impact of research at U of T Engineering is felt at all levels of society – local, national, and international. Engineers are known as creators and innovators. As Albert Einstein said, “Scientists investigate that which already is, engineers create that which has never been.” The exciting research taking place in our Faculty attracts brilliant researchers and students to join our ranks, and enables us to attract the funding and partnerships necessary to continue our groundbreaking work.

One of the key goals of our Academic Plan respective to our research portfolio has been to increase our Tri-Council funding to \$25-million per year by 2015. Through our collective efforts, we have surpassed this goal three years early by reaching \$26.3-million in 2012-13 and have established a new goal of \$32-million in Tri-Council funding by 2015-16. The importance of this funding is underscored by the fact that the national reallocation of Canada Research Chairs (CRCs), which occurs every two years, is based on the proportion of Tri-Council and Networks of Centres of Excellence (NCE) funding that each university receives. In 2012-13, CRCs represented \$3.5-million of revenue for the Faculty. This progressive growth in Tri-Council funding translated into U of T Engineering receiving an additional four Tier II equivalent CRCs in the 2013 reallocation.

Engineering received 17 grants through the Canada Foundation for Innovation’s (CFI) John R. Evans Leaders Fund. These were matched by Ontario Research Fund – Research Infrastructure grants for a total to \$3.4-million. They will be applied to developing infrastructure that will help to advance research in areas ranging from improving air quality, to creating superior renewable energy technologies.

The Ontario Centre for Characterization of Advanced Materials (OCCAM), which began development in 2012, received \$20-million in funding through a combination of funding from CFI, the Ontario Ministry of Research and Innovation (MRI), and Hitachi High-Technologies Canada, and officially opened in July of this year. This facility enables researchers to explore and develop new materials that can be used in several diversified applications such as electronics, renewable fuels, and medical treatments. A joint initiative between the Department of Materials Science & Engineering and the Department of Chemical Engineering & Applied Chemistry, OCCAM emphasizes the development of collaborative and multidisciplinary projects, and is available to both academia and industry.

We continue to receive strong support from the Natural Sciences and Engineering Research Council (NSERC) for our innovative and impactful research. Earlier this year, we were awarded six Strategic Projects Grants (SPG), as well as an NSERC Collaborative Research and Training Experience (CREATE) grant. This brings our Faculty to eight CREATE programs (out of 11 at U of T). This new CREATE will support student training in environmental remediation, such as investigating new methods for decontaminating groundwater, through the Remediation Education Network (RENEW). The 42 funded doctoral stream graduate students and

postdoctoral fellows participating in the RENEW program will dedicate 20 per cent of their time toward working within partner companies, which will not only provide valuable practical experience for the participants, but will also serve to strengthen our ties with our industrial partners.

U of T Engineering develops and fosters a thriving multidisciplinary and collaborative environment. In 2014, we expanded our network of research centres and institutes with the addition of two new Extra-Departmental Units (EDU:Cs), the University of Toronto Transportation Research Institute (UTTRI) and Toronto Institute of Advanced Manufacturing (TIAM), which will further enhance the Faculty's profile in key research areas central to our region and economic growth.

All major urban centres face the challenge of developing and maintaining a transportation infrastructure that will both meet the needs of their citizens, and enable their growth and prosperity. The University of Toronto Transportation Research Institute (UTTRI) builds on the Civil Engineering department's leading strengths in this area through bringing experts from engineering, economics, policy, urban geography and planning, computer science and others disciplines together for collaborative projects. UTTRI aims to solve some of the most pressing problems facing our cities today. Topics include dynamic real time control of road and transit systems for capacity maximization, improved urban logistics systems for goods movement, and improved urban design for walking and cycling.

Canada's manufacturing sector is vital for economic growth and innovation. The new Toronto Institute of Advanced Manufacturing leverages the strength of our research and partnerships in this area and will create and scale up advanced manufacturing technologies and develop innovative practices for the 21st century. This multidisciplinary partnership includes researchers from across the Faculty and will explore new technologies, and advanced materials.

Support from and partnership with industry is crucial to our fiscal stability. It helps us to leverage funding opportunities, and facilitates the commercialization and translation of innovative research to market. Our Faculty now has two directors of corporate partnerships to strengthen connections between industry and academia, enable NSERC partnerships funding opportunities, and assist our faculty members in developing lasting relationships with companies in key sectors.

The creation of a flexible and customizable corporate brochure that highlights the benefits of partnership with U of T Engineering, and showcases specific research strengths, is one of the tools we are now using to communicate with potential and existing partners. Our annual industry partners networking event, held in November of each year, also facilitates introductions that lead to vibrant idea generation and collaborative projects.

Through the collective efforts of the Faculty and our departments, we have pursued and attracted more support for our research programs. This is evident, in part, by our 7 per cent year-over-year increase in NSERC funding. Each department and institute now has a peer review or mentorship program in place to support and guide faculty members in the development of their NSERC Discovery Grants (DGs), Discovery Accelerator Supplements (DAS), and Research Tools and Instruments (RTI) grant applications. We once again hosted

panel sessions on DG and the RTI program. This year we continue our Best Practices in Research lunch sessions covering a range of dynamic topics such as impactful research and best practices for junior faculty in their pursuit of the Early Research Award. We also awarded the second annual Research Leader Award to Professor Javad Mostaghimi for leadership in interdisciplinary and multiple investigator initiatives that have enhanced the Faculty's research profile within the broader community.

These initiatives, among others, provide encouragement and support to our faculty members at all stages of their careers and ensure our continued success as we progress on our path in pursuit of excellence in research.

5. RESEARCH FOCI: YEAR 3 PROGRESS HIGHLIGHTS

5.1 Create new and support current research centres around strategic research themes that make significant, relevant impacts on society.

- Established the University of Toronto Transportation Research Institute (UTTRI) in February 2014
- Launched the Toronto Institute of Advanced Manufacturing (TIAM) in April 2014
- Revitalized the Centre for Healthcare Engineering (CHE) (formerly the Centre for Research in Healthcare Engineering)
- Built and implemented a process to review and encourage EDU:Cs and EDU:Ds in their development and research

5.2 Increase our Tri-council funding level to \$25-million per annum by 2015.

- Met and surpassed goal, reaching \$26.3-million in 2012–13

5.3 By 2015, increase the number of Canada Research Chairs by eight (to a total of 30), increase Industrial Research Chairs by six (to a total of 10) and increase Endowed Chairs and Limited Term Chairs by 13 (to a total of 40).

- Increased number of CRC Tier-II equivalents by 4 to 39 in 2013-14
- Actively working to identify new IRC and endowed chair prospects (currently we have 7 IRCs and 30 endowed chairs)
- Shared best practices in fostering growth of sponsored research, which in turn impacts the Faculty's CRC allocation over time, through the Faculty's Research Committee

5.4 Develop additional funding sources through the Social Sciences and Humanities Research Council (SSHRC), the Canadian Institutes of Health Research (CIHR), corporations, industries and international granting agencies.

- Focused on industry-sponsored research and matching Tri-council and Ontario partnerships funding
- Hosted second annual Industry Partners Networking Reception in November 2013
- Actively pursued opportunities with top corporate prospects
- Increased awareness of and built partnerships among faculty for opportunities in technologies for health

5.5 Support junior faculty members and emerging research leaders to ensure that they successfully secure external research funding from industry, federal and provincial sources.

- Research Committee and Directors of Corporate Partnerships worked with junior faculty to identify and pursue industry partners
- Continued lunchtime panel series entitled *Best Practices in Research* to raise awareness and support emerging research leaders
- Established a peer review or mentorship program in each department to support and guide faculty members in the development of their NSERC Discovery Grant (DG) and Research Tools and Instruments (RTI) grant applications

5.6 Raise awareness and promote our research contributions and breakthroughs with peers, funding agencies, industry and the public.

- Developed a corporate brochure that highlights our key research strengths, and the benefits of partnering with U of T Engineering; it is fully customizable, and can be tailored to target specific audiences, or to feature a specific department or research area
- Awarded the second annual Research Leader Award for leadership in interdisciplinary and multiple investigator initiatives that have enhanced the Faculty's research profile within the broader community

5.7 Generate synergistic research partnerships with peer institutions within Canada, and strategic international partners, while taking on leadership roles at the national and international levels.

- Enhanced collaboration and partnership with the Vice-President of University Relations and the Vice-President of Research Innovation on international partnership development
- Ensured Faculty participation on U of T collaboration with the University of Sao Paulo on Global Cities, as well as visits from École Polytechnique Fédérale de Lausanne and Skolkovo Institute of Science and Technology
- Created a NSERC Strategic Network in partnership with Concordia University and the University of British Columbia

5.8 Increase participation and provide leadership on external review committees in granting agencies such as the Natural Sciences and Engineering Research Council (NSERC), Ontario Centres of Excellence (OCE), and the Ontario Ministry of Research and Innovation (MRI).

- Worked with NSERC representatives to make the case for NSERC Strategic Project Areas of interest to FASE, UofT, and Canada
- Met with several ministers and Tri-Council leadership, for example with Minister Reza Moridi, Minister of Research and Innovation, where we discussed entrepreneurial advances and research infrastructure in FASE
- Liaised with OCE representatives to foster entrepreneurship among graduate students

5.9 Enhance multidisciplinary, collaborative research endeavours.

- Attracted a new NSERC CREATE project to establish the Remediation Education Network (RENEW)

- Established the University of Toronto Transportation Research Institute (UTTRI) and Toronto Institute of Advanced Manufacturing (TIAM)
- Enabled 14 collaborative research centres and initiatives through the Dean's Strategic fund, including the Institute for Research into Exposomics Based Assessment (IREBA) and the Initiative for Global Urban Shelter (IGUS)
- Hosted the Connaught Global Challenge Symposium – Bio-inspired Ideas for Sustainable Energy
- Awarded six NSERC Strategic Projects Grants
- Attracted 4 grants from Grand Challenges Canada

6. Outreach, Collaboration and Influence

Collaboration is vital to successfully address many engineering challenges; this also holds true for the Faculty. If we are to achieve our ambitious goals, we must seek out collaboration and reach out to individuals, industry, government, and peer institutions to share our knowledge and to influence practice. In so doing, we further the excellent work that we undertake to address the world's most pressing challenges. By working with key stakeholders to achieve our common goals, we will increase our impact on, and contribution to, our society and community of peers. The creation and transfer of knowledge, creation of jobs, and creation of countless inventions and innovations all serve to make our world a better place.

Strengthening research partnerships with industry creates mutually beneficial results. Industry partnerships provide us with a source of funding to enable our mission, while industry gains access to brilliant minds and excellent testing facilities, which enables them to bring new processes, products, and technologies to market. Through departmental open houses, topic-specific research days, and Faculty-wide industry events, we continue to steward our relationships with existing industry partners, while developing new relationships with prospective industry partners. To convey the value of these relationships, we created a corporate brochure that highlights our key research strengths and the benefits of partnering with U of T Engineering. The brochure is fully customizable, so can be tailored to target specific audiences, or feature a specific department or research institute.

Our outstanding international reputation as Canada's premier engineering school continues to attract top exchange students. Our participation in the Science without Borders (SwB) program continues to be a tremendous success, and we remain the number one choice for these students. This year we have 301 Brazilian students participating in our programs. In addition, each year we have approximately 50 students from countries including Australia, China, France, Korea, India, and Mexico, who undertake exchange programs with us. When these students leave U of T Engineering, they often return to their home countries as ambassadors for our programs, spreading the word among their peers about the quality of our educational programs.

Through partnerships with peer institutions, we build on our excellence in research and education. Peking University (PKU) is the premier university in mainland China and we are pleased to participate, in partnership with this distinguished institution, in two successful programs that greatly enrich our students' experience:

- The Global Exchange Initiative (Globex) gives MIE students the opportunity to take part in an intensive four-week summer program at PKU, exposing them to new ideas, research, people, and culture. Select MIE students also collaborate with students at PKU throughout the year on their fourth year capstone design projects. These students work together to arrive at solutions to problems proposed by clients who hold operations in both Canada and China, such as GM and Bombardier. Through in-person and virtual meetings, students learn to work as a team in circumstances that mirror those found in global partnerships, such as working over distance and across cultures, thus providing

them with a rich, real life experience. U of T Engineering was the first Canadian partner in this program.

- The Faculty has also entered into Memoranda of Understanding (MOU) with both Shanghai University and TU Darmstadt. A second pilot 3+1+1 program was established with Shanghai University, whereby students will be able to complete the fourth year of their undergraduate studies through our MIE program, while also receiving conditional acceptance into our MIE MEng program. TU Darmstadt is one of Germany's highest ranked universities in both teaching and research. The signing of this MOU for the exchange of students opens the door for some of our brightest Engineering Science students to participate in summer research at this top institution.

Our alumni community is now over 40,000 members strong and they are our ambassadors to the world. Cultivating strong ties and building on the passionate sense of community that is so intrinsic in Skule spirit is essential to our overall success in outreach, collaboration, and influence. U of T Engineering alumni give back through their participation in recruitment and post-acceptance events, as well as through their generous donations to scholarships and infrastructure investments; in particular, the Centre for Engineering Innovation & Entrepreneurship (CEIE).

Most notably, we have increased our efforts in the Asia-Pacific region over the past few years, visiting a full complement of countries in the region twice each year. This is aiding our efforts to build a stronger sense of community among our alumni, and is impacting philanthropic giving in positive and substantive ways. In 2013-14, Dean Amon travelled to the region to officially launch fundraising campaigns supporting named spaces in the CEIE, in South Korea, Hong Kong, Singapore, Malaysia, Indonesia, and Taiwan. A return visit this spring provided opportunity to reconnect and to mark the successful completion of chapter campaigns in Hong Kong and Singapore. To date, Hong Kong alumni have contributed over \$5-million to the Engineering Boundless Campaign, while Singapore/Malaysia not only met, but surpassed their fundraising target. This year we will increase the number of topical events held in Asia-Pacific and continue our efforts to strengthen the ties and traditions that connect us to our largest alumni base outside of Canada.

For students actively engaged in the Skule community, it is a natural extension for that participation to continue the tradition when they become alumni. We are extremely fortunate to have so many of our alumni contribute their time and talents to U of T Engineering. This ranges from volunteering as mentors and sponsors, to participating in various committees and advisory boards, or serving as panelists and volunteers with club activities. Alumni are already engaged in incubating projects and helping to develop students' entrepreneurial skills through the many innovative initiatives that will eventually take full root in the CEIE (such as the Entrepreneurship Hatchery). One of our newest initiatives is the establishment of a Young Alumni Board, comprised of recent graduates who are recognized leaders in their fields and philanthropic supporters of the Faculty. The goal of this board is to engage and involve alumni in fundraising and community-building initiatives.

In 2013-14, we experienced our most successful year in fundraising. Through the generous support of a record number of major donors, we raised nearly \$22-million which, combined with funds raised at earlier stages of the campaign, brings us more than halfway to our \$200-million Engineering Campaign goal. This year's contributions nearly double the amount of major gifts secured last year, and over \$10-million of that amount was directed to support the CEIE building, the cornerstone of our Boundless Campaign. This new space will further inspire creativity and 21st century learning across our Faculty. The tremendous support we have received from alumni, friends, students, faculty, and staff demonstrates their belief in, and commitment to, our vision for the future. We look forward to building on this momentum and making even further progress towards achieving our goals this year.

6. OUTREACH, COLLABORATION AND INFLUENCE: YEAR 3 PROGRESS HIGHLIGHTS

6.1 Better understand the breadth of the Faculty's current outreach, collaborative and influencing efforts, then efficiently manage, support, develop and communicate these activities.

- Developed a corporate brochure that highlights our key research strengths, and the benefits of partnering with U of T Engineering; can be customized to target specific audiences, or to feature a specific department or research area
- In preparation for our main Faculty website redesign, met with stakeholders to assess their perceptions and needs of the site and ways to engage various audiences
- Building on the previous year's alumni relations strategic planning, monitored metrics for measuring alumni engagement – now at 12% vs. 9% last year

6.2 Continue building meaningful involvement and relations with Engineering alumni.

- Hosted 61 alumni events across the globe in 2013-14
- BizSkule events in San Jose and Toronto showcased engineering leadership with compelling speakers and panelists
- Established fundraising communities and officially launched fundraising campaigns in November 2013 in Hong Kong, Indonesia, Malaysia, Singapore, South Korea and Taiwan in support of nationality named spaces in the CEIE building; subsequent visit in May 2014 marked successful completion of campaigns in Hong Kong and Indonesia
- Created the Young Alumni Board, comprised of recent graduates who are recognized leaders in their fields and philanthropic supporters of the Faculty, to engage and involve younger alumni in fundraising and community-building initiatives

6.3 Strengthen relationships with other University of Toronto Faculties.

- Developed Canada's first collaborative program in Engineering Education (EngEd) at both the master and PhD levels in partnership with OISE
- Continued discussions with the Faculty of Arts & Science regarding a mutual interdivisional teaching agreement
- During a recent visit from the president of CAF – Latin America Development Bank, worked with the Faculty of Arts & Science to showcase U of T's research strength in all areas of infrastructure

- Through the Centre for Global Engineering (CGEN), offered the Interdisciplinary Approach to Global Challenges course which brought together graduate students from U of T Engineering, the Dalla Lana School of Public Health, the Rotman School of Management and the Munk School of Global Affairs

6.4 Further develop sustainable collaborations with industry partners, and expand established partnerships with affiliated hospitals and research institutes.

- Hosted second annual Industry Partners Networking Reception in November 2013
- Actively pursued opportunities with top corporate prospects
- Hosted departmental industry research events
- Through the University of Toronto Institute for Multidisciplinary Design & Innovation (UT-IMDI), engaged industry clients such as Bombardier and Magna for summer projects and multidisciplinary capstone design projects
- Engaged alumni in industry to act as mentors and judges for the Entrepreneurship Hatchery's concept development program

6.5 Further develop connections with local communities, businesses and the City of Toronto.

- The City of Toronto tested U of T Engineering graduate Samah El-Tantawy's (CivE) smart traffic light system on 60 downtown Toronto intersections, reducing delays up to 40%
- City of Toronto's Entrepreneurship Award won by alumnus Hargun Suri (CompE 1T3); the award is designed to recognize the significant contributions that international students make to Toronto's economic and socio-cultural development
- Established the University of Toronto Transportation Research Institute (UTTRI), which works closely with the city on a number of transportation related initiatives

6.6 Build upon high school outreach and continue to assess our pre-university activities with the goal of optimizing faculty and student involvement.

- Held our third successful Girls' Leadership in Engineering Experience (GLEE) event in May 2014
- Visited more than 200 GTA schools during May/June 2013 through our In-School Workshop program for students in grades three to eight
- Launched the DEEP (Da Vinci Engineering Enrichment Program) Saturday Workshops, which allow participants to explore cutting-edge engineering applications, such as sustainable energy, biomedical engineering and robotics
- Hosted the inaugural FIRST LEGO League International Open in June 2014, exposing students aged 9-14 to real-world engineering challenges by building LEGO-based robots to compete on a thematic playing surface

6.7 Develop strategic relationships with desirable peer, national and international Engineering schools.

- Participated for the second year in the Global Educational Exchange (Globex) initiative with Peking University
- Entered a new exchange agreement with the University of Shanghai
- Signed a MOU on student exchange with TU Darmstadt

- Welcomed 301 Brazilian students through the Science Without Borders scholarship program in September 2014
- Welcomed 50 exchange students from Universities around the world.

6.8 Increase influence in government and public policy decisions.

- Worked with NSERC representatives to make the case for NSERC Strategic Project Areas of interest to FASE, U of T, and Canada
- Met with several ministers and Tri-Council leadership, for example with Minister Reza Moridi, Minister of Research and Innovation, to discuss entrepreneurial advances and research infrastructure in FASE

6.9 Develop a culture of stewardship and gratitude to the alumni and donors who provide philanthropic support to the Faculty.

- Publicly recognized several major donors through online news articles and print publications
- Organized our third Annual Dean's Dinner in October 2014 to recognize donors and acknowledge their generous gifts in support of the Faculty
- Celebrated 11 alumni at the U of T Arbor Awards
- Fostered dialogue with alumni and friends in support of our Engineering Campaign goals

6.10 Encourage the participation of administrative staff in professional associations related to their area of expertise, and in the mentoring programs offered by the University.

- Through regular meetings of departmental business officers and our new Human Resources office, explored opportunities for formal and informal initiatives to encourage staff development

7. Resource Allocation

The quality of our education and research is evident in our innovation and impact. However, in order to achieve the goals of our Academic Plan, we also require adequate resources in the form of funding, space, infrastructure, and personnel. These resources, when utilized creatively and strategically, enable us in our pursuit of excellence.

Over the past four years, the Faculty has been operating under a budget model that was designed to increase transparency, share revenues, and incentivize departments and institutes to take ownership in the way they manage their funds, while continuing to meet their academic priorities and contain costs. This past year, we established a task force to review impacts of the budget model over the first three years of implementation, with a view to determine what (if any) adjustments were necessary. A set of recommendations was presented to, and accepted by, Chairs and Directors. The vast majority of changes were minor in nature, and others served to formalize practices in certain areas. Overall, the budget model is proving to be extremely beneficial and we will continue to review and refine the mechanism, as necessary.

We maintained our strong financial position in 2013-14 with total revenue growing by 7.9 per cent over last year. Revenues increased most significantly from rising philanthropic donations and international enrolments, both graduate and undergraduate. This revenue growth, combined with a prudent operating budget and careful fiscal management, has enabled us to rebuild reserves, upgrade much-needed infrastructure, and invest in the Dean's Strategic Fund to seed a range of new initiatives across the Faculty.

Now in its fourth year, the Dean's Strategic Fund has committed over \$14-million to projects designed to further the goals identified in our Academic Plan, such as enhancing the student experience and fostering multidisciplinary collaboration. Several exciting initiatives were recently approved including the Initiative for Global Urban Shelter (IGUS) from CGEN and the Department of Civil Engineering, the creation of a Centre for Social Services Engineering through the Department of Mechanical and Industrial Engineering, and the development of a University of Toronto Engineering Distinguished Visiting Scholar program.

In 2013, a portion of the Dean's Strategic Fund was allocated to the Engineering Instructional Innovation Program (EIIP) to assist development of innovative teaching approaches for larger undergraduate courses that have broad impact across the curriculum. Funding for eight projects has been committed for development, to date. This year the EIIP will fund three projects that focus on: (i) curriculum renovation of a core second year ECE course, (ii) improving students' abilities to make informed and meaningful decisions when ethical situations arise, and (iii) creating resources to support instruction of team effectiveness in non-traditional classroom settings.

We have made tremendous progress this past year in realizing our vision for the Centre for Engineering Innovation & Entrepreneurship (CEIE). This new building will be a vibrant hub bringing together faculty, students, alumni, and industry partners to further our goals of cross-disciplinary collaboration and entrepreneurship. It will be the future home to several of our new

and established research and education centres, including the Centre for Global Engineering (CGEN), Institute for Sustainable Energy (ISE), Toronto Institute of Advanced Manufacturing (TIAM), Institute for Leadership Education in Engineering (ILead), and the University of Toronto Institute for Multidisciplinary Design & Innovation (UT-IMDI). Our researchers will be clustered in “nerve centres” that foster open collaboration and idea generation. Our students will benefit from access to the dedicated club space that will be assigned in the CEIE, and will thrive in the hands on collaborative learning spaces in our Technology Enhanced Active Learning (TEAL) classrooms, design meeting rooms, interactive auditorium, as well as light fabrication and prototyping facilities. The establishment of the Entrepreneurship Hatchery within the CEIE will help students learn how to turn their ideas into viable start-ups, will greatly support student development and will strengthen mentorship links between students and alumni. We anticipate that the finest global engineering leaders and entrepreneurs of the future will have their start at the CEIE.

The Faculty received approval for the CEIE from all levels of University governance, culminating in Governing Council’s assent in February 2014. However, the project timeline has been set back slightly, as the City of Toronto has advised that the project plan must undergo a rezoning process. We are now optimistically awaiting approval to proceed, which is expected in late February 2015. In the interim, we are proceeding with the detailed design phase and preparing the call for tender. We anticipate holding a celebratory ground breaking in the late spring, and look forward to progressing to the next phase of this transformative project.

The CEIE is a key component of our future plans to alleviate some of our critical space issues. However, it is a longer term solution and does not address our current, equally pressing needs. Our most immediate path to bring some relief to the challenges we share in space shortages and aging facilities is to carry forward with our creative and strategic approaches to space allocation and renovations. This past year several facilities were renovated and revitalized, including the laser/combustion lab at UTIAS, Phase IV of BioZone, the IBBME Undergraduate Teaching Laboratory, and the MIE Computer Lab. Earlier this year we were informed that our student clubs located in 245 College Street would need to vacate to make way for redevelopment of the site for a future student residence. The majority of the clubs were relocated to 256 McCaul Street in May, and we are now looking at options to bridge club accommodations to the opening of the CEIE.

We completed our second space audit to assess our current systems and maximize our use of space. This included a phased implementation of a shared meeting space, and we are currently evaluating its effectiveness and ongoing utilization. We have now progressed to the third phase of the space audit by establishing a committee to conduct an audit of our undergraduate teaching labs.

While our Faculty continues to be effective in managing space and budgets, philanthropy remains vital to realizing our ambitious plans. We are greatly encouraged by the nearly \$22-million in major gifts we raised in 2013-14. Approximately half of this record-setting sum is dedicated to the CEIE.

The impact of these donations is immense. The CEIE will be a physical reminder of the generosity and support of our community, while the significant balance of donations that have been dedicated toward student scholarships will enable many more of our bright and talented future engineers to study free from financial burden. Graduate students will receive funding and support to commercialize their inventions, and facilities will be created that will house state of the art equipment and enable the creation and transfer of knowledge. The generosity of our donors over this past year allows us to continue on our path toward further excellence in research and education.

Infrastructure, well balanced budgets, and revenue generation are essential to proper resource allocation. However, without our talented faculty and staff, nothing would be possible. In order to meet the evolving needs of our growing Faculty, we created a Human Resources office dedicated to Engineering. The office was fully staffed as of fall 2013 and the new team has been meeting with chairs, directors, business officers and managers to assess both the current and future needs of U of T Engineering. As we move forward, we will continue to address the Faculty's professional development and succession planning needs, which is crucial to ensuring top tier support for achieving our mission.

7. RESOURCE ALLOCATION: YEAR 3 PROGRESS HIGHLIGHTS

7.1 Maximize quality academic time and effectiveness by increasing engagement in high value activities that support students' academic experience, contribute to knowledge creation, and advance engineering research frontiers.

- Created senior level administrative support positions to further the mandates of BioZone, UT-IMDI, and the Centre for Water Innovation which has a new focus on sustainable water management for water resource industries
- Marked progress on our long term goal of a 60:40 undergraduate-to-graduate student ratio (currently 72:28), with the aim of optimizing academic time and classroom resources
- Regularly review departmental work load policies

7.2 Place emphasis on Engineering's strategic research areas when considering faculty hires.

- Strategically hired 3 new interdisciplinary faculty members, each cross-appointed in two departments

7.3 Provide a supportive environment for faculty members through mechanisms such as start-up funding, teaching skills workshops, and assistance via Associate Chairs, Research to create successful research proposals.

- Offered lunch time panel series *Best Practices in Research* on topics such as impactful research and the Early Research Award
- Established a peer review or mentorship program in each department to support and guide faculty members in the development of their NSERC Discovery Grants (DGs), Discovery Accelerator Supplements (DAS), and Research Tools and Instruments (RTI) grant applications

- Created workshops, through the Teaching Methods & Resources Committee, on developing learning outcomes
- Relocated and upgraded facilities for the Instructional Technology group to better enable instructors in their design of digital learning objects

7.4 Improve our chances of being awarded funding for capital projects by pre-planning for various opportunities consistent with our goals and suitable for external funding sources such as CFI, Ontario Ministry of Training, Colleges and Universities (MTCU) and other capital grants. Increase the quality and quantity of space particularly through fundraising for new and revitalized buildings.

- Attracted 17 CFI grants that were matched by ORF for a total of over \$3.4-million
- Provided support services in aid of 7 new CFI/ORF grant applications which included infrastructure upgrades
- Raised over \$10-million in support of the CEIE building

7.5 Enhance teaching and design facilities, upgrade undergraduate laboratory space, and make flexible space available for extra-curricular activities.

- Received a \$2-million donation from Bill (ChemE 6T7) and Kathleen Troost in support of the Unit Ops Lab and undergraduate scholarships
- Consolidated student clubs' space at 256 McCaul Street and 701 Spadina Avenue, including all music clubs, establishing a new multi-purpose room for events and rehearsals
- Currently testing new, flexible furniture in Bahen Centre tutorial rooms in aid of design courses
- Through matching from the Dean's Strategic Fund, upgraded the facilities and equipment in the IBBME Undergraduate Teaching Lab
- Upgraded A/V and wireless capabilities in MC 102
- Provided new, mobile flat screens for use in shared meeting rooms
- Renovated SF3201 into a TEAL room to gain experience prior to designing TEAL spaces in the CEIE

7.6 Provide reliable, accessible, effective computing services; create study spaces within and outside computer laboratories, library and classrooms so as to enhance interactive learning and socialization where today's student 'lives'.

- Added 88 student study spaces to the Bahen Centre inventory of hallway seating
- Developed plan for a new 64 seat capacity computer lab in the CEIE building, along with significant informal student study seating in common areas throughout the building
- Initiated a plan to install digital scheduling displays outside all ECF computer labs to provide students with scheduling information for all of the computer labs, identifying opportunities for drop-in use
- Upgraded half (200) of the ECF lab PCs and all (400) of the monitors to high quality 24" LCDs
- Established a new MIE computer lab in the Lassonde Mining Building
- Approved funding for 5 Dean's Strategic Fund proposals to improve design, club, and meeting spaces throughout the Faculty

7.7 Encourage timely degree completion among doctoral stream students; increase research funding and graduate fellowships to support graduate students.

- Decreased the time to completion slightly to 5.2 years (down from 5.3 last year)
- Piloted software tracking system for PhD completion in our ECE department
- Began development of detailed data on time-to-completion, fast tracking and scholarship success rates with the goal of using the data to identify and share best practices, as well as identify problems to be addressed
- Total graduate funding grew by 9.1% in 2012-13; graduate students received nearly \$1-million more in total scholarships during this year

7.8 Establish a strong Case for Support that addresses the Faculty's resource requirements and aligns the Faculty's critical need for improved space in the context of addressing educational and research priorities.

- Received record support with over \$10-million in donations towards the CEIE building, the cornerstone of our Engineering Campaign
- Nearly half of all funds raised in 2013-14 were designated to research, student experience and programs, and student scholarships and awards

7.9 Increase long-term philanthropic support by strengthening the culture of advancement within the Faculty.

- Established the Young Alumni Board, comprised of recent graduates who are recognized leaders in their fields and philanthropic supporters of the Faculty, to engage and involve younger alumni in fundraising and community-building initiatives
- Supported successful fundraising campaigns in Asia-Pacific for nationality named spaces in the CEIE
- Launched our first Faculty and Staff Campaign
- Enhanced the Faculty's philanthropic endeavours and outreach to corporate partnerships through the activities of our directors of corporate partnerships

8. Conclusion

Through our collective efforts as a Faculty and community, we have achieved a great deal together. We have surpassed many of the goals outlined in our Academic Plan and seized opportunities to drive new priorities. These past three years have laid the foundation upon which we will build our future, and that future looks very bright. As we move forward into the final two years of our Academic Plan 2011-16, we will continue to increase our international reputation for excellence, enhance our curricula and student experience, broaden our outreach and influence, strengthen our multidisciplinary and collaborative research endeavours, and invest in a solid infrastructure.